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Joint Commission
National Committee for Quality Assurance
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American Academy of Family Physicians (AAFP)
American Academy of Pediatrics (AAP)
American Association of Colleges of Nursing
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American Association of Preferred Provider
 Organizations (AAPPO)
American College of Healthcare Executives
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American Health Care Association (AHCA)
American Health Planning Association (AHPA)
American Hospital Association (AHA)
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American Osteopathic Association (AOA)
American Public Health Association (APHA)
American Society of Health Economics (ASHE)
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Institute for Healthcare Improvement (IHI)
International Health Economics Association
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National Quality Forum (NQF)
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Business Coalitions

Leapfrog Group
Midwest Business Group on Health
National Business Group on Health (NBGH)
Pacific Business Group on Health (PBGH)

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Commonwealth Fund
Gates Foundation
Kaiser Family Foundation
Kellogg Foundation
Milbank Memorial Fund
Pew Charitable Trusts
Robert Wood Johnson Foundation (RWJF)

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Abt Associates
American Enterprise Institute for Public Policy Research (AEI)
Brookings Institution
Cato Institute
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 U.S. Department of Veterans Affairs (VA)
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About the Editors

Editor-in-Chief

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Introduction

The Field

There is a critical paradox at the very heart of modern healthcare. Today, as never before, healthcare has the ability to save lives and enhance the duration and quality of life. Advances in healthcare such as open-heart surgery, organ transplants, and test-tube babies stand at the forefront of human endeavor. At the same time, however, healthcare has become so enormously costly that it can easily bankrupt governments and impoverish families and individuals.

America is facing a growing healthcare crisis. It spends more money on healthcare, in terms of both total amount and per capita spending, than any other nation on earth. Yet America has a relatively high infant mortality rate and a low life expectancy compared with other industrialized nations such as Canada, the United Kingdom, and Japan. Many of America's hospitals and nursing facilities provide poor-quality healthcare. Medical errors and unsafe conditions are common, resulting in thousands of patient deaths annually. Millions of Americans are unable to access healthcare, especially those without health insurance and those who are underinsured. For many Americans, routine and preventive care is unaffordable. And many who do receive healthcare are unable to pay for it; healthcare expenses are the leading cause of bankruptcy in America. Although politicians, business leaders, health practitioners, and the general public all agree that America's current healthcare system needs to be reformed, there is no consensus on how to accomplish it.

Health services research addresses these and other crucial issues. Specifically, the multidisciplinary field of health services research focuses on

the study of the accessibility, costs, quality, and outcomes of healthcare. Access to healthcare includes everything that facilitates or impedes the use of healthcare services. Cost of healthcare includes the payments by insurers and individuals for healthcare services as well as the cost of lost wages and the societal cost of decreased productivity. Quality of healthcare encompasses elements of the structure, process, and outcomes of healthcare. Outcomes of healthcare include death, disease, disability, discomfort, and dissatisfaction with care. The overall aim of health services research is to improve the equity, efficiency, and effectiveness of healthcare, mainly by influencing and developing public policies.

Rationale for This Encyclopedia

This encyclopedia is needed and timely for three major reasons. First, the field of health services research has grown enormously over the past two decades, with an ever-widening range of topics being studied. Second, the organization, financing, and delivery of healthcare have become increasingly complex. Third, because health services research is highly multidisciplinary, including areas such as health administration, health economics, medicine, medical sociology, political science, public policy, and public health, there is no single extant reference source that captures the diversity and complexity of the field. The *Encyclopedia of Health Services Research* was designed to fill this void. This encyclopedia is the first in the field, and it is one of the largest single works ever published on health services research.

The encyclopedia is designed to be an introduction to the various topics of health services research for an audience including undergraduate students,

graduate students, and lay audiences seeking non-technical descriptions of the field and its practices. It is also useful for healthcare practitioners wishing to stay abreast of the changes and updates in the field and doctorate-level academics seeking a portal into a new specialty area.

Content and Organization

To help the reader navigate the encyclopedia, a detailed Reader's Guide comprising 16 sections is provided. Additionally, there is a list of the entries presented in alphabetical order. The individual entries range in length from approximately 500 words for the biographies of current and past leaders, to 1,000 words for associations, foundations, and research organizations, to 3,000 words for major concepts and topics such as health insurance, risk, and quality of healthcare. Each entry is designed to provide the reader with a basic description and understanding of the topic. Following each entry is a Further Readings and a Web Sites section that can take the reader to the next level.

Although the field of health services is large, the encyclopedia attempts to be as comprehensive as possible without being overly redundant. To accomplish this, all entries include several associated topics and cross-references. In a small number of cases, a topic that was covered in the context of a larger topic did not receive its own entry; in those cases, the smaller topic is listed with a cross-reference to the entry in which it is discussed.

How the Encyclopedia Was Created

The encyclopedia was developed in six steps.

First, leading health services researchers in the United States were invited to serve on the encyclopedia's advisory board. All the advisory board members are prestigious academicians, healthcare managers, and researchers who have published in the field of health services research. Two of the board members, Steven Shortell and Katherine Swartz, were former long-time editors of *Health Services Research* and *Inquiry*, respectively.

Second, the encyclopedia's editors developed a draft list of topic headwords. To make sure the list was as comprehensive as possible, six journals that publish the majority of health services research articles were reviewed for the past 10 years. The

journals included *Health Affairs*, *Health Services Research*, *Inquiry*, *Journal of Health Services Research and Policy*, *Medical Care*, and *New England Journal of Medicine*. The draft list was then reviewed by the entire advisory board, which made a series of additions and subtractions.

Third, the editors and the advisory board identified and invited contributors. The editors also searched the literature to find individuals who published on certain topics and invited them to submit entries. The invited authors ranged from promising young doctoral students to the most well-known luminaries in the field.

Fourth, all the contributors were given basic guidelines and instructions regarding the writing of their entries. In particular, they were encouraged to be as thorough as possible in describing the entire topic area and to write in clear, nontechnical, accessible language.

Fifth, the editor and associate editors then reviewed all the entries and asked the authors for revisions as necessary.

Sixth, the editors finalized the volumes and compiled the bibliography and appendix.

Acknowledgments

This encyclopedia is a testament to the efforts of a large number of dedicated and talented people. First, I would like to thank the advisory board for their time, effort, and encouragement, particularly Lu Ann Aday and Michael Morrissey. I am indebted to the many first-rate scholars and professionals who authored the entries. And, of course, I would like to thank the publishing team at Sage, particularly Jim Brace-Thompson, Carole Maurer, and Laura Notton.

I also appreciate the advice, counsel, and friendship of my current and former colleagues at the University of Illinois School of Public Health: Gary Albrecht, Kendon Conrad, Gregory Finlayson, Sally Freels, Benn Greenspan, Louis Rowitz, and Richard Sewell. Special thanks also go to Kathryn Langley and Jared Lane K. Maeda for their editorial assistance.

On a personal level, I want to thank my wife, Linda, for her unyielding support, and my two sons, Erik and Jason.

Ross M. Mullner

A

AARP

The AARP (formerly the American Association of Retired Persons) is the nation's largest association representing individuals 50 years of age or older. With more than 39 million members, the AARP is an influential advocate at the federal, state, and local levels on public policy issues concerning aging and the elderly, and it is also instrumental in shaping public opinion. The AARP conducts policy research, publishes various reports and several widely circulated popular magazines, and sells various products and services, including life and health insurance, prescription drugs, and travel services.

History

Ethel Percy Andrus (1884–1967), a retired California high school principal, and Leonard Davis (1925–2001), a New York insurance executive, founded the AARP in 1958. Andrus taught in California for many years, becoming that state's first female high school principal. After retiring, she became concerned with the poverty her fellow retired teachers experienced who were living on meager pensions. Davis, with Andrus's encouragement and help, pioneered insurance programs for retirees. He would eventually form the Colonial Penn Group of insurance companies, and he went on to found the Leonard Davis Institute of Health Economics of the University of Pennsylvania.

Before founding the AARP, Andrus established the National Retired Teachers Association (NRTA) in 1947. Andrus's initial goal was to promote her philosophy of productive aging and to respond to the needs of retired teachers. After successfully working with Davis to develop insurance policies for them, Andrus developed other benefits and programs, including an early discount mail-order pharmacy service. With the growing success of the NRTA's programs, thousands of other retirees who were not teachers wanted to obtain them. So in 1958, Andrus and Davis established a new organization open to all retired individuals—the American Association of Retired Persons (AARP). In 1999, the association changed its name to AARP.

Membership

Membership in the AARP is open to any person aged 50 or older. Members need not be U.S. citizens or residents. Most members live in the United States, although about 40,000 members live outside the country. Although most AARP members are retired, more than 40% of its members work part- or full-time, which is why the association shortened its name from the American Association of Retired Persons to simply AARP. The median age of members is 65 years; slightly more than half of the members are women.

Vision, Mission, and Organizational Structure

The AARP is a nonprofit, nonpartisan organization. Its vision is for a society in which everyone

ages with dignity and purpose, and it helps people fulfill their goals and dreams. Its mission is dedicated to enhancing the quality of life for all as they age and to leading positive social change and delivering value to members through information, advocacy, and service.

The AARP is organized into a central headquarters, state offices located in all 50 states, the District of Columbia, Puerto Rico, and the Virgin Islands, and more than 2,500 local chapters throughout the nation. Its national headquarters is located in Washington, D.C., to allow its staff and volunteer leaders access to the federal government. The national headquarters coordinates the activities of the field operations and state offices and supports the initiatives of the local chapters, which are separately incorporated groups that provide members with opportunities to volunteer in their own communities. State chapters identify areas of legislative concern locally and support volunteers and staff as they work toward accomplishing the goals and objectives of the association and its members.

The association has two affiliates: the AARP Foundation and AARP Services, Inc. The AARP Foundation's focus is to lead positive social change to help people aged 50 and older, especially the most vulnerable, by delivering information, education, and direct service to communities and families. Specific AARP Foundation programs include various training programs, free tax preparation and counseling for seniors, and homeowner interests. AARP Services, Inc., is a wholly owned subsidiary of the AARP. It manages a range of products and services made available to the association's members, provides marketing services to the association and its member service providers, and manages the association's Web site. Some of the programs that AARP Services, Inc., manages are Medicare supplement, long-term healthcare, insurance (automobile, life, and homeowners), and member discounts and savings on prescription drugs, eye health services, and eyewear products.

Advocacy Activities

The AARP is the largest advocacy group in America for those 50 years of age and older. Its advocacy activities include monitoring issues

affecting older Americans, taking public positions, and expressing its views to state and national lawmakers and regulatory agencies. The association also undertakes selective litigation in age discrimination, pension, healthcare, economic security, and consumer cases.

To define its advocacy endeavors, the AARP reviews existing data, conducts its own research, and surveys its members to gather information on their concerns and views. The association's board of directors is given the task of discussing and balancing various perspectives. The board hears from experts, elected officials, business and industry representatives, and a special advisory council consisting of 25 volunteers. The council makes recommendations to the board, which then approves federal, state, and local policies. The AARP's top advocacy priorities currently include issues such as health, financial security, independence and long-term care, and consumer protection. The association's lobbying efforts helped the passage of Medicare Part D, the Medicare drug benefit, in 2003. It was also instrumental in stopping changes to Social Security in 2005.

Criticism

Over the years, the AARP has been sharply criticized. Some have criticized the AARP's lobbying efforts, which they believe, in many instances, are geared primarily to advancing the association's business interests. Others have criticized AARP because it derives so much of its revenue from advertising, and selling insurance and other products, accusing the association of acting like a for-profit company. This allegation was taken so seriously that in 1995, Republican Senator Alan K. Simpson of Wyoming, then Chairman of the Finance Committee's Subcommittee on Social Security and Family Policy, held hearings investigating the AARP's nonprofit tax-exempt status. The investigation, however, did not reveal sufficient evidence to warrant revoking its nonprofit status. The association has also been criticized as using scare tactics to frighten its older members to influence their opinions. Last, the AARP has been criticized for assuming it can represent the views of all its very large and diverse membership. Some of its members were disappointed that it supported the passage of the Medicare Part D

drug benefit, which they viewed as being poorly designed, confusing, and complicated.

Ross M. Mullner and Cherie Weinewuth

See also Access to Healthcare; Health Insurance; Long-Term Care; Medicaid; Medicare Part D Prescription Drug Benefit; Nursing Homes; Public Policy; Vulnerable Populations

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- Administration on Aging (AOA): <http://www.aoa.gov>
- American Society on Aging (ASA):
<http://www.asaging.org>
- National Council on Aging (NCOA):
<http://www.ncoa.org>
- National Institute on Aging (NIA):
<http://www.nia.nih.gov>
- United Seniors Association (USA):
<http://www.unitedseniors.org>

ABT ASSOCIATES

Founded in 1965 by Clark Abt, Abt Associates applies scientific research, technical assistance, and consulting expertise to a wide range of issues in social, economic, and health policy, international

development, clinical trials and registries, and business research. The company's staff of more than 1,000 is located in offices in Cambridge, Lexington, and Hadley, Massachusetts; and offices in Bethesda, Maryland; Chicago, Illinois; Durham, North Carolina; New York, New York; and more than 35 project offices around the world.

The company has more than 30 years of experience evaluating the effectiveness and impacts of health programs and policy. Its comprehensive process and outcomes evaluation and expert policy analysis help improve quality of medical care and patient safety, expand access to care, lower costs, and empower consumer choice.

Public and private healthcare initiatives face significant challenges to achieve desired outcomes while managing shifting demands and ever-increasing costs. In addition, policymakers continue to explore new strategies to ensure that people receive appropriate healthcare.

To assist clients as they address these issues, Abt Associates employs a variety of methodologies. It performs complex quantitative evaluations, including analysis of large data sets and statistical and econometric modeling. The company's qualitative evaluation capabilities include conducting focus groups, developing case studies, and reviewing the professional and scientific literature. It specializes in surveying hard-to-reach and vulnerable populations, including people with chronic medical conditions, individuals with disabilities, HIV-positive populations, families of children with special healthcare needs, Medicare beneficiaries, and Medicaid recipients. Abt Associates' capabilities include cost-effectiveness analysis, technology assessment, performance measurement, drug/medical claims analytic file construction and analysis, epidemiological studies, consumer satisfaction evaluations, literature reviews and meta-analysis, and clinical trial design and analysis.

Abt Associates also has expertise and experience in a wide range of domains, including community-based health, maternal and child health, disability and rehabilitation, post-acute care, mental health, health disparities, health outcomes and patient safety, healthcare finance, managed care, and addiction prevention, treatment, and recovery.

Over the years, Abt Associates has analyzed numerous health policy issues, examining the impact of federal and state regulatory policy on

provider behavior and quality of care. The company's health economists and clinicians have developed and refined prospective payment and case-mix reimbursement systems for a variety of provider settings, analyzed the potential impact of new payment policies on healthcare outcomes and expenditures, and evaluated the effect of regulatory change on provider behavior.

Abt Associates works closely with clients to develop evaluation and analysis strategies that provide the information they need to make informed choices. Its skilled, multidisciplinary staff includes health services researchers, clinicians, data analysts, policy analysts, health economists, statisticians, and survey research methodologists who combine technical knowledge and integrated perspectives derived from years of experience. Primary clients include federal and state healthcare and public health agencies, national provider associations, and foundations.

Examples of Health Services Research Projects

Gathering Data on Home Health to Design a New Payment System

Under the Home Health Case-Mix Development Project for the U.S. Department of Health and Human Services' Centers for Medicare and Medicaid Services (CMS), Abt Associates collected a wide range of data from a representative sample of home health agencies. It used this information to develop a model of home health resource use and to design a system of case-mix adjustment for use in Medicare's per-episode prospective payment system.

Determining Appropriate Minimum Nurse Staffing Levels

Abt Associates and its partners assisted CMS with a mandated report to the U.S. Congress on the "appropriateness" of establishing minimum caregiver nursing staffing ratios for Medicare- and Medicaid-certified nursing homes. The first objective of the study was to determine whether minimum nurse staffing ratios were appropriate. The study then examined the potential cost and budgetary implications of minimum ratio requirements.

Evaluating Drug Utilization and Coverage and the New Medicare Benefit

Abt Associates worked with CMS to assess the impact of prescription drug coverage on Medicare expenditures, to address design issues for the evaluation of prescription drug programs, and to analyze the determinants of per capita drug spending for Medicare beneficiaries. In addition, the company surveyed Medicare beneficiaries to assess their understanding of the new Medicare drug plan. Abt Associates is also working with CMS to design a more accurate methodology for estimating the costs of prescription drugs to pharmacies and physicians. Researchers at Abt Associates have also analyzed Medicaid drug expenditures, provided strategic consulting to state Medicaid programs, and designed state-level drug insurance programs for senior citizens.

Evaluating the National Healthy Start Program

The federal Healthy Start program provides comprehensive, community-based, perinatal health services to women, infants, and families in communities with high infant mortality rates. The program's goal is to reduce disparities in birth outcomes by increasing access to and utilization of health services. Abt Associates is working with the Maternal and Child Health Bureau of the U.S. Health Resources and Services Administration (HRSA) to conduct the national evaluation of Phase III of Healthy State. The company is conducting an implementation analysis to assess the success of 96 Healthy Start sites. This 2-year evaluation will result in a detailed look at the effectiveness of these sites and will help guide the program as it moves ahead.

Quality Indicators

Abt Associates and its partners are involved with quality indicators (QIs) development, validation, risk adjustment and analysis, and reporting for CMS and the Agency for Healthcare Research and Quality (AHRQ) as well as for states across various providers, including nursing homes, home health care, hospitals, and health plans. The company has developed QIs for nursing homes, validated the indicators through direct-care observation across a large, multistate sample, and worked with

states and CMS in public reporting. The culmination of these efforts was the selection of the quality measures that are currently publicly reported for all Medicare- and Medicaid-certified nursing homes. The company is developing new home health care measures in anticipation of federal pay-for-performance initiatives and assessing how consumers, clinicians, and discharge planners will use nursing home and home health care QIs to select post-acute providers. The company has worked with state organizations and is working with CMS to assess the best way to display hospital and health plan QIs to support consumer choice. It also supported the development of hospital nursing-sensitive measures and helped design the pilot initiative for public reporting.

Multiple Sclerosis Longitudinal Study

Abt Associates is conducting a 4-year epidemiological longitudinal study of 2,000 adults with multiple sclerosis (MS) for the National Multiple Sclerosis Society. Also, the company is conducting studies examining access to MS therapies and specialists, the characteristics of quality MS mental health services, and the psychosocial impacts of the disease.

Analyzing the Economic Impact of Healthcare Regulations

Abt Associates assisted the U.S. Department of Health and Human Services in analyzing the economic impact of regulations that impose economic burden beyond their benefit. The company conducted a series of town hall meetings across the country to receive public comment about quantifying regulatory burden. It conducted a major review of the literature to evaluate prior research and evidence quantifying regulatory burden. And it conducted a series of expert interviews with providers to gather detailed evidence on the economic burden of regulation in nursing homes, hospitals, physician offices, and other healthcare providers.

Peter Broderick

See also Epidemiology; Health Economics; Home Health Care; Medicare Part D Prescription Drug Benefit; Nurses; Public Policy; Quality Indicators; Vulnerable Populations

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Abt Associates, Inc.: <http://www.abtassociates.com>

ACADEMIC MEDICAL CENTERS

An academic medical center (AMC) is an organization whose mission encompasses emphases on clinical care, research, and education. Typically, it includes the following elements: an accredited medical school, one or more affiliated hospitals in which a majority of the medical staff are physician-faculty members, hospital admissions that are primarily made by physician-faculty members, and an affiliated faculty practice plan that is tax-exempt

under federal law or is part of an exempt organization under an umbrella designation.

Background

The modern structure of the AMC has its roots in the highly critical Flexner Report of 1910, which criticized medical education for its lack of an evidence-based approach and paved the way for the modern, more allopathic approach. There was also a concomitant migration from the “commercial” medical school of the time to formalized programs of medical education. Subsequently, the medical education model was characterized by an academic venue, staffed by scientifically rooted faculty practicing in an associated teaching hospital. The ensuing leap in the caliber of medical education has seen highly complex organizational models and intricate connectivity through the multifaceted mission that characterizes today’s academic medical centers.

Distinguishing Features

AMCs are differentiated from public health systems, community hospitals, and safety net healthcare complexes in large measure due to distinct characteristics that came about with the advent of the AMC model of the 20th century. Additional distinguishing features, combined with the multifaceted mission of the AMC organization, go well beyond the purely academic elements that serve to differentiate AMC. These include the following.

Technology

AMCs are on front lines of emerging technology. They are the environment in which new clinical treatment methods and scientific advances are typically developed. The nature of translational research efforts and the setting in which tertiary and quaternary care is delivered embolden providers to make critical advancements in care; as such, AMCs are the setting where these advances can most efficiently occur. These advances take many forms, including new device development and testing, as well as diagnostic and treatment protocols and surgical techniques. With the scientific rigor

and evidence-based discipline present in this setting, promising clinical developments occur. An example is the discovery of the prostate-specific antigen (PSA), which led to a test that helps detect prostate cancer in men of age 50 and older. AMCs also often curtail the introduction of techniques that are unsafe or lack efficacy. One such example is the Jarvik artificial heart, which was banned when practitioners found that most of the recipients could not live more than half a year.

Prestige

The output of AMCs significantly contributes to the United States’ international presence and prestige. Healthcare is often a source of national pride and economic benefit; thus, advances in science and medicine represent a significant portion of a nation’s economic and political agenda.

Physician Scientists

AMCs are essential to the development of the United States’ base of young scientists. Federally funded programs such as the National Science Foundation’s Science, Technology, Engineering and Mathematics (STEM) program leverage AMCs to encourage the study of science, making these centers important settings for training physician scientists.

Preparedness

Along with federal and local government agencies, AMCs play an integral role in the United States’ preparedness infrastructure for national emergency and terrorism response. Routinely seen as the tertiary- and quaternary-care centers for the country in the event of any number of national health scenarios (e.g., terrorism attacks, epidemics, bioscientific responses), AMCs play key roles in drill scenarios. Without the involvement of AMCs, the nation’s response armamentarium would be substantially less robust.

Challenges

AMCs currently face a number of critical challenges, including environmental factors associated with

healthcare economics, technology advances, changes in the makeup of healthcare professions, regulations, and, increasingly, political forces. Internal structural weaknesses can also arise from internal conflicts associated with the multifaceted missions typical of AMCs, further challenging their viability. There are also influencers that revolve around future revenues and niche competition.

AMCs operate on a costly platform, in part due to their aggressive development and adoption of emerging technology as well as investigational and clinical protocols. The inherent inefficiencies of training clinical practitioners or scientific investigators places further cost pressures on such centers. There is broad recognition that the models under which AMCs operate will face substantial challenges in the years ahead, but a consensus is lacking as to the direction AMCs should take in the future.

On the immediate horizon are corresponding environmental and internal issues that threaten the viability of AMCs and will drive the industry response. Funding sources needed to support direct operating costs, as well as AMCs' associated overhead and infrastructure, are being constrained. Managed-healthcare penetration, along with federal and state-level clinical program revenues (e.g., Medicare and Medicaid), have diminished clinical income streams available to these centers. Increasing debt for medical school graduates is forcing a closer examination of tuition levels. And the percentage of funded National Institutes of Health (NIH) grant applications is declining along with other sources of research funding. Philanthropy, another source of revenues on which AMCs are highly dependent, can be volatile due to a dependence on economic conditions affecting the very wealthy.

In the realm of economic challenges, another high-profile issue is the threatened removal of the not-for-profit tax status of AMCs. Regardless of whether the motive for this threat is to "punish" not-for-profit hospitals for not providing community-based charitable care to a level consistent with the tax benefit received, or to serve as a source of property tax revenues for local government, a change in tax laws creating a substantial tax burden on AMCs could severely affect the mission and sustainability of these institutions.

Additional significant forces are on the horizon, although they are not unique to AMCs. For example, the availability of healthcare personnel is expected to be significantly affected by the aging workforce and declining enrollment in training programs, particularly nursing. In terms of training programs, there has been a trend toward more highly qualified and more costly caregivers (e.g., master of science in nursing, doctorate of pharmacy, doctorate of physical therapy) who are increasingly unwilling to perform traditional tasks associated with previous generations of healthcare professionals. Healthcare professionals, who have in recent years earned high incomes, are an increasingly attractive target for union organizers. If the efforts of these organizers are successful, unionization within AMCs personnel may increase in the coming years. Medical travel, once considered a fairly isolated market force as far as its impact on the healthcare market is concerned, has also begun to draw more attention. International private-pay patients have been an important source of income for AMCs; as international healthcare markets begin to mature, they are increasingly attracting international as well as U.S. consumers of medical services to travel abroad in search of less costly care in a more service-oriented environment. Potential failure of "safety net" hospitals, particularly in urban areas, could overload AMCs because they are a natural alternative to the typical alternative large urban provider of public acute and tertiary care.

Future Implications

Despite the distinguishing characteristics of AMCs and their critical position in our national healthcare infrastructure, these organizations are subject to numerous current and emerging political and economic forces and will need to adapt in order to continue as essential contributors to our nation's health system. AMCs will be pressed to take a proactive approach to counter the negative forces they face entering the 21st century. Their ongoing success will require leadership and continued national recognition for the major role these important institutions play in the support infrastructure of our society.

J. Robert Clapp and Andrew N. Garman

See also Access to Healthcare; Association of American Medical Colleges (AAMC); Flexner, Abraham; Hospitals; Inner-City Healthcare; Physicians; University HealthSystem Consortium (UHC)

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Health Resources and Services Administration (HRSA): <http://www.hrsa.gov>

National Science Foundation (NSF): <http://www.nsf.gov>

University HealthSystem Consortium (UHC): <http://www.uhc.edu>

ACADEMYHEALTH

AcademyHealth (formerly the Academy for Health Services Research and Health Policy) is a non-profit, nonpartisan resource for health services research and policy and the professional home for health services researchers, policy analysts, and

practitioners. AcademyHealth represents nearly 4,000 individual members and 125 affiliated organizations in the United States and abroad. AcademyHealth seeks to improve health and healthcare by generating new knowledge and moving knowledge into action.

Mission

To achieve its mission, AcademyHealth collaborates with the health services research community and other key stakeholders to support the development of health services research by expanding and improving the scientific basis of the field by increasing the capabilities and skills of researchers and promoting the development of the necessary financial, human, infrastructure, and data sources. It also seeks to facilitate the use of the best available research and information by translating research findings and the lessons of experience into useful information for clinical, management, and policy decisions, and enhancing communication and interaction between health services researchers and health policymakers. In addition, AcademyHealth assists health policy and practice leaders in addressing major health challenges by providing high-quality policy and technical assistance by offering educational programs that advance the use of policy analysis and research and identifying areas where additional research and information are needed.

AcademyHealth's work concentrates its efforts and expertise on a variety of issues that are essential to health policy making and practice. These include healthcare financing, organization, and delivery; the problems of the uninsured; the quality and costs of care; public health systems and issues; health information technology; and long-term care.

Background

AcademyHealth was established in June 2000 following a merger between the Alpha Center and the Association for Health Services Research (AHSR).

The Alpha Center was founded in 1976 as a federally funded, regional health-planning center. It evolved into a nonprofit, nonpartisan health policy center dedicated to improving access to affordable, quality healthcare. The Alpha Center

provided expert technical assistance, objective analysis and research, and comprehensive education and facilitation services.

The AHSR was formed in 1981 and was a nonprofit professional society for individuals and organizations committed to health services research. Its mission was to educate consumers and policymakers about the importance of health services research, disseminate information generated by health services researchers, secure funding for the field, and provide networking and professional development opportunities.

To better integrate the development of the field of health services research with the use of research to inform public- and private-sector decision makers, the Alpha Center and the AHSR merged to become the Academy for Health Services Research and Health Policy in 2000. The integration of the two organizations provided a strong foundation for building a bridge between the research and user communities in the world of health policy and practice. A year and a half after the merger, the executive committee began to explore whether the organization's name accurately and effectively conveyed its mission, vision, and values. In 2003, the organization finalized its rebranding process, unveiling its new identity, AcademyHealth, at its 2003 annual research meeting.

AcademyHealth's predecessor organizations were historically at the forefront of the field of health services research, organizing the initial professional meeting of health services researchers in 1983 and working with the academic, policy making, and practitioner communities to provide professional development and networking opportunities. Building on their combined strengths, AcademyHealth provided a home for the growing multidisciplinary field and a vital resource for consumers of the field's research.

As the field of health services research has matured, AcademyHealth has devoted increased attention to developing and supporting the financial, human, and data resources that make up its infrastructure.

Organizational Structure

AcademyHealth is led by a president and governed by a board of directors representing a broad range of experience in academia, clinical practice, and industry. The board of directors of

AcademyHealth consists of 21 members who serve 4-year terms, with 5 members elected each year. Two candidate slates are developed, one for election by the board and one for election by the membership. The board elects two directors each year. The membership elects three. In June, the nominating committee submits the slate of board-elected candidates to the full board for its approval and election. The board also ratifies the slate of member-elected candidates. This slate is presented to the membership for election in September. The board meets twice annually.

Membership

The membership of AcademyHealth is diverse, including public policymakers, business decision makers, health services researchers, policy analysts, economists, sociologists, political scientists, consultants, clinicians, and students. Through journal subscriptions, conferences, professional development resources, and topic-specific interest groups, AcademyHealth fosters networking and professional growth among its members by bringing together a broad spectrum of players to share perspectives, learn from each other, and strengthen working relationships.

Individual and organizational members receive registration discounts for AcademyHealth meetings, complimentary subscriptions or reduced rates for more than 30 health publications, access to online, members-only content on the AcademyHealth Web site, and advocacy through the Coalition for Health Services Research (CHSR).

In 2004, AcademyHealth introduced interest groups, which convene members and nonmembers around focused topics for Web-based discussion forums and annual or biannual meetings. Currently, there are 15 interest groups addressing the topics of (1) behavioral health services, (2) child health services, (3) disability research, (4) disparities, (5) gender and health, (6) health economics, (7) health information technology, (8) health policy communications, (9) the health workforce, (10) the interdisciplinary research group on nursing issues, (11) long-term care, (12) public health systems, (13) quality, (14) research translation, and (15) state health research and policy.

AcademyHealth Reports, the quarterly membership newsletter, provides original articles on

issues affecting the field as well as regular updates on AcademyHealth-sponsored professional development and networking opportunities. AcademyHealth also publishes a monthly e-newsletter for members, *Member Update*, and a quarterly newsletter, *Partners*, comprising updates submitted by organizational affiliates.

Annual Meetings

AcademyHealth hosts two major meetings each year. The first, the National Health Policy Conference, is held each February in Washington, D.C., and offers an in-depth look at key health policy issues for the year ahead. The conference brings together policy professionals, practitioners, and researchers to discuss policy challenges, debate potential solutions, and identify the research needed to inform the policy process.

The second, the Annual Research Meeting, is generally held each June. The meeting brings together researchers from around the world to share and discuss the latest health services research findings, learn new methods, debate policy issues, and network with colleagues. The Annual Research Meeting is a key component of AcademyHealth's efforts to promote and expand the scientific basis of the field. To ensure that the meeting presents top-notch research, AcademyHealth aims to have at least 40% to 50% of the content chosen by peer review. Approximately 50 meetings, large and small, are held in conjunction with the Annual Research Meeting. In addition, AcademyHealth offers timely events and briefings to convene key stakeholders from the public and private sector around critical health issues.

Seminars, Training, and Fellowships

AcademyHealth offers an array of seminars featuring comprehensive training in health services research methods and health policy tools and techniques. Seminars are offered in conjunction with the Annual Research Meetings and the National Health Policy Conference, as well as in smaller meetings and cyber-seminars throughout the year.

AcademyHealth annually offers a 3½-day program, the Health Policy Orientation, for individuals interested in learning how national health policy is

developed and implemented. During this seminar, Washington insiders provide an in-depth introduction to the key players, formal and informal policy-making process, and critical health policy issues. The program includes speakers, panel presentations, group discussions, site visits, and hands-on tutorials.

AcademyHealth also develops full-day, expert-led seminars in health services research methods. These seminars provide a forum for researchers to enhance their academic and professional knowledge base. It also offers courses designed for health policy professionals of all levels. These courses give participants the tools they need to learn how research affects policy decisions and how to use existing data sources to inform policymakers.

In conjunction with the National Center for Health Statistics (NCHS), AcademyHealth offers a health policy fellowship that brings two visiting scholars in health services research-related disciplines to NCHS for a period of 13 to 24 months to collaborate on studies of interest to policymakers and the health services research community using NCHS data systems.

Awards

Each year, AcademyHealth recognizes individuals who have made significant contributions to the fields of health services research and health policy. The Alice S. Hersh New Investigator award recognizes an outstanding early-career professional. The Article-of-the-Year award recognizes the best scientific work that the field of health services research and health policy have produced and published in the previous calendar year. The Dissertation award honors an outstanding scientific contribution from a doctoral dissertation in health services research. The Distinguished Investigator award is presented to an individual who has made a significant and long-lasting contribution to the field of health services research, and the HSR Impact award recognizes health services research that has had a positive impact on health policy and/or practice. In addition, the Student Poster award annually recognizes the best student poster presented at the Annual Research Meeting.

Working to Build the Field

AcademyHealth has undertaken a number of initiatives to strengthen the infrastructure for health services research, including a 2006 environmental scan to survey the perceived needs and expectations of both producers and consumers of health services research. The resulting report, *Strengthening the Field of Health Services Research: A Needs Assessment of Key Producers and Users*, draws conclusions regarding the infrastructure needs and research priorities of the field and suggests immediate and long-term actions to improve the impact of the field's research on health and healthcare.

The survey's findings led to a 3-year initiative to assess, build consensus, and make recommendations on strategies to address the future infrastructure needs of the field of health services research. A trilogy of summits in 2007, 2008, and 2009 will address workforce needs, methods and data, and knowledge transfer, respectively. Each will commission new research, hold a meeting of stakeholders to develop recommendations, and undertake dissemination activities to share those recommendations with key audiences.

In 2006, AcademyHealth convened a Methods Council to assist in the development of strategies for professional development in health services research methods, respond to member-reported needs, and anticipate future needs of the field. The council is made up of leading health services research methodologists who represent a wide range of disciplines and expertise. Council members serve a 3-year term. Subcommittees carry out specific tasks.

The activities of the council include the following: reviewing feedback and requests from members for new methods offerings, assessing the field's current and future needs, selecting topics and faculty for the methods seminars, providing guidance and peer review of methods publications, and providing updates to the board on AcademyHealth's research methods programs.

Among the council's first activities was the creation of a health services research glossary, which is currently on the Internet at the AcademyHealth Web site. It provides an organized, professional resource to help establish a common language and methods for health services research and assist individuals in comparing study methodologies.

These activities supplement AcademyHealth's ongoing work to develop and represent its membership base; provide professional development opportunities for researchers, practitioners, and policymakers; assist in translating research into policy solutions and advocate for the field of health services research; and support funding and authorization for the federal agencies that rely on its research.

Programs and Initiatives

To facilitate translation of research into action, AcademyHealth provides technical assistance to policymakers, researchers, government officials, and business leaders, and it disseminates vital information through research syntheses, special reports and findings, newsletters, and its Web site. AcademyHealth also serves as a program office or contractor for select foundation and government agency programs that complement its efforts to build the field and stimulate demand for this type of research among policymakers and practitioners.

International Exchange

Through its International Exchange program, AcademyHealth seeks to inform U.S. policy making with research and experiences of health systems around the world. The program brings together experts from universities, foundations, and policy centers to provide support that is non-partisan and confidential. Its work includes both AcademyHealth-sponsored initiatives and projects commissioned from outside organizations such as U.S. government agencies, international organizations, and private organizations. This includes activities such as convening expert consultations and workshops; establishing international working groups to define shared research agendas and managing comparative research projects; facilitating contact with U.S. or foreign policymakers, opinion leaders, and researchers; and producing working papers on lessons learned for the United States and other nations.

An example of such efforts is AcademyHealth's Health in Foreign Policy Forum. Held initially in 2005, the forum presents an overview of the many U.S. health policy challenges that have international

implications. Meeting topics have included global commerce and health, disease and international security, and an in-depth focus on U.S. domestic and foreign policy responses to the global shortage of health professionals.

Public Health Systems Research

To increase the visibility of public health systems research among federal and state policymakers, and to incorporate the priorities of key stakeholders, especially practitioners, into the national research agenda, with the aim of strengthening the nation's public health infrastructure, AcademyHealth is engaged in a series of projects aimed at supporting researchers, funding research, and bringing stakeholders together to link research to policy.

National Programs

AcademyHealth is the national office for the Changes in Health Care Financing and Organization (HCFO) and the State Coverage Initiatives (SCI), two national programs of the Robert Wood Johnson Foundation (RWJF). The HCFO program supports investigator-initiated research and policy analysis, evaluation, and demonstration projects examining major changes in healthcare financing and their effects on access, cost, and quality of care. The SCI program provides technical assistance to state policymakers' efforts to maintain and expand health insurance coverage.

Federal Contracts

Under contract to the Agency for Healthcare Research and Quality (AHRQ), AcademyHealth develops and implements long-range strategies to assist healthcare purchasers, health system leaders, and state and local policymakers in applying research-based evidence to policy and program development. Additionally, AcademyHealth and the Cecil G. Sheps Center at the University of North Carolina receive funding from the National Library of Medicine (NLM) to maintain the library's Health Services Research Projects in Progress (HSRProj) database. The database provides access to ongoing grants and contracts in health services research.

Coalition for Health Services Research

AcademyHealth's advocacy arm—the Coalition for Health Services Research (CHSR)—advocates for the health services research community in Washington, D.C. The coalition campaigns for enhanced funding for agencies that support health services research and works to ensure that federal agencies supporting the field continue to receive reauthorization from the U.S. Congress. Some issues for which the coalition has played an instrumental role include easing restrictions placed on researchers by the federal Health Insurance Portability and Accountability Act of 1996 (HIPAA) privacy regulations and maintaining a strong and independent peer-review process for federal grants.

The coalition involves AcademyHealth membership in the federal legislative process and works in partnership with other organizations that support its goals. To broaden support for health services research and health data, the coalition provides organizational support for both the Friends of the AHRQ and the Friends of the Centers for Disease Control and Prevention's NCHS. These "Friends" groups comprise key stakeholders for health services research and health data, including providers, patients, businesses, academic health centers, universities, and health insurance plans.

Kristin Rosengren

See also Agency for Healthcare Research and Quality (AHRQ); Health Services Research, Definition; Health Services Research, Origins; Health Services Research Journals; National Center for Health Statistics (NCHS); National Institutes of Health (NIH); Public Policy; Robert Wood Johnson Foundation (RWJF)

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 Health Services Research Projects in Progress (HSRProj):
<http://www.nlm.nih.gov/hsrproj>
 State Coverage Initiatives (SCI):
<http://www.statecoverage.net>

ACCESS, MODELS OF

Measuring access to healthcare is a central part of health services research and is driven by the commitment to design and evaluate the delivery of health services. However, the task of measuring access to healthcare is often complicated by the lack of agreement regarding what actually constitutes access to care.

The nation's news media often report stories of different aspects of access to healthcare to stimulate interest, including reports on the alarming growth in the numbers of underinsured or uninsured persons; stories of discrimination by healthcare providers; reports of persons who were denied care in hospital emergency departments; and accounts of individuals who were sick but could not see a provider because one was not available. While all these factors are considered access to healthcare, measuring it requires examining the specific interpersonal needs of the individual such as age, gender, race, economics, culture, disability, and sexual orientation, as well as provider issues such as their availability, reimbursement for services, provider liability issues, and commitment to providing indigent care.

Additionally, access to healthcare must take into account cultural competency, language interpreter needs, and organizational issues that affect the continuity of care and delivery of services. Resources, including location of facility, convenience of care in the community, the supply of providers in shortage areas, and public and private financing of care, must also be considered. It also requires defining what part of access to healthcare is being measured; that is, medical care, dental care, mental healthcare, or substance abuse services. The type of provider must also be identified as care physicians, physician assistants, nurses, psychologists, dentists, pharmacists, social workers, physical therapists, or other providers.

To address an issue of this magnitude, it is often helpful to use a model to systematically examine the factors that contribute to obtaining access to healthcare. Models are frameworks that use a theory or set of interrelated principles to explain or predict some aspect of behavior. Models can be used as a guide for determining why persons are or are not gaining access to healthcare. In addition, these models may help us to identify what should be examined in order to assist individuals in gaining access to care.

This entry reviews four models that have been widely used to evaluate access to healthcare: (1) the Donabedian structure-process-outcome model, (2) the Andersen Behavioral Model, (3) the health belief model, and (4) the theory of reasoned action model. This review includes an overview of the key components regarding each model, a discussion of the relationship between the model and access to care, and a brief critique of each respective model.

Models of Access to Healthcare

The Donabedian Structure-Process-Outcome Model

Developed by Avedis Donabedian at the School of Public Health at the University of Michigan in the 1970s, the Donabedian structure-process-outcome model (SPO) was constructed to examine the quality of healthcare. It is also used as a means of examining both the use of medical services and the outcomes of the delivery of services. Since its development, the SPO model has been extensively used to measure health outcomes. This model examines access to healthcare by evaluating the

providers and the organizations that deliver the medical care (the structure of the medical delivery system), the amount of care delivered to the patient by these providers (the process of the medical-care delivery), and the outcomes of the care (death, disease, disability, discomfort, and dissatisfaction).

This model has three key components that are essential to its framework. First, researchers examine the structure of medical delivery by determining the appropriateness of necessary care within its given provisions. Donabedian suggests that patients receive inappropriate care in this situation, especially when providers do not have the appropriate amounts of training and experience to treat them. Next, the process of medical delivery is examined by evaluating the extent to which the patients receive an equitable amount of care according to their medical needs, looking at the health status or severity of illness. Finally, the outcome of the delivery of care is considered by determining the extent to which the care results in an improvement in the patient's functioning.

In evaluating the system of medical delivery and applying the SPO model, one should examine the structure and process of medical delivery; however, one should also emphasize examining the impact of these factors on the outcome of medical delivery. Donabedian suggests that, in addition, one should evaluate the impact of care on a group of individuals by linking up the structure and process of care with the outcome of care. According to Donabedian, one should first examine the impact of the system of medical delivery on the outcome of care by linking the providers, organization of medical delivery, and process of medical delivery to the degree of improvement in the patient's social and psychological functioning. Next, the impact of this system can be examined by linking these to the extent to which the patient is satisfied with the care received. Third, they should be linked to the extent to which the patient's knowledge of healthcare improves, following the treatment of his or her illness. Finally, they should be linked to the extent to which the patient's overall health improves as a result of the care received. On the basis of this model, patients receive appropriate access to care when they are treated by competent providers who deliver services that are comparable in type and volume with those of other competent providers. In turn, this results in an improvement in the outcome of the

health problem (depending on the nature and the severity of the problem).

This model has been used extensively to identify systemwide factors that contribute to the outcome of care. Its benefit lies in providing a framework that can be targeted to the end results of an activity, the use of medical services, satisfaction with services, improved health, and an increase in the number of health years alive or cost reduction. As such, it has been used as a program evaluation tool. At the same time, the limits of the model lie in its lack of information on an individual level, such as patient characteristics that interact with the delivery of services. Thus, it may not work as well as measuring an individual's success in seeking services as it would in mapping out what happens across a program.

The Andersen Behavioral Model

Developed by Ronald M. Andersen at the Center for Health Administration Studies at the University of Chicago in the 1960s, the Andersen Behavioral Model (ABM) was constructed as a measure of the individual and organizational factors that contribute to the use of and satisfaction with medical services. It has evolved since then to include measures of environmental and provider factors that influence access to healthcare. The ABM focuses on examining the predisposing, enabling, and need factors that facilitate access to care. It suggests that equitable access to care may be obtained through the utilization of services as opposed to predisposing and enabling factors. The need for care is reflected by health status.

The ABM has three core components to its framework, including predisposing, enabling, and need factors. In the model, predisposing factors represent those factors that exist prior to any episode of illness such as health attitude; benefits; and social demographic factors such as age, gender, race/ethnicity, marital status, and occupation. In this model, organizational and financing factors serve as the enabling factors that facilitate the use of medical services. Organizational factors include having the usual source of care, a supply of providers, and the availability and convenience of services; financing factors include the availability and extent of health insurance coverage. In the ABM, need factors represent either the patient's subjective assessment of their need for service, such as the

number of disability days, limitations in activities, and perceived health status or an objective measure of the need for care, including a measurement of the severity of a disease.

In the application of the ABM to examining access to healthcare, one is expected to use all three components of the model to measure barriers to the equitable receipt of services. This approach would involve using the predisposing factors as measures of determining the fairness in the delivery of services: Thus, if there were significant differences in access to care by gender, then the medical system would be seen as providing inequitable care. In examining the delivery of care by these predisposing factors, one would also need to account or control for the enabling and need factors. Under this approach, equitable access is achieved when it is determined by the need for services and not by predisposing or enabling factors.

On the positive side, the ABM is widely used in both descriptive and analytical research as a benchmark for examining access to healthcare as it is a robust model from a measurement point of view. On the other hand, earlier versions of the model have been criticized for not adequately measuring the influence of culture and cultural competency and the influence of the political environment on care. It does not take into account the ever-changing world of healthcare financing and organizational policies, as found in managed-care organizations. Some researchers have found the model too cumbersome with its reliance on the need to have data on an array of factors to measure access to care. Finally, some argue that the model lacks the ability to capture aspects of the patient-provider interaction process.

The Health Belief Model

Developed by Godfrey Hochbaum and other researchers at the U.S. Public Health Service in the 1950s, the health belief model (HBM) was constructed as a means of examining factors that led to a onetime change in behavior such as screening or immunization. It was later modified by M. H. Becker to examine the use of medical services. The HBM is now used both as a means to examine the individual's motivation to change some aspect of his or her lifestyle, including diet, smoking, exercise, condom use, and medication use, and to

measure equity in the use of services. The model focuses on examining how an individual internalizes a problem and whether or not it has become a problem that is big enough to warrant immediate action; it does this without considering self-imposed or systematic barriers that may also exist. This assessment usually focuses on examining the individual's perceived susceptibility, severity of illness, benefits, barriers, cues to action, and self-efficacy.

Specifically, the HBM measures six core components: perceived susceptibility by determining the risk of an individual of contracting an illness as a result of not taking an action; perceived severity by assessing how a serious illness may affect him or her; perceived benefits by measuring the degree to which the individual follows a recommended behavior; perceived barriers by measuring the perception of the negative aspects of not taking action; cues to an action by focusing on the trigger events, or prompts, that either heighten an awareness of the importance of an activity or motivate an individual to take action; and self-efficacy by examining the extent to which an individual can successfully execute a given behavior.

When applying the HBM, access is measured by the specific reason for care, such as a visit for immunization or health screening. The observed behavior is studied against the individual factors that traditionally serve as obstacles to seeking care, and the trigger event that led to the action of seeking out care is determined.

The HBM has been widely used as a means to design and implement health educational and health behavior interventions. Its strengths lie in its ability to help map out the direction between an individual's thinking about a behavior and his or her readiness and willingness to change. However, while the model has been widely used to test health behaviors, it has been criticized as not being uniformly used. Some researchers have used only parts of the model and not all the components together. Additionally, some of the components of the model have not been validated or tested. Last, the HBM has also been criticized for not accounting for either normative behaviors or cultural factors.

The Theory of Reasoned Action

Developed by Martin Fishbein and Icek Ajzen at the University of Illinois in the 1970s, the theory

of reasoned action (TRA) is based on the notion that humans are able to rationally think about and respond to behavior based on weighing the costs and benefits of any given action. The key components of the TRA model focus on measuring the subjective norms regarding a behavior, measuring the attitude toward a behavior, and measuring how the attitudes and subjective norms can either lead to the intended act or actually execute some type of behavior.

Under the TRA model, researchers measure the subjective norm by examining what they think is important or what they think others want them to do. This is influenced by their knowledge of the factors that contribute to any given norm. Attitudes toward a behavior are measured by the degree to which an individual agrees or disagrees with a particular behavior. Last, researchers measure behavioral intent by developing and using measures that are closely related to the actual performance of a behavior.

Under the TRA, access to healthcare is considered a function of the consumers' understanding of the importance of seeking out health services and their willingness to follow up with an interest in obtaining care to actually get into the medical system. It assumes that knowing something is important and having a favorable attitude about it is a necessary precursor to obtaining access to healthcare. However, access to care is really reflected by the documentation that a person engages in obtaining care that helps her or him.

Like the HBM, the TRA model has been used extensively to examine a person's willingness to engage in healthy behaviors. This model focuses on the role of knowledge and attitudes in seeking care. Thus, its strength lies in its ability to examine the individual's motivation to seek care. However, most of the applications of the model have been related to examining behavioral intentions rather than to actual behavior. As it relates to access to healthcare, the model has been used more to determine whether or not someone would intend to seek medical care, rather than whether he or she actually obtained care. A second weakness of the TRA is a lack of consideration of the organizational and structural barriers, such as financing and environmental obstacles.

Future Implications

Measuring access to healthcare is a complicated process that requires the use of some organizing framework or model for examining the factors that facilitate entry into the medical delivery system. Four models were presented as examples of frameworks that are currently used to examine access to healthcare. While each of these models has its own strengths and weaknesses, their collective utility lies in their ability to help researchers and policymakers to use indicators for measuring the various components of access to healthcare. This assists in achieving an important objective in health services research—the promotion of theory-driven as opposed to data-driven research. Even if researchers are wedded to a particular model in looking at access to care, it is important to use an organized framework to guide the work. Otherwise, the efforts would just be analyzing the data without some sensitivity to whether or not some of the measures are duplicative or poor measures of a concept. In addition, by using a framework to drive the examination, researchers can add to the knowledge base by discovering how the framework or model can be modified to better measure access to healthcare.

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See also Access to Healthcare; Andersen, Ronald M.; Donabedian, Avedis; Health Insurance; Hospitals; Physicians; Structure-Process-Outcome Quality Measures

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- National Center for Health Statistics (NCHS):
<http://www.cdc.gov/nchs>
- National Conference of State Legislatures (NCSL):
<http://www.ncsl.org>
- Robert Wood Johnson Foundation (RWJF):
<http://www.rwjf.org>

ACCESS TO HEALTHCARE

Access to healthcare can be defined as the opportunity or right to receive care. One of the indicators of access to healthcare focuses on the availability of medical providers and facilities for care. A second set of indicators focuses on the availability of resources to pay for care. A third set of indicators focuses on the use of medical services. These indicators are interrelated to each other, yet they measure different aspects of access to healthcare. This entry highlights the national trends in the availability of medical providers and facilities, trends in the availability of resources to pay for care, and trends in the use of healthcare services.

Access to Medical Providers and Facilities

One of the issues in ensuring access to care is making sure that patients have access to the medical providers they need to see and the facilities they need to go to when they need health services.

Ensuring access to providers and facilities is related both to the distribution of these services and the choices consumers make regarding where to go for care. Without an adequate supply of providers and facilities for health services, patients may have to either delay seeking care or travel long distances to obtain services. This process of finding the right match between the patient, the providers, and the facilities is further complicated by the fact that care at these settings is often provided by a mix of providers, including physicians, nurses, physician assistants, physical therapists, pharmacists, social workers, and psychologists, rather than being provided solely by a physician. However, the physician has been and remains the central component of the delivery of healthcare services, either in an office-based practice or in a hospital-based practice.

Access to Providers

As regards the distribution of providers, one of the long-standing issues in the quest to equitably distribute physicians across the country is determining whether a sufficient number of physicians are being trained to meet the needs of patients. Additionally, consideration must be given to whether these physicians can be encouraged to work in historically underserved geographic areas, such as inner-city and rural areas. In 2004, there were 884,974 practicing physicians in the United States, 81% of whom worked in metropolitan areas, while 19% worked in nonmetropolitan areas. The overall number of practicing physicians has increased during the past two decades: In 1980, there were 443,502 active physicians in the nation. The number of medical school graduates grew by 12% between 1982 and 1998, but the U.S. population increased by 24% during the same time period. The increase in the supply of physicians has not kept up with the nation's population.

Several government policies have been used since World War II to foster the equitable distribution of physicians across the nation. These policies include the federal government offering incentives to states to increase the number of medical students and reducing immigration barriers to international medical graduates, the development and use of a needs-based approach by the Graduate Medical Education

National Advisory Committee (GMENAC) to manage the distribution of physicians, and the recruitment of medical specialists into managed-care organizations in the 1980s to match the expansion in the number of these organizations. Efforts to encourage physicians to practice in underserved areas have been recently complicated by declining healthcare reimbursement rates and increasing malpractice insurance rates. In terms of reimbursement rates, the federal government has traditionally reimbursed healthcare providers at a lower rate for services provided under the Medicaid program than that received from private health insurance companies. As a result, providers who practice in poor communities run the risk of receiving less payment per patient than those medical professionals who practice in other more affluent communities. Additionally, several malpractice insurance crises since the 1970s have discouraged providers from practicing in certain communities or in certain medical specialties, such as obstetrics.

In response to the gaps in the distribution of physicians in underserved communities, physician assistants and nurse practitioners have been given more latitude with regard to the healthcare services they can provide. While this approach may be necessary in poor communities with physician shortages, there are discussions within professional medical organizations regarding the optimal mix of these adjuncts to the physician labor force.

Access to Facilities

In 2004, of all the practicing physicians in the nation, 700,287 provided direct patient care. Of these, 77% worked in an office-based practice, while 23% worked in a hospital-based practice. As such, in discussing the issue of access to physicians, one must also look at medical facilities as a place where services are provided.

Several federal policies have been developed to foster the equitable distribution of medical facilities across the nation. These policies include the construction and expansion of hospitals under the Hospital Survey and Construction Act of 1946, also known as the Hill-Burton Act, and the development of community health centers to provide care for the poor.

The Hill-Burton Act was passed to promote the modernization of nonprofit hospitals in the nation.

In exchange for receiving hospital construction grants, these hospitals were required to provide free care for 20 years to eligible persons unable to pay for healthcare services. The act was later amended to include assistance for construction and modernization of nursing homes, rehabilitation facilities, outpatient facilities, and public and nonprofit health centers. The federal government has used the Civil Rights Act of 1964 to force Hill-Burton hospitals not to discriminate for receiving construction grants. In 2005, there were 316 Hill-Burton-obligated facilities in the nation.

While the Hill-Burton Act led to an increase in the number of healthcare facilities, government regulation, decreasing reimbursement, increased competition, and the growth of managed care during the past decades have led to many hospital closures across the nation. Between 1980 and 2004, the total number of hospitals in the nation, including community and specialty hospitals, declined from 6,959 to 5,759. The majority of closures occurred among community hospitals, which declined from 5,830 to 4,919; similarly, not-for-profit hospitals decreased from 3,322 to 2,967, and the number of state and local government hospitals declined from 1,778 to 1,117. On the other hand, the number of for-profit hospitals in the nation increased during this period from 730 to 835.

Since the initiation of community health centers in 1965, the number of federally funded health centers has grown to more than 1,000. More than one third of the patients seen in these centers in 2004 were Latino; another quarter were African American. The health centers serve as a major source of care for the uninsured and those on Medicaid. While the number of community health centers has increased by 58% between 1997 and 2004, this growth has not kept up with the rising rate of the uninsured during the same period.

Access to Resources to Pay for Care

Like the issue of access to providers and medical facilities for services, access to a means to pay for care continues to play a critical role in ensuring that consumers obtain access to care. Access to resources is a function of both having healthcare insurance and having adequate insurance coverage as the lack of insurance coverage translates

into barriers to getting to see a provider. As noted by the Kaiser Commission on Medicaid and the Uninsured in 2003, 42% of those who were uninsured did not have a regular source of care. In contrast, only 9% of individuals with insurance reported not having a medical home, a provider, or a facility to go to when needing care. Nearly half, 47%, of those who were uninsured had to delay seeing a medical-care provider because of the costs of care, compared with 15% of those who had healthcare insurance.

On the surface, one can address the first issue by simply noting whether or not the consumer can pay for care out of pocket or whether he or she has some form of insurance to pay for care. Public health insurance programs, including Medicare, Medicaid, State Children's Health Insurance Program (SCHIP), Veterans Health Administration, TRICARE, and private insurance can be individual coverage plans or employer-sponsored health benefits that can be used to pay for care. Both the scope of coverage and limitations of services need to be considered, which affect the type of care patients can seek and receive. Types of coverage include preventive care, chronic condition care, outpatient care, inpatient care, long-term care, mental health, substance abuse services, and prescription drug benefits. Similarly, insurance premiums, deductibles, coinsurance, caps on coverage, and exclusions help determine whether an individual has adequate health insurance or not.

With regard to the first issue, the extent of the gap in access to availability of care is usually determined by identifying the number of people who are uninsured at any given point of the year, the number who are uninsured all year long, or the number who were uninsured for more than a year. In 2005, there were 46 million Americans without health insurance coverage at some point during the year, which amounts to about one in five adults. Two thirds of the uninsured are low income, and 8 in 10 come from working families. Poor families are twice as likely as other groups to be uninsured. Latinos and Native Americans are the most likely to be uninsured, followed by African Americans, Asian Americans, and Whites. Adults between the ages of 19 and 34 are more likely to be uninsured than those of other age groups. Historically, employees of small companies are more likely to be uninsured than those who work for large companies.

Recent trends, however, indicate that some large companies have elected to not provide health insurance for their employees, and this practice changes workers' expectations for job-based coverage at large organizations. For example, between 2001 and 2005, the percentage of poor employees who had employer-based health insurance coverage dropped from 37% to 30%, while the percentage of near-poor employees who had employer-based health insurance dropped from 59% to 52%. It should be noted that the number of persons who are uninsured all year is typically less than that of those who were uninsured at any time during the year. At the same time, the number of adults who have some limitations in coverage is often higher than the number of uninsured adults. One of the underlying reasons for the number of underinsured adults is the lack of parity between types of insurance coverage, such as health, dental, substance abuse, and mental health coverage. Because deductibles are traditionally higher for dental, substance abuse, and mental health coverage, patients often delay seeking services and care in these areas.

Use of Services

While the availability of medical providers, medical facilities, and health insurance coverage are critical parts of access to healthcare, it is the actual utilization of medical services that demonstrates the extent to which persons are actually getting to see their provider when they need care. Overall nation trend data on the number of patient visits, including those for ambulatory care, inpatient stays, dental, mental health, and substance abuse services, have shown that the majority of Americans are gaining access to these services and the average volume of visits has increased. For example, 61% of the nation's population made at least one visit to a physician in 1964, while 84% of the population made one visit to a physician in 2002. In 1964, 43% of Americans made at least one visit to a dentist, compared with 65% in 2002. Additionally, hospital admissions grew from 11 per 100 persons in 1964 to 12 per 100 persons in 2002. The average number of physician visits for Americans per year increased from 4.9 in 1964 to 5.6 visits per year in 1996. In 1987, there were 3.2 visits to a psychotherapist per 100 persons. This rate remained unchanged in 1997.

Between 1992 and 1999, significant increases in hospital emergency department use were noted among persons 55 to 64 years of age and unemployed adults. During this time period, the volume of emergency department visits increased from 89.2 million to 102.8 million annually. This increase was a result of more illness-related visits as opposed to injury-related visits. There were an estimated 85 million visits made to outpatient departments in 2004. In 2003, federally qualified health centers (FQHCs) reported 50 million patient encounters for 12 million patients. Of these patients, 90% had incomes below 200% of the federal poverty level (FPL), 39% were uninsured, and 64% were of an ethnic or racial minority.

Future Implications

The availability of healthcare providers and facilities and the availability of resources to pay for care and the utilization of services are interrelated measures of access because they reflect the complexities of obtaining care. For example, having a regular provider is seen as important because a well-synchronized provider-patient relationship can lead to appropriate utilization. Having a provider in itself, however, does not equal medical utilization, but it can lead to effective medical use. The same can be said for having a means to pay for care. While having healthcare insurance is not the same as using healthcare services, it alleviates some of the barriers to obtaining care when needed. Today and in the near future, access issues are important because of the large and growing number of uninsured and the continuing maldistribution of physicians.

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See also Access, Models of; Health Disparities; Health Literacy; Inner-City Healthcare; Rural Health; Transportation; Uninsured Individuals; Vulnerable Populations

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Bureau of Health Professions (BHPr): <http://bhpr.gov>

Centers for Medicare and Medicaid Services (CMS): <http://www.cms.hhs.gov>

Henry J. Kaiser Family Foundation (KFF): <http://www.kff.org>

National Center for Health Statistics (NCHS): <http://www.cdc.gov/nchs>

Robert Wood Johnson Foundation (RWJF): <http://www.rwjf.org>

ACCREDITATION

Accreditation is a voluntary process through which healthcare institutions and programs are held accountable for meeting quality requirements or standards. Accreditation involves a rigorous evaluation carried out by an external independent accrediting organization. When healthcare institutions and programs gain accreditation, such accreditation can be viewed as an endorsement resulting from having met the identified requirements. While accreditation is voluntary, it may be required or accepted in lieu of other requirements to be deemed eligible for participation in government healthcare plans and funding. For example, the federal Centers for Medicare and Medicaid Services (CMS) requires

that companies participating in Medicare Part D prescription drug coverage have approved accreditation.

History

The accreditation of healthcare institutions originated in the United States in the early 20th century. In 1917, the American College of Surgeons set up a program of standards to define suitable hospitals for surgical training. This eventually developed into a multidisciplinary program of standardization, which in 1951 led to the establishment of the independent Joint Commission on Hospital Accreditation. Over time, that organization, which today is the Joint Commission, has greatly expanded its focus, and it now accredits 10 types of institutions and programs, including the following: ambulatory care; assisted living; behavioral healthcare; critical access hospitals; home care; hospitals; laboratory services; long-term care; networks; and office-based surgery.

Although the Joint Commission is the largest healthcare accrediting body in the nation, many other accrediting organizations have been established that accredit many types of healthcare institutions and programs. For example, the American Osteopathic Association's Healthcare Facilities Accreditation Program (HFAP) accredits acute-care hospitals and hospital laboratories; the National Committee for Quality Assurance (NCQA) accredits health plans, managed behavioral-healthcare organizations, managed-care organization, preferred provider organizations, and disease management programs; and URAC (formerly known as the Utilization Review Accreditation Commission) accredits many institutions and programs, including case management, claims processing, disease management, drug therapy management, and pharmacy benefit management. Most accreditation organizations are nonprofit tax-exempt organizations.

The past several decades have also witnessed the establishment of many healthcare accreditation organizations across the world. The number of such organizations has doubled every 5 years since 1990. For example, there are now 11 healthcare accreditation organizations in various European

nations. The Joint Commission has also established an international division (Joint Commission International) to accredit institutions and programs outside the United States.

Accreditation Process

The accreditation process often begins with a self-assessment by the applicant institution or program. This is followed by an on-site visit by a survey team from the accrediting organization. The survey team often consists of a multidisciplinary group of healthcare professionals. During the survey process, the team may visit various units of the institution, and they may conduct interviews with leaders, professional staff members, and others. A detailed report of the findings from the survey visit and any recommendations for improvements are presented to the institution. Finally, if the institution or program demonstrates that it meets the agreed standards, it is awarded accreditation.

It is customary for applicant institutions and programs to put substantial effort into the preparation for accreditation. To help with the process, accrediting organizations often provide or sell materials and consultation services to help prepare the institutions and programs for the impending evaluations.

The survey teams use specific standards to evaluate the institutions and programs. Usually developed by the accrediting organization, these standards work in tandem with accreditation, as they are the benchmarks relied on in the accreditation process. The standards are revised and updated on an ongoing basis to reflect the most current understanding of processes, procedures, and structures that result in improved healthcare outcomes and performance. Previously standards were often conceptualized as minimum requirements; today, however, the standards reflect optimal achievable levels of quality.

Accreditation is typically awarded for a limited period of time. This enables the periodic evaluation of the applicant institutions and programs, and it enables standards to be updated to reflect the latest research findings and guidelines to be enacted by the accrediting organizations. For example, Joint Commission accreditation is awarded for a period of 2 or 3 years, depending

on the type of organization or program (2 years for laboratory accreditation, 3 years for all others). Starting in 2004, however, the Joint Commission introduced a Periodic Performance Review component requiring some accredited institutions and programs to demonstrate continuous compliance.

Benefits and Limitations

Benefits of accreditation of healthcare institutions and programs include the following: the greater standardization of policies, procedures, and records; improved measurement of clinical and nonclinical indicators; improved quality of care and services; improved patient safety; increased marketability to the public and prospective workforce; decreased liability expenses; eligibility to participate in certain government programs; satisfaction of certain government reporting requirements; and compliance with certain mandated regulations.

Limitations of accreditation include inconsistencies between applicable regulations and accreditation requirements, the high costs associated with maintaining accreditation, and mixed findings from research on the efficacy of accreditation.

Future Implications

The increasing trend toward the accreditation of healthcare institutions and programs demonstrates a commitment to quality. Through the increasing reliance on outcome-based methods of quality improvement, the efficacy of accreditation is beginning to be understood. Studies have shown some promising findings, but the literature reports mixed findings on many measures of improvement related to healthcare accreditation, and more research is needed. Though accreditation is not mandatory, it is becoming increasingly critical to healthcare institutions and programs.

Paul J. Erickson

See also Joint Commission; Medical Errors; National Committee for Quality Assurance (NCQA); Outcomes-Based Accreditation; Patient Safety; Quality of Healthcare; Regulation

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ACTIVITIES OF DAILY LIVING (ADL)

Activities of daily living (ADL) are actions performed on a daily basis to maintain personal hygiene and carry out basic activities of living independently. Measuring ADL constitutes an important element of health research programs and interventions targeting both the elderly and people with disabilities. Originally developed by Sidney Katz in the late 1950s, the Index of Independence of Activities of Daily Living, or Index of ADL, is one of the oldest and most widely used health measures. Over the years, Katz's system has been modified and expanded.

Types

Activities of daily living are broadly classified into two categories: (1) basic activities of daily living (BADL) or personal activities of daily living

(PADL) and (2) instrumental activities of daily living (IADL). A recently created third category, advanced ADL, includes activities related to occupation, recreation, and community interactions. ADL and IADL are self-reported, while advanced ADL is assessed on a case-by-case basis in clinical settings.

BADL are eating (i.e., using eating utensils, drinking), personal grooming (i.e., washing face, brushing teeth, cutting toenails, brushing hair, shaving, and bathing), using the toilet, ability to transfer from a chair to bed and to a toilet, sitting and rising from a chair, getting in and out of bed, walking inside the residence, stair climbing, being able to lift 10 pounds, and continence of bladder and bowels.

IADL are more complex and require greater concentration, skill, and coordination, such as using the telephone, driving, grocery shopping, preparing meals, doing light housework (i.e., light cleaning, straightening up), doing heavy housework (i.e., scrubbing floors, washing windows), laundry, and managing medications and finances.

Differentiating between BADL and IADL may not be possible due to differences in gender, age, and sociocultural perceptions of the variables under consideration. Performing ADL is important as it engenders self-esteem and helps individuals maintain a place in society as a parent, employee, friend, and community member. Difficulty performing ADL is most commonly a function of aging but can also be due to injury, congenital disorders, stroke, surgery, or chronic disease.

Scoring

ADL parameters are an important tool in the area of biopsychosocial medicine for evaluating functional impairments and quality of life in the disabled, elderly, and chronically ill. Katz formulated the first scoring system for ADL in 1963, and M. Powell Lawton developed an index for scoring IADL in 1969, but many additions and modifications have led to a number of scoring systems that measure a range of variables. While most scoring systems are based on the original Katz and Lawton indexes, no system is used universally. A variety of ADL and IADL scoring systems are used in geriatrics, psychiatry, and rehabilitation programs for

functional assessment protocols to assess the need for home, long-term, or nursing home care and hospitalization.

Functional Disability

Functional disability is a limitation in the performance of tasks of daily living such as maintaining personal hygiene and living independent of family or outside help. Functional impairment is not a uniform construct; it is multifaceted and can be measured with various clinical instruments. Functional status is an important determinant of self-rated health in the elderly. Independence in IADL is determined by physical ability as well as the environmental and cultural surroundings of the individual.

Worldwide, ADL decrease steadily with age. People with multiple chronic conditions such as cancer, diabetes, heart disease, arthritis, and Parkinson's disease are more likely to move from complete functionality to impairment in ADL than are those with a single condition or without disease. Cognitive problems in older adults are predictive of a decrease in functional ADL, while depression is predictive of changes in both ADL and IADL. ADL functioning is positively associated with being male, having daily contact with relatives and close friends, receiving home care, having a higher socioeconomic status, and belonging to a White culture. Though changes in functionality may be reversed with timely intervention, changes in IADL are rarely reversible.

Aging and Public Policy Issues

Although people of all ages may have difficulty performing ADL, prevalence rates rise sharply with advancing age and are considerably higher for those 85 years of age or older. ADL rating scales often classify older people as independent or dependent in self-care activities. However, with this type of classification system, little information is available on independent individuals who report some difficulty in performing self-care activities. It is standard practice to include an ADL index as a variable in public health and clinical research studies on the elderly.

Evidence shows that these measures of maintaining functionality are reliable indicators and predictors in clinical evaluations as well as in policy planning at all levels of elderly care. ADL scores are significant predictors of nursing home admissions, use of hospital and physician services, living arrangements, insurance coverage, and mortality. An increasing number of private long-term care insurance policies rely on ADL measures to establish eligibility for benefits. Public insurance programs such as Medicare and Medicaid also use ADL scores extensively to establish criteria for long-term care. IADL scores usually assess the need for home care, while compromised ADL measures determine the need for nursing home admission. Nationally, one in two residents needs help with three or more ADLs, compared with three in four nursing facility residents. A more impaired residential-care population is likely the product of complex interactions between state-level (licensing, reimbursement, etc.), facility-level (organizational characteristics and service capacity), and individual-level (resources, functional status, etc.) factors. In general, about two thirds of people who receive long-term care live in the community, while the other third live in an institutional setting. For every older adult living in a nursing home, there are two living in the community, often in a family setting, who may need equal levels of assistance.

Karen E. Peters

See also Acute and Chronic Diseases; Chronic Care Model; Disability; Katz, Sidney; Long-Term Care; Nursing Homes; Public Policy; Quality of Life, Health-Related (HRQOL)

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<http://www.geron.org>
- National Center for Health Statistics (NCHS):
<http://www.cdc.gov/NCHS>
- National Quality Measures Clearinghouse (NQMC):
<http://www.qualitymeasures.ahrq.gov>
- U.S. Social Security Administration (SSA):
<http://www.ssa.gov>

ACUTE AND CHRONIC DISEASES

Healthcare providers, public health professionals, and health services researchers classify diseases in various ways. Some use general classification schemes, while others use more specific schemes. Diseases may be classified by their cause (e.g., bacteria, viral), whether they are communicable or noncommunicable, and whether they are infectious or chronic in nature. Infectious diseases may be further classified by their specific mode of transmission, incubation period, and portal of entry into the body. Chronic diseases may also be further classified by which organ system in the body is affected, disease outcomes, and types of intervention. Other schemes classify diseases into whether they are congenital and hereditary, allergies and inflammatory, cancer and neoplastic, metabolic, or degenerative and chronic in nature.

Many of the various disease classification schemes often overlap, and there is no single

“right” or perfect way of classifying diseases. However, one of the most commonly used schemes of classifying disease is to divide them into two broad categories: (1) acute and (2) chronic disease.

Meaning of Acute and Chronic Disease

Throughout recorded history, diseases have been classified by different means and classification schemes. What we now think of as acute and chronic diseases have been documented by the primitive hunter-gatherers of 10,000 years ago and in ancient civilizations from 6,000 years ago in Egypt, Mesopotamia, and the Indus Valley. The etymologic basis for the words *acute* and *chronic* is from the Latin. The word *acute* originates from the Latin *acutus*, meaning sharp or to sharpen. Over the years, the term has been applied to disease states and has taken on three parameters: conditions (1) of short duration, (2) of rapid onset, and (3) of severity. In contrast, the word *chronic* is derived from the Latin *chronicus* and means continuous or constant. Chronic diseases are conditions that are of long duration, slow onset, and less severity. Some expectations of chronic diseases are that they cannot be cured and they do not spontaneously resolve or disappear.

The early designation of a disease as acute or chronic was based on its duration. Although no actual time frame was designated, one thought of acute disease in terms of days or weeks, whereas chronic disease was thought of as lasting months, years, or for an entire lifetime. The National Center for Health Statistics (NCHS) now uses 3 months as the dividing line. Acute diseases are conditions lasting less than 3 months, while chronic diseases are conditions lasting for more than 3 months. However, it is important to note that the terms *acute* and *chronic disease*, and their use, vary in medicine and public health.

There is also a wide range of definitions of the words *acute* and *chronic*, depending on the audience questioned. For example, if you ask people in the general public what terms come to mind when you say the words *acute* and *chronic*, for *acute* they frequently say acute angle, acute shortage, acute sense of smell; and for *chronic* they say chronic complainer and chronically late. If you ask people in healthcare and public health what terms

come to mind when you say *acute disease*, they say acute abdomen, acute pain, and acute respiratory disease; and for *chronic disease* they say chronic cholecystitis, diabetes, and cancer.

The current standard for classifying diseases as acute or chronic is the *International Classification of Diseases* (ICD), now in its 10th revision (ICD-10). Originally published in the 1850s, the ICD was taken over by the World Health Organization (WHO) in 1948 and has become the standard for international diagnostic classification.

Why Definitions Are Inadequate

Epidemiology texts often tend to simplify the difference between acute and chronic diseases by stating that acute diseases are caused by pathogenic microorganisms, whereas chronic diseases are caused by lifestyle, certain behaviors, and the environment. While they are often true, these are not hard and fast definitions and are incorrect in many cases. Many diseases are not even defined using these terms. The term *chronic* is sometimes commonly used in some disease areas, such as cancers of the circulatory system and diseases of the heart, but absent when describing other types of cancer. In many cases, diseases will have acute phases but become quiescent or go into remission in between. Some infectious diseases are remittent in nature or have clinical and subclinical phases.

Disease Statistics and the Study of Morbidity and Mortality

The concept of classifying diseases has, at its roots, the collection of health information from populations. Collection of statistical information by sites was well-known in Florence and Venice in the 1300s, but not as a tool for analysis of health problems. John Graunt (1620–1674) analyzed the causes of death recorded in London’s Bills of Mortality. In 1662, he published the results of his analysis in *Natural and Political Observations Made Upon the Bills of Mortality*. He created the concepts of life expectancy and life tables, and he divided causes of death as being acute or chronic. In 1796, Per Wargentin (1717–1783) published the first mortality tables for an entire country, in this

case Sweden. William Farr (1807–1883), the registrar general in England, was responsible for developing the first modern vital statistics system. A very important observation made by Farr was that diseases, especially chronic diseases, seemed to involve many factors or a multifactorial etiology.

Pioneers in advancement of epidemiology and an understanding of disease in the United States were Lemuel Shattuck (1793–1859), who in 1850 reported on sanitation and public health problems in Massachusetts, and Edgar Sydenstricker (1881–1936), who in the early 1920s advanced the study of disease statistics. The ability to define diseases as acute or chronic depends on a complete understanding of the cause or etiology of these diseases and their morbidity and mortality.

The Role of Microbes in Chronic Disease

Through the nation's media, the general public is increasingly aware of human papillomavirus (HPV), a group of viruses that are sexually transmitted. There is an association of this virus with cell changes that may lead to cervical cancer. In fact, a new vaccine is available that will immunize individuals against HPV. The Advisory Committee on Immunization Practices (ACIP) had recommended to the U.S. Centers for Disease Control and Prevention (CDC) that the vaccine be given to 11- to 12-year-old girls and also recommended it for 13- to 26-year-old females who have not yet received or completed the vaccine series.

Other chronic diseases once thought to be due primarily to lifestyle factors, such as peptic ulcer disease, have been shown to be associated with microorganisms. It seems that most peptic ulcers are caused by *Helicobacter pylori* infection, which can be treated with antibiotics. A report by the American Academy of Microbiology lists more than 40 other diseases, including schizophrenia and Alzheimer's disease, that may have a microbial cause.

Acute and Chronic Concepts and Cancer

In general, cancer is considered a chronic disease. However, some cancers can be considered acute, if they progress rapidly enough. An example is acute myeloid leukemia. This is a condition in which

there are too many immature blood-forming cells in the blood and bone marrow. If untreated, it progresses rapidly. If treated, it may be forced into remission or become recurrent in nature.

Although cancer is considered a chronic disease, some cancer victims are said to be cured if their cancers do not recur or metastasize after specific lengths of time. In other words, there is no difference in causes of death in the "cured" population as compared with those who never had that cancer. Examples would be testicular cancer, Hodgkin's disease, and many types of leukemia. However, in some types of cancers, such as cancers of the lung, colon, breast, and prostate, there can be recurrence many years or decades after the original cancer. In this case, the cancers are treated and controlled.

Although it is assumed by most that cancer is a chronic disease because of the time frame involved and because in the past there was seldom a cure, it is interesting that the term *chronic* is not usually associated with cancer. In certain circumstances, the word *acute* is associated with cancer, such as in acute myeloid leukemia and acute lymphocytic leukemia. But this is not generally the case. In part, this appears to be due to the fact that there are many types of cancers, that it is such a complex set of diseases, and that each individual with the various types of cancers responds differently to treatment.

Mental Illness as a Chronic Disease

The terms *acute* and *chronic* are not often used in describing mental illness. Perhaps because mental illness is so poorly understood, often stigmatized, and underfunded, it has escaped the more typical disease classification schemes. Recently, mental illness has taken on major significance, especially since the World Bank and the World Health Organization Global Burden of Disease report was published in 1996. The report created three scenarios for what illness and disability would look like in 2020. In all three scenarios, unipolar major depression, alcohol use, and dementia ranked in the top 10 causes of illness and disability. In addition, 6 of the top 10 causes of disease and disability listed by the Organization for Economic Co-operation and Development (OECD) are mental illness.

The Three Epidemiological Revolutions

The United States and other advanced nations have gone through three epidemiological revolutions, which have shifted attention and concern from acute, infectious diseases, to chronic, degenerative diseases, to the cultural and socioeconomic causes of disease. The first epidemiological revolution began in the late 1800s and early 1900s. At that time, acute infectious diseases such as pneumonia, tuberculosis, and diarrhea were the main causes of death. Public health methods such as increased sanitation (e.g., sewage systems) and immunizations eventually led to the significant decline of these diseases. The second epidemiological revolution began in the mid-20th century. At that time, with the dramatic decline of acute infectious diseases, chronic degenerative diseases such as cancer, heart disease, and stroke became the main causes of death. The third epidemiological revolution began in the late 20th century. At that time, there was a realization that many diseases and societal problems arose because of poverty, prejudice, and changing cultural issues. Public health would now attempt to address the problems of violence, drug abuse, and teenage pregnancy.

Difference in Societal Perceptions of Acute and Chronic Diseases

There is no firm line between those diseases that are termed *acute* and *chronic*. Acute diseases may become chronic as new treatments and therapies are developed to maintain patients with a disease, or the disease itself may change into a form that is longer lasting or recurrent in nature. One example is HIV/AIDS. In the 1980s, HIV/AIDS was an acute disease that, once diagnosed, would kill rapidly through causing opportunistic infections. Since the early 1990s, with the development of powerful antiviral drugs, HIV/AIDS has become a chronic disease.

Cultural and societal biases may also help define acute and chronic disease. Beyond the time frame usually used to differentiate acute from chronic disease, our culture and society tend to approach acute diseases as if in war, saying that “viruses invade, bacteria attack, and parasites infest.” We also tend to describe treatment as consisting of

“killing bacteria, or battling an infection.” In contrast, we do not describe chronic diseases in terms of war but in terms of management. For example, physicians often encouraged their patients to daily manage their diabetes and hypertension. Furthermore, most chronic diseases have some level of stigmatization associated with them, with HIV/AIDS being the prime example.

James C. Hagen

See also Disease; Epidemiology; Farr, William; Infectious Diseases; International Classification of Diseases (ICD); Morbidity; Mortality; National Center for Health Statistics (NCHS)

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<http://www.cdc.gov>
 National Center for Health Statistics (NCHS):
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 World Health Organization (WHO): <http://www.who.int>

ADAY, LU ANN

Lu Ann Aday is a health services researcher who has spent much of her academic career studying the indicators and correlates of health services utilization and access to healthcare. She has conducted a number of major national and community health surveys, and evaluations of national demonstration projects, and she has published many scholarly articles and books addressing the conceptual and empirical aspects of health services research on access to healthcare.

Born and raised in the small Texas town of Waxahachie, Aday received her bachelor's degree in agricultural economics from Texas Tech University in 1968. She then went to Purdue University to study and earned a master's degree in sociology in 1970. After completing her master's degree, she joined Volunteers in Service to America (VISTA) and served in a poor rural county in Georgia. This experience motivated her to carry out health services research on the access to healthcare for vulnerable populations. She completed her doctorate in sociology at Purdue University in 1973.

After completing her doctorate, Aday began her academic career as a research associate at the Center for Health Administration Studies (CHAS) at the University of Chicago. At CHAS, she worked closely with the noted health services researchers and medical sociologists Ronald M. Andersen and Odin W. Anderson. Aday later became senior researcher and finally associate director for research at the center. In 1986, Aday left CHAS to become an associate professor at the University of Texas School of Public Health. In 1991, she was appointed professor at the University of Texas Health Science Center at Houston, School of Public Health, Health Services Organization. In 2001, Aday became the Lorne D. Bain Distinguished Professor at the school.

Aday has published a number of books. Many of them have been published as second and third

editions, including *At Risk in America: The Health and Health Care Needs of Vulnerable Populations in the United States*; *Designing and Conducting Health Surveys: A Comprehensive Guide*; and *Evaluating the Healthcare System: Effectiveness, Efficiency, and Equity*.

Aday has served on many multinational, federal, and state boards, commissions, and committees, including the Institute of Medicine, the Agency for Healthcare Research and Quality (AHRQ), the national Institute of Medicine (IOM), and the National Cancer Institute (NCI).

During her academic career, Aday has received numerous awards and honors for research and teaching. She was inducted as a member of the IOM of the National Academy of Sciences in 1998. She received the John P. McGovern Outstanding Teacher Award in 1993 and the Minnie Stevens Piper Foundation Award for Teaching Excellence in 2000. And she received an honorary doctorate of social sciences from Purdue University in 2004.

In terms of her future research, Aday is planning to examine the perspectives, principles, and policies that would be encompassed within the field of population health ethics, in contrast to clinical medical ethics and public health ethics.

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See also Access, Models of; Access to Healthcare; Andersen, Ronald M.; Anderson, Odin W.; Health Surveys; Measurement in Health Services Research; Medical Sociology; Vulnerable Populations

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University of Texas School of Public Health:
<http://www.sph.uth.tmc.edu>

ADMINISTRATIVE COSTS

Administrative costs stem from resources used to manage or administer an organization. While they are common to all organizations, administration costs are of particular importance in the U.S. healthcare sector because of the complex nature of health services and the interaction between public and private insurers and providers of care. Another indication of the importance of administrative costs is that virtually all proposals for reforming the U.S. healthcare system include reducing the administrative burden as a key component. It is essential to note, however, that administrative costs are not always negative. Even the most efficient and productive organization must incur a certain level of administrative costs. The challenge is to eliminate only administrative costs that are wasteful or unnecessary. Specifically, this entry defines administrative costs, discusses the magnitude and types of administrative costs, and reviews health policy issues related to administrative costs.

Definition

Organizations produce outputs, which are goods and services sold to individuals or other organizations. For example, a hospital produces services such as cardiac care or orthopedic surgeries. In producing these outputs, organizations use inputs, which are resources such as labor, capital, and supplies. A hospital, for example, uses nursing care, medical supplies, equipment, and facilities to provide cardiac care. An organization's costs depend on the quantity of inputs used and the price of the inputs. Nursing costs, for instance, depend both on how many nurses are employed and on the wages they earn.

Costs can be categorized as direct costs or indirect costs. Direct costs can be linked precisely to a given output. For example, direct costs for cardiac care in a hospital would include nursing salaries,

medical supplies, and equipment for the cardiac-care unit. Indirect costs, then, are the remaining costs, which are more general in nature. The cost of utilities for the cardiac-care unit, for instance, cannot readily be distinguished from the cost of utilities for the orthopedic surgery unit or the intensive-care unit.

Administrative costs and support costs are the two main categories of indirect costs. Administrative costs stem from the managerial activities that are necessary for an organization to operate effectively, while support costs arise from other general activities needed for the smooth functioning of an organization. In a hospital, for example, costs of the human resources and quality assurance departments and salaries of upper management would be classified as administrative costs, while support costs would include expenses for facilities maintenance and housekeeping services.

Magnitude

Administrative costs in the nation's healthcare sector are substantial. At the broadest level, healthcare organizations can be categorized as being either providers of patient care or insurers. Healthcare providers include hospitals, physician practices, nursing homes, home health agencies, and many others. Insurers include public programs, such as Medicare and Medicaid, and many private insurers, such as Blue Cross and Blue Shield. Organizations in the healthcare sector incur numerous costs stemming from the complex nature of health services, the fragmented payment system, and the extensive regulation of health services.

On the provider side, administrative costs account for a considerable proportion of total costs. For example, administrative costs for hospitals and physician practices typically account for approximately 25% of total costs, while the percentage of total costs going to administrative costs in nursing homes is usually of the order of 20%. Using estimates of health expenditures from the Centers for Medicare and Medicaid Services (CMS), administrative costs in the nation's hospitals were of the order of \$150 billion in 2005, while for physician practices and nursing homes, administrative costs were about \$100 billion and \$25 billion, respectively. Another way to measure the magnitude of administrative

costs for providers is to examine the percentage of employee time spent on non-patient-care activities. Case studies indicate that in hospitals, for example, as much as 30% of staff time is devoted to documentation and recording, with more routine management activities, such as budgeting and supervision, accounting for about 7% of staff time.

For insurers, administrative costs typically are measured as a proportion of premiums and range from about 5% for Medicare to 10% to 12% for private insurers. However, estimates for Medicare and other public programs typically exclude important components of administrative costs, such as the costs of Medicare peer-review organizations and other quality-reporting requirements. Moreover, estimates using data from the national health accounts calculate the net cost of private insurance as the difference between premiums received and claims expenditures, the resulting residual including taxes and profits, as well as actual administrative costs. In addition, comparisons between public and private insurers do not take into account the fact that private health insurance plans, which are voluntary, must incur marketing costs to attract customers. Public insurance programs such as Medicare, on the other hand, are mandatory for the most part and do not encounter the same level of expenses for marketing and promotion. Finally, even comparisons across private insurers are complicated by variations in an insurer's mix of small and large employer groups and differences in methods of reporting administrative costs.

Types of Costs

In examining types of administrative costs, it is again useful to distinguish between providers of patient care and insurers. Researchers have proposed a framework for analyzing provider administrative costs, using three categories: (1) operational, (2) payer-related, and (3) regulatory costs. Operational administrative costs, which are common to all organizations, stem from management activities related to human, financial, and facility resources. To operate effectively, an organization must use resources to hire and manage staff, to set budgets and pay bills, and to purchase and maintain the plant and equipment.

The other two categories of provider administrative costs, payer-related and regulatory costs,

arise from special characteristics of the healthcare sector. For most organizations, administrative costs related to payment would be considered operational or an aspect of financial management. For healthcare providers, however, payment is complex and administratively burdensome. A single, large physician practice, for example, may have separate contracts with more than 100 insurers, each of which may have a different set of requirements for submitted claims, resulting in substantial resources needed to obtain payment for services rendered.

Healthcare providers also incur substantial regulatory administrative costs associated with government mandates, as well as requirements set by accrediting bodies. A hospital, for example, must comply with standards for state licensure and, depending on the state, certificate of need (CON) regulations, numerous federal regulations such as those set by the Occupational Safety and Health Administration (OSHA) and the Americans with Disabilities Act (ADA), and the requirements for accreditation by the Joint Commission. The Health Insurance Portability and Accountability Act of 1996 (HIPAA), in particular, has imposed wide-ranging requirements related to the privacy of patient information, with an accompanying increase in administrative costs to comply with these requirements.

More generally, other researchers have proposed a systemwide categorization of administrative costs as transaction-related, benefits management, selling and marketing, and compliance with regulatory requirements. Using insurers as an example, transaction-related costs stem primarily from the collection of premiums and the processing of claims, with the costs of benefits management being due to the activities associated with health plan design. Selling and marketing costs would include expenses from underwriting and marketing health plans mainly to employers but also to individuals. Finally, reserve requirements and premium taxes are examples of costs due to compliance with regulatory requirements.

Health Policy Issues

Proposals for reforming the U.S. healthcare system typically include recommendations that administrative costs be reduced, and most would agree

that reductions in these costs could release resources that could be devoted to providing more health services or increased health insurance coverage. Although recommendations to reduce administrative costs are common, less common are specific proposals for how to accomplish this objective.

One study that estimated healthcare administrative costs in the United States and Canada concluded that administrative costs are considerably higher in the United States than in Canada and argued that the United States should adopt a Canadian-like single-payer system of universal coverage. However, others have pointed out that definitions of administrative costs differ between the United States and Canada. For example, U.S. estimates typically include administrative costs associated with research, while estimates for Canada do not. In addition, single-payer systems may have hidden social costs due to longer patient waiting times and the unavailability of some services. Yet another criticism is that while moving to a Canadian-like system might reduce administrative costs, total expenditures on healthcare would likely increase due to greater utilization because more people would have health insurance coverage.

At the organizational level, the real challenge is to distinguish between necessary and unnecessary administrative costs. Even the most efficient and productive provider or insurer must incur a certain level of administrative costs. Thus, efforts to control administrative costs must focus on eliminating costs due to waste and other forms of inefficiency rather than on simply reducing overall costs. For providers, in particular, adverse effects could result from a simple proportionate decrease in administrative costs because costs associated with certain administrative activities are essential for the provision of safe, effective, high-quality patient care.

For the nation's healthcare system as a whole, policy changes have the potential to result in substantial reductions in unnecessary administrative costs. For providers, the multitude of payers, each having specific, and often quite different, paperwork requirements, is an obvious target. Policy changes aimed at standardizing the methods of billing for and collecting payment could lead to significant reductions in payer-related administrative costs.

Regulation is another area in which broad-based policy changes could have a big impact, given the remarkable number and scope of regulations affecting providers and insurers. For

example, a study in 1976 by the Hospital Association of New York reported that 164 different agencies regulated 109 different areas of hospital operations. Since that time, these differing, and sometimes competing, regulatory requirements have soared. Increased collaboration among regulatory agencies, perhaps mandated by federal legislation, could both decrease administrative costs and insure improved coordination of regulatory activities.

New regulatory programs typically are designed to improve the safety or quality of healthcare. For example, the CMS is moving toward mandatory reporting of quality information as part of its pay-for-performance initiative. New regulatory programs, however, typically entail additional costs, resulting in an even greater administrative burden for providers. Unfortunately, coordination between existing and new regulations is rare, leading to increased, and sometimes even contradictory, administrative requirements.

Future Implications

Administrative costs in the nation's healthcare sector are a continuing source of policy concern. While all organizations incur costs associated with managerial or administrative activities, organizations in the healthcare sector face a complex system of payments, with each provider payment being from public programs (primarily Medicare and Medicaid) and many different private insurers and with each payer having separate and often quite different paperwork requirements. Furthermore, organizations in the healthcare sector face regulations set by numerous government agencies at all levels—local, state, and federal—with differing agencies having sometimes conflicting requirements. Reducing administrative costs clearly has the potential to constrain the growth of health expenditures in the nation, but cost control programs must carefully distinguish between necessary and unnecessary administrative costs to avoid potentially adverse effects on the effectiveness, safety, and quality of patient care.

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See also Cost Containment Strategies; Cost of Healthcare; Health Economics; Health Insurance; Hospitals; International Health Systems; Payment Mechanisms; Regulation

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<http://www.cms.hhs.gov>
- Healthcare Financial Management Association (HFMA):
<http://www.hfma.org>
- National Coalition on Health Care (NCHC):
<http://www.nchc.org>

ADVERSE DRUG EVENTS

The use of medications (pharmaceutical drugs consisting of prescription and over-the-counter drugs, biologics, vaccines, and/or dietary supplements) generally results in beneficial, defined therapeutic outcomes when these drugs and related medications are taken properly and appropriately monitored. Nevertheless, there are inherent risks in using any medications. Adverse drug events are frequent and costly consequences of medication use. They are widely reported to be a significant cause of patient morbidity and mortality, and they cost billions of dollars in annual healthcare expenditures.

There is no universally accepted definition for an adverse drug event, and numerous definitions exist. Most definitions are similar to those put forth by the World Health Organization (WHO)

and/or the U.S. Food and Drug Administration (FDA). The WHO defines an adverse drug event as any response to a drug that is noxious and unintended in doses normally used in people for diagnosis, prevention, and treatment. The FDA describes serious adverse drug events as events that result in patient death, life-threatening outcomes, hospitalization, disability, congenital anomaly, and outcomes requiring healthcare interventions.

Adverse drug events include both preventable and unavoidable events, the latter of which are also known as adverse drug reactions. An adverse drug reaction is an unintended, undesired, and unexpected response to a drug that negatively affects a patient. It may result in the need to change drug therapies and/or other treatments; hospitalization or other institutional admission or prolonged stay; and patient complications, including disability or death. Common side effects of pharmaceutical drugs are not generally considered to be adverse drug reactions.

Adverse drug events include the following: unexpected, injurious adverse drug reactions experienced during use of the medicine; and harmful outcomes secondary to preventable medication errors, including errors of omission or commission. The causes of medication errors (i.e., preventable adverse drug reactions) are multifactorial and can be related to drug prescribing, order communication, dispensing, administration, monitoring, product packaging and labeling, product nomenclature, education, monitoring, and other product use. Medication errors result from failed systems, lack of knowledge, and lapses in performance or mental processes—regardless of whether the medication is under the control of the patient, caregiver, or healthcare practitioner. Medication errors may be caused by defective systems involving patients and caregivers, healthcare practitioners, regulators, manufacturers, healthcare organizations, and other entities.

In addition to physical afflictions, adverse drug events impose a significant economic burden on society. The number of people who reportedly died from medication errors increased 2.5-fold from 1983 to 1993. The national Institute of Medicine (IOM) estimated that approximately 106,000 individuals died from an adverse drug event in 1994, and an estimated 2.2 million individuals were hospitalized with a serious adverse drug event. In

2006, the IOM concluded that at least 1.5 million preventable adverse drug events occur in the United States annually, and the true number might be much higher. The IOM conservatively estimates the 2006 national hospital costs associated with adverse drug events at \$3.5 billion.

In 1995, Johnson and Bootman developed a probability pathway model to estimate the direct cost of managing drug-related morbidity and mortality in the ambulatory-care setting in the United States. Their results showed that drug-related mortality and morbidity cost \$76.6 billion per year. An updated analysis based on that 1995 model showed that the cost of drug-related problems among ambulatory Americans more than doubled in 2000 to an estimated \$177.4 billion, with hospital admissions accounting for \$121.5 billion or 69% of the total costs. These costs are borne by patients, families, health insurers, government, healthcare providers, employers, and others.

Reporting Systems

Identification and reporting of adverse drug events is a crucial first step in improving patient safety. For optimal risk communication and quality improvement purposes, it is worthwhile to track potential as well as the actual adverse drug events since they can all lead to patient injury in the future.

There are a number of national surveillance systems for reporting errors, adverse events, and near misses. These systems vary with respect to scope and whether they use active or passive surveillance mechanisms. Passive systems rely on the spontaneous, voluntary reporting of observed adverse events by clinicians and others who are involved with the event, while active reporting involves the regular, periodic collection of event data or medical records from healthcare providers or facilities. Spontaneous voluntary reporting has long been the primary mechanism to identify adverse events; however, it is believed that spontaneous reports can identify only 1 in 20 adverse drug events.

The major passive adverse drug event reporting and surveillance systems include the following: U.S. FDA—MedWatch program, U.S. Department of Health and Human Services—Vaccine Adverse Event Reporting System (VAERS), United States Pharmacopeia (USP)—MEDMARX[®], and the

USP/Institute for Safe Medication Practices (ISMP)—Medication Error Reporting Program.

The U.S. FDA's MedWatch program is a voluntary reporting system for healthcare providers or consumers regarding serious adverse events, product quality problems, or product use errors. Reportable products under MedWatch include FDA-regulated drugs, biologics, medical devices, cosmetics, and special nutritional products.

The VAERS is a cooperative program of the U.S. FDA and the Centers for Disease Control and Prevention (CDC). The VAERS system tracks adverse events believed to be associated with a given vaccine, which are voluntarily reported, analyzed, and made available to the public.

The USP is a private, quasi-regulatory organization. It administers MEDMARX[®], an Internet-accessible medication error and adverse drug reaction reporting system for participating hospitals and healthcare systems. The USP national database includes records on more than 1.1 million events and consists of proprietary data compiled from participating institutional subscribers. The USP/ISMP-Medication Errors Reporting Program (MERP) collects and reviews reports of actual and potential medication errors submitted by healthcare professionals. The USP/ISMP-MERP attempts to determine the causes of medication errors, including name label and packaging hazards.

The major active governmental surveillance systems for adverse drug events include the following: U.S. FDA-Adverse Event Reporting System (AERS), National Electronic Injury Surveillance System-Cooperative Adverse Drug Events Surveillance System (NEISS-CADES), and the Substance Abuse and Mental Health Services Administration-Drug Abuse Warning Network (DAWN).

The U.S. FDA-AERS includes data from adverse drug reaction reports submitted by pharmaceutical manufacturers (as required by regulation) and voluntary submissions through MedWatch. The AERS includes the FDA-regulated drugs and biologics.

The NEISS-CADES is a collaborative, multi-agency program administered by the CDC, the Consumer Product Safety Commission, and the U.S. FDA. This system includes survey data on injuries and adverse drug effects that are extracted from the medical records from emergency department visits at 64 selected U.S. hospitals. The FDA and CDC analyze these data with the goal of

developing interventions for preventing future adverse drug events.

The Substance Abuse and Mental Health Services Administration-DAWN collects drug- and alcohol-related data from emergency department visits and medical examiner records in 22 U.S. cities regarding adverse events associated with the nonmedical use of legal or illegal drugs and other substances.

Although not limited to adverse drug events, there are also a number of state adverse-event-reporting programs. In 2008, 26 states and the District of Columbia had laws or regulations for the mandatory reporting of adverse events to state agencies by hospitals and other healthcare facilities. These include very serious events that could result in patient death, harm, or serious injury, such as “never events” or “sentinel events” as categorized by the National Quality Forum or the Joint Commission.

In the private sector, the Health Maintenance Organizations Research Network (HMORN) conducts an active surveillance system. The HMORN researches and disseminates information about adverse events reported through managed-care health plans’ defined populations, providers, delivery systems, and data. In 2008, 15 large managed-care plans were included in the network consortium.

A few commercial online event-reporting systems exist for spontaneous reporting in acute-care settings, and one healthcare alliance (Premier, Inc.) developed a proprietary incident reporting system for pharmacy, infection control, and incident management. Benchmarking capabilities from such online incident reports is a helpful process, albeit limited by insufficient database linkages. Current reporting systems in acute-care settings may have the capability to include UB-92, UB-04, or equivalent electronically transmitted billing submission discharge data (e.g., age, gender, diagnosis, and procedures) for inpatients, but are limited by lack of clinical indications, double counting of patients, unknown linkages between prescriber/drug and drug/indication, and other issues.

The described adverse drug events-reporting systems provide numerous advantages. Yet the ability to learn from most of them is hindered by underreporting, limited scope, unknown rates of

adverse event occurrence, lack of standardization, and individual event reports that cannot be combined and/or generalized. The use of administrative data, such as claims and discharge data, represents another major method for measuring adverse drug events. Limitations of only using administrative data include incomplete information that is bereft of clinical detail and potential bias in coding reimbursable conditions. More optimal systems combine methods from multiple sources to estimate the incidence and prevalence of adverse drug events within systems as well as to determine causes and outcomes.

Research and Strategies

Research studies examining adverse drug events have accumulated since the 1960s, and findings demonstrate considerable variations in incidence rates, risk factors, and definitions. Identification of adverse drug events is a crucial first step in improving patient safety. One reason why it is difficult to study them is that reliable identification and classification of events is difficult. The necessary prerequisite to studying adverse drug events is to identify them accurately and consistently. The main methods of detecting adverse drug events are through direct observation by trained observers, voluntary reporting, and chart review. More optimal use of information technologies should aid future research.

Most existing studies have focused on adverse drug events among hospitalized patients rather than outpatients (including those in community settings). Most articles on hospital-based safety systems rely on incident reports by clinicians, case studies, events detected by local computer systems, and review of the chart or clinical record. Published information on event detection in hospitals is typically available from individual reports, which renders it difficult or impossible to compare study results and evaluate rates to explore characteristics and causes. As strategies for preventing and reducing the impact of adverse drug events in the outpatient setting are developed, an important component will be the newly implemented Medicare’s Medication Therapy Management Services (MTMS).

The prevalence of prescription medication use among the ambulatory adult population increases

with advancing age. Even though most medication errors do not result in injury, the extensive use of medications by the geriatric population suggests that sizeable numbers of older persons are affected. Previous studies on risk factors associated with adverse drug events in elderly populations documented that demographic and socioeconomic characteristics, multiple chronic disease condition, recent hospitalization, previous adverse drug event history, and specific medications can affect the occurrence of adverse drug events. MTMS is part of the Medicare Prescription Drug, Improvement and Modernization Act of 2003, which provided (among other provisions) a voluntary outpatient prescription drug benefit to Medicare beneficiaries starting in January 2006. Local or regionally based MTMS are intended for a targeted Medicare population, which is defined as those individuals who have multiple chronic diseases, are taking multiple prescription drugs, or are likely to incur high medication expenses. The purpose of MTMS is to optimize therapeutic outcomes and decrease costs by improving medication use and reducing adverse drug events in the targeted population.

Patients, healthcare providers, and private and government organizations should work together to enhance the identification and reporting of adverse drug events. Greater analysis of adverse drug event reports will help in information dissemination and education to prevent and minimize their occurrence and associated problems. Various recommendations to prevent adverse drug reactions and medication errors have been posited. These include encouraging patients to take a more active role in their healthcare, increasing communication between patients and healthcare providers, using more effective information technologies in the medication-use process, increasing the monitoring of patient safety, and calling for the U.S. FDA and other regulators to work with pharmaceutical manufacturers and others to improve drug product packaging and labeling.

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See also Benchmarking; Medical Errors; Medicare Part D Prescription Drug Benefit; Patient Safety; Pharmaceutical Industry; Pharmacoeconomics; Pharmacy; U.S. Food and Drug Administration (FDA)

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- Joint Commission, Sentinel Event Policy and Procedures:
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- United States Pharmacopeia (USP), MEDMARX:
<http://www.usp/hqu/patientSafety/medmarx>
- U.S. Department of Health and Human Services (HHS), Vaccine Adverse Event Reporting System (VAERS):
<http://vaers.hhs.gov>

U.S. Food and Drug Administration (FDA), Adverse Event Reporting System (AERS): <http://www.fda.gov/cder/aers/default.htm>

U.S. Food and Drug Administration (FDA), MedWatch: <http://www.fda.gov/medwatch>

ADVERSE SELECTION

Adverse selection arises in markets where there is asymmetric information between buyers and sellers. Asymmetric information occurs when one party in a transaction or contract has information that is not observable to the other party. Adverse selection is a term commonly used by economists, insurers, statisticians, and policymakers to explain what happens when individuals have unobserved characteristics and make their choices based on those characteristics. Moral hazard is another important aspect of health insurance markets and is often studied in the same context as adverse selection. Moral hazard defines the situation where the cost of one's action is shared with another party (e.g., insurer), and this causes one to behave differently than one otherwise would if one were responsible for the full cost of one's action. For example, an insured person may consume more healthcare with insurance than he or she would if he or she paid out of pocket. In contrast, adverse selection occurs when an individual enters a contract based on his or her private and unobservable information. An example of this is an expectant mother choosing an employer that offers generous maternity benefits over one that does not.

Insurance is designed to provide protection from unexpected risks. However, an individual may have a better understanding of his or her future healthcare needs than a health insurer. Individuals may know their expected health expenditures through their parents' medical histories or from genetic tests. Adverse selection occurs when they choose insurance coverage with this in mind. If insurance companies are not aware of individual risk levels, then insurance markets may experience adverse selection as a result of high-expected-cost individuals purchasing more comprehensive coverage. This will likely lead to higher premiums and could drive low-expected-cost individuals to less

comprehensive insurance policies. In contrast, if potential risks are common information for both parties, then high-risk individuals may face barriers to coverage of predictable expenditures because insurers will exclude likely events from an insurance policy.

The Lemon's Principle

The concept of adverse selection was first formally introduced by George A. Akerlof in his 1970 seminal article titled "The Market for Lemons: Quality Uncertainty and the Market Mechanism." In the article, Akerlof presents adverse selection in the context of a used car market where the sellers know the quality of the car they are selling and the buyers are only aware of the distribution of the quality of the cars for sale. The quality of a used car could vary from good to bad (a lemon), but the buyers have no way of identifying the quality of each car, especially if all cars are sold at the same price.

Consider a market where there are five used cars with varying quality levels for sale. For simplicity, we will assign a cardinal index of values to each of these cars: 0, 0.25, 0.5, 0.75, and 1. Assume that the seller's reservation sale price (i.e., lowest price) of each car is equal to $\$2,000 \times \text{quality}$. If the market price is set at $\$2,000$ initially, then all five cars would be offered for sale. However, since the buyer only knows the distribution of the quality of cars, his offer price will be equal to $\$2,000 \times \text{average quality}$ (0.5), or $\$1,000$. Thus, no cars would sell for $\$2,000$. If the market price is then brought down to $\$1,000$ to accommodate the buyer's offer, then the two best cars would exit the market since the new market price is lower than their reservation value. The withdrawal of the two best cars results in a drop in the average quality of the remaining cars to 0.25, and the buyer's offer price would then fall to $\$500$. Again, no cars would be sold. If the market price falls further to match the buyer's offer at $\$500$, the next best car would exit the market, leading to a further drop in the average quality of the remaining cars in the market. A continuation of this pattern leads to bad cars driving the good cars from the market, leaving no market in the end. This example, known as the lemon's principle, is an extreme case of adverse selection.

However, in most cases, trade is not totally eliminated, though market allocations may result in economic inefficiencies.

Adverse selection is a common consideration in health insurance markets. Individuals with higher expected healthcare costs prefer more generous health insurance plans than do individuals with lower expected healthcare costs. Thus, more generous health insurance plans will offer higher premiums to profitably provide generous coverage. This is analogous to Akerlof's lemon's principle. A health insurance company offers premiums designed to cover the average cost of health expenditures as well as fixed costs. If at this premium low-risk individuals decline health insurance, the premium will rise to reflect the higher expected expenditures of the individuals who select the plan. This cycle results in high-risk individuals driving the low-risk individuals from the health plan. In the context of insurance, this is called an adverse selection "death spiral" if it continues until no insurer can profitably offer a policy. The empirical evidence on the existence of adverse selection death spirals is mixed. In 2002, Thomas Buchmueller and John DiNardo found no evidence of a death spiral when insurers were restricted to offering the same premium to groups of individuals by community rating laws.

Pooling and Separating Contracts

In the above example, a pooling contract was offered. Under adverse selection, a pooling contract will lead low-risk individuals to decline coverage. It is possible for the insurance company to offer two health plans: one targeted at high-risk individuals and the other targeted at low-risk individuals. This is known as a separating contract, which could lead to a separating equilibrium where both types of individuals accept some form of coverage against future expenditures. The term *equilibrium* refers to a market equilibrium (price equilibrium) where the number of contracts offered by the insurer at a given price is equal to the number of contracts sought by individuals at that price. A health plan may offer partial coverage at a reduced premium and a second contract with full coverage. Under certain conditions, an equilibrium could be sustained where low-risk individuals select partial

insurance and high-risk individuals choose full coverage. An example of partial coverage might be a plan with an extremely high deductible.

Adverse selection may lead to a distortion in the quality of services offered. Richard Frank and his colleagues examined adverse selection in managed-care markets, where health plans offer coverage for different types of diseases. They show that as a consequence of adverse selection, health plans have an incentive to distort the quality of (or access to) certain types of care in order to attract low-risk enrollees and deter high-risk ones. They predict that a health plan will avoid high-cost enrollees by offering limited coverage for chronic (i.e., predictable) conditions, especially when they are highly correlated with other types of health expenditures.

Asymmetric Versus Imperfect Information

In the lemon's problem, the sellers had more information about the cars than did the buyers, and in the health insurance market, the buyers had more information about their future healthcare expenditures than did the insurers. If both parties had the same information about the product being exchanged, then adverse selection would not occur. This is true even if it is not perfect information. This is important because if both parties have the same information regarding average expected health expenditures, all beneficiaries may be willing to join a plan that protected against unexpected expenditures at the average expected price, and pooling would occur.

Addressing Adverse Selection

Many research studies have explored ways to overcome market inefficiencies due to adverse selection. Michael Spence introduced the concept that there are ways in which an individual can send a signal regarding his or her risk type. High-quality producers of a product will find a mechanism to reveal their unobserved quality to buyers in a way that low-quality producers cannot profitably replicate. Although signaling is common in other markets, individuals tend to reveal verifiable private information to obtain better coverage in health insurance markets.

It is common for disability insurers to require a comprehensive medical examination and detailed health information before providing disability coverage. They then design a contract that takes the person's medical history into account and may exclude certain causes of disability. Health insurance companies respond to adverse selection by excluding preexisting conditions during the 1st year of newly acquired coverage. Furthermore, the companies tend to offer a set of health plans with varying amounts of premiums and deductibles so that individuals can select an appropriate plan based on their risk type. For example, a healthy person may prefer to be in a low-premium, high-deductible plan rather than in a high-premium, low-deductible health insurance plan.

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See also Health Economics; Health Insurance; Medicaid; Medicare; Moral Hazard

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Henry J. Kaiser Family Foundation (KFF):

<http://www.kff.org/insurance/snapshot/chcm1110060th2.cfm>

National Association of Health Underwriters (NAHU):

<http://www.nahu.org>

National Bureau of Economic Research (NBER):

<http://www.nber.org>

The Economist: <http://www.economist.com/research/Economics>

AGENCY FOR HEALTHCARE RESEARCH AND QUALITY (AHRQ)

The Agency for Healthcare Research and Quality (AHRQ), which is part of the U.S. Department of Health and Human Services (HHS), is one of the nation's largest supporters of health services research initiatives. AHRQ's broad mission is to improve the quality, safety, efficiency, and effectiveness of healthcare for all Americans. To fulfill its mission, AHRQ conducts and supports health services research, both within the agency and through grants and contracts to universities, healthcare systems, hospitals, and physicians' offices. AHRQ also works closely with its sister agency the National Institutes of Health (NIH), which conducts biomedical research.

Background

A number of federal organizations preceded the AHRQ. The federal Omnibus Budget Reconciliation Act of 1989 established its immediate predecessor, the Agency for Health Care Policy and Research (AHCPR). The purpose of AHCPR was to enhance the quality, appropriateness, and effectiveness of healthcare services and access to healthcare. At the time, the AHCPR was the successor to the National Center for Health Services Research and Health Care Technology Assessment. As a research agency, the AHCPR supported studies and reviews to improve the quality of healthcare. One of its major responsibilities was to use research to develop, review, and update clinical practice guidelines to advise healthcare practitioners in the prevention, treatment, and management of specified health conditions. This guideline development program continued until 1996. Some of the clinical practice

guidelines issued by the agency were highly controversial, and specific medical societies lobbied their legislators to end the funding of the AHCPR.

In 1999, the U.S. Congress passed legislation reauthorizing the AHCPR but changed its name to the Agency for Healthcare Research and Quality. This change was strategic and intentional because it confirmed the agency's dedication to scientific research. Removal of the word *policy* clarified that the agency does not determine healthcare policy. While the AHRQ does not direct policy, it continues to support research and inform policymakers.

Although the AHRQ is no longer obligated to develop clinical practice guidelines, the agency retains many critical functions. Specifically, the AHRQ must (a) meet the information needs of its consumers (patients, practitioners, health system leaders, and policymakers) so that they can make more informed decisions; (b) build the evidence base for what works and does not work in healthcare and develop the information, tools, and strategies that decision makers need; (c) continue the national Medical Expenditure Panel Survey (MEPS) to evaluate various cost-related issues, including the types of healthcare services Americans use, the access and frequency of healthcare service use, and the amount of money Americans pay for care; (d) develop a database that provides information to states on their residents' access to healthcare services and on the quality and use of those services; (e) establish the Centers for Education and Research on Therapeutics (CERTs) as a permanent program; and (f) support the use of clinical practice guidelines through Evidence-Based Practice Centers (EPCs), National Guidelines Clearinghouse, and the U.S. Preventive Services Task Force.

During its transition from the AHCPR to the AHRQ, John M. Eisenberg provided pivotal leadership that positioned the agency for its current functions. Like its predecessor, the AHRQ continues to have a well-educated multidisciplinary staff. Scholars from disciplines such as health services research, dentistry, medicine, nursing, and public health work to support other scholars and investigators in the pursuit of knowledge.

Current Centers and Programs

AHRQ's organizational structure supports its key mission through a number of focused centers.

Specifically, the centers include the following: (a) quality improvement and patient safety; (b) outcomes and effectiveness of care; (c) clinical practice and technology assessment; (d) healthcare organization and delivery systems; (e) primary care (including preventive services); and (f) healthcare costs and sources of payment. The staff in these centers accomplish the work using a variety of funding mechanisms, such as grants and contracts, and in-house research. Through these various strategies, the agency forms effective partnerships with other government agencies, academic institutions, and industry.

Specific Projects

The AHRQ supports 12 EPCs. The functions of the EPCs are to review and synthesize available knowledge of various healthcare topics and describe the quality and the strength of that evidence—specifically research findings. The synthesized information is then made available to providers, insurers, and others for use in determining their own practices and policies. Topics can be nominated by various public or private organizations as well as the agency and are examined to determine whether or not there exists a sufficient scientific base to warrant the synthesis and review. The importance of the topic to large segments of the population, such as those receiving Medicare or Medicaid, or those associated with high costs or chronic illnesses are typical subject areas.

The AHRQ provides core support for 14 CERTs and their coordinating centers. The U.S. Food and Drug Administration (FDA) also provides funding, and individual centers may receive funding from other public or private sources. Broadly, the CERTs are to develop and disseminate knowledge about a range of products that may be used to prevent or treat disease. The desired result is that patients and providers will use such information to determine appropriate use—not over- or underutilization. Specifically, the program objectives are (a) to increase awareness of both the uses and risks of new drugs and drug combinations, biological products, and devices, as well as of mechanisms to improve their safe and effective use; (b) to provide clinical information to patients and consumers,

healthcare providers, pharmacists, pharmacy benefit managers, purchasers, health maintenance organizations (HMOs) and healthcare delivery systems, insurers, and government agencies; and (c) to improve quality while reducing the cost of care by increasing the appropriate use of drugs, biological products, and devices and by preventing their adverse effects and the consequences of these effects (such as unnecessary hospitalizations).

Another mandate is to convene the U.S. Preventive Services Task Force (USPSTF), an interdisciplinary group of clinicians and scientists with expertise in primary-care services. This group uses established guidelines to review evidence about preventive services and makes recommendations, mostly directed at those who provide primary care. Agency staff works closely with one EPC, which focuses on this assignment, to develop materials for consideration by the panel. Other federal agencies also contribute to the scientific effort. Additionally, other experts and organizations review draft documents to obtain the best and clearest guidance. The statements in the published guidelines become the standard of care nationwide.

In existence since 1996, the Medical Expenditure Panel Survey (MEPS) provides a unique resource on the cost and use of healthcare and health insurance coverage in the nation. Information is collected on two components: (1) households and (2) insurance. Over a 2-year study period, data are collected on all members of selected households, including their health conditions, access to care, health insurance coverage, and employment. By interviewing respondents over the 2-year study period, data about changes in health conditions, employment, and other factors can be examined for their potential impacts. The health insurance component is also known as the Health Insurance Cost Study and obtains data from employers on the coverage provided to their employees, its costs, and what benefits are provided.

Since 1988, the Healthcare Cost and Utilization Program (HCUP) has been the largest all-payer collection of hospital inpatient-care statistical information in the nation. It gathers longitudinal data on hospital costs, including all-payer and encounter-level data. These data are available to scholars and others and are useful particularly to those who are examining statewide data. Like most AHRQ products, the information is available on the agency's

Web site. The HCUP is also a good example of how the AHRQ does not make policy but provides important resources for those who do.

The HIV Research Network (HIVRN) is sponsored by the agency and several other organizations of the federal government. The network includes 18 member practices that treat about 14,000 patients and report conditions of HIV patients, therapeutic interventions, and services delivered. Combining these data provides a resource for understanding patterns in management. While data are made public through HIV Net, the network does not release information that can potentially identify participating practices, individual patients, or locations.

To provide information to its many consumers, the AHRQ supports a number of other projects. Over the years, AHRQ has invested millions of dollars to implement and improve the nation's health information technology. To share the experience and knowledge of its health information technology grantees, the agency developed the National Resource Center for Health Information Technology (Health IT). Through this center and its Web site, the agency provides resources for organizations to use in assessing their health-related information technology. The center's Web site contains a wealth of information, including a compendium of surveys and a tool kit.

The Patient Safety Network (PSNet) is a compilation of articles and recent findings related to patient safety issues. It is funded by the agency and guided by a national advisory board. Individuals may receive the updates online through a registration process.

Another important agency project is the National Consumer Assessment of Healthcare Providers and Systems (CAHPS). Individuals and organizations can use CAHPS to assess the patient-centeredness of care, compare and report on performance, and improve the quality of care. The health plan survey component of CAHPS, which began in 1998, now anchors this group of surveys that organizations can use to evaluate their own performance in comparison to the national database.

The AHRQ maintains an excellent series of Web sites, and personal contact and support from agency staff are easily available.

Ann R. Bavier

See also Clancy, Carolyn M.; Clinical Practice Guidelines; Eisenberg, John M.; Evidence-Based Medicine (EBM); Health Services Research, Origins; Patient Safety; Quality of Healthcare; U.S. Food and Drug Administration (FDA)

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Evidence-Based Practice Centers (EPC):

<http://www.ahrq.gov/clinic/epc>

Healthcare Cost and Utilization Project (HCUP):

<http://www.ahrq.gov/data/hcup>

Medical Expenditure Panel Survey (MEPS):

<http://www.meps.ahrq.gov>

National Consumer Assessment of Healthcare Providers and Systems (CAHPS): <http://www.caphs.ahrq.gov>

National Resource Center for Health Information Technology (Health IT): <http://healthit.ahrq.gov>

Patient Safety Network (PSNet): <http://psnet.ahrq.gov>

U.S. Preventive Services Task Force (USPSTF): <http://www.ahrq.gov/clinic/uspstfix.htm>

AIKEN, LINDA H.

Linda H. Aiken is an influential nurse leader and researcher in the field of nursing outcomes research. Aiken is the Claire M. Fagin Leadership Professor of Nursing, professor of sociology, and director of the Center for Health Outcomes and Policy Research at the University of Pennsylvania. She is also a senior fellow at the Leonard Davis Institute for Health Economics, and research associate in the Population Studies Center, and she codirects the National Council on Physician and Nurse Supply.

Aiken conducts research on healthcare outcomes and health workforce policy. She is the principal investigator of a five-country study of hospital-care outcomes in the United States, Canada, England, Scotland, and Germany and is involved in evaluating the impact of 90 healthcare partnerships funded by the United States Agency for International Development (USAID) in Eurasia.

Prior to joining the faculty of the University of Pennsylvania in 1988, Aiken was vice president of the Robert Wood Johnson Foundation (RWJF), where she directed the research and evaluation program. While at the foundation, she designed a \$100 million demonstration initiative to improve care for the chronically mentally ill, for which she received a unique Joint Secretarial Commendation from the Secretary of the U.S. Department of Health and Human Services and the Secretary of the U.S. Department of Housing and Urban Development.

Aiken has received many awards and honors for her work. She received the William B. Graham

Prize for Health Services Research, the Ernest A. Codman Award from the Joint Commission, the Baxter Episteme Award from Sigma Theta Tau International, the Barbara Thoman Curtis Award from the American Nurses Association (ANA), and the Distinguished Investigator awards from AcademyHealth. Aiken is also the recipient of three American Academy of Nursing Media Awards.

Aiken is an elected member of the national Institute of Medicine (IOM), where she is a member of the Board on Health Care Services. She is a fellow and former president of the American Academy of Nursing and an Honorary Fellow of the Royal College of Nursing of the United Kingdom. Aiken is also an elected fellow of the American Academy of Arts and Sciences, and the National Academy of Social Insurance, and a Distinguished Fellow of the Academy for Health Services Research and Health Policy. In addition, she is a member of the Council on the Economic Impact of Health System Change, and she has served on the Medicare Physician Payment Review Commission (PPRC) for 6 years.

Aiken received her bachelor's (1964) and master's (1966) degrees in nursing from the University of Florida, Gainesville, and her doctorate degree (1973) in sociology and demography from the University of Texas at Austin. She was a postdoctoral research fellow (1973–1974) in medical sociology at the University of Wisconsin, Madison.

Aiken has made many notable contributions to public health through innovative health services research, and she has had a significant impact on the way healthcare is delivered. Her work has greatly influenced nursing policies and practices, including nurse recruitment and retention, nurse work force supply, patient-care practices, and staffing. Aiken's work continues to be recognized by scholars and practitioners for her many contributions to improving health and medical care nationally and internationally.

Lubina Perez

See also American Nurses Association (ANA); Health Professional Shortage Areas (HPSAs); Health Resources and Services Administration (HRSA); Hospitals; International Health Systems; Nurse Practitioners (NPs); Nurses; Robert Wood Johnson Foundation (RWJF)

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University of Pennsylvania School of Nursing Faculty Profile: <http://www.nursing.upenn.edu/faculty/profile.asp?pid=107>

ALLIED HEALTH PROFESSIONALS

Allied health professionals are the staff involved with the delivery of healthcare or related services pertaining to the identification, evaluation, and prevention of diseases and disorders. They are also involved in dietary and nutrition services, rehabilitation, and health system management. In the United States, there are more than 6 million allied health professionals from a myriad clinical support and technical occupations in healthcare services. According to the U.S. Department of Labor, about 60% of the nation's healthcare workforce is composed of allied health professionals.

Allied health professionals represent more than 70 areas of expertise, and they are trained in more than 2,500 higher-level educational institutions in the nation. These professionals include dental hygienists, diagnostic medical sonographers, dietitians, medical technologists, occupational therapists,

physical therapists, radiographers, respiratory therapists, and speech-language pathologists.

Although there is no standard definition or number of health professions that consistently fall under the term *allied health professionals*, it is clear that these professionals have an important impact on the nation's healthcare system. They are actively engaged in the provision and delivery of health services, working alongside physicians, nurses, pharmacists, dentists, optometrists, and podiatrists.

Need for Allied Health Professionals

The widespread field of allied health became well-known after the passage of the federal Allied Health Professions Personnel Training Act of 1966. This act specifically identified the growing need for standardized education and support for allied health professionals.

Today, because of the aging of the nation's population, the increase in the number of people with chronic diseases, and the development of new medical technology, there is a growing demand for allied health professionals. These professionals increase the efficiency of clinicians by providing support services.

Schools of allied health professions are attempting to meet the need for quality education of this broad professional group by fostering research, creating professional networks, and providing early exposure to high school students of the varied allied health professions available. The federal government provides funds for individuals needing financial assistance for education in allied health professions. The government also recruits and trains professionals to work in shortage areas. Because of the nation's changing demographics, there is a need to address disparities in higher-level education based on ethnicity, socioeconomic status, and area of residence. For example, the changing ethnic composition of the nation will result in an increasing need for culturally competent healthcare providers who are bilingual and bicultural. In particular, individuals from traditionally underrepresented ethnic populations in higher education need to be recruited to diversify the allied health professional workforce. Shortages in rural areas also need to be addressed.

Issues Facing Allied Health Professionals

Certification and/or licensure differ for each allied health profession, and specialized training and education are required for all types of allied health professionals. Accreditation is a process in which educational programs in schools of allied health professions are reviewed so that standards, guidelines, and requirements remain consistent between schools and programs. Not all programs of allied health professions are accredited, so it is important for prospective students to assess the characteristics of educational programs through the Commission on Accreditation of Allied Health Education Programs (CAAHEP).

Allied health professionals have struggled for autonomy from other health professionals, and not all allied health professionals have the same requirements and restrictions in their practices. For example, insurance companies may only cover services of an allied health professional, such as a physician assistant, when working under a physician's direct supervision. Some practitioners may oppose competition from allied health professionals who provide similar healthcare services; especially as allied health education becomes more sophisticated. As allied health education continues to build on higher-quality programs that increase the scope of knowledge and expertise for allied health professionals, patients may seek services exclusively from them. Limitations currently exist for a patient to see a physician assistant, but this may change in the future. An ongoing discussion is currently taking place in terms of federal legislative policy regarding the scope of privileges available to allied health professionals.

Future Implications

The U.S. Department of Labor, Bureau of Labor Statistics, predicts that more than 90% of allied health professionals will grow at or above the average of all occupations through the year 2014. These statistics indicate a projected shortage of allied health professionals based on the need for their specialized services.

Healthcare is often viewed as being strictly under the domain of physicians and nurses. Promoting a greater understanding of the diverse

range of health professionals will likely result in higher levels of enrollment in schools of allied health professions, reducing their expected shortage. Faculty of schools of allied health professions are currently engaged in research concerning the factors related to the productivity, learning needs, and administration of allied health professionals and current issues facing their students and workforce.

Michelle Choi Wu

See also Access to Healthcare; Hospitals; Nurses; Nursing Homes; Physician Assistants; Physicians; Public Health

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- Bureau of Labor Statistics (BLS): <http://www.bls.gov>
- Commission on Accreditation of Allied Health Education Programs (CAAHEP): <http://www.caahep.org>

ALTMAN, DREW E.

Drew E. Altman is a leading expert on national health policy issues and an innovator in the private foundations. He currently serves as the president and chief executive officer of the Henry J. Kaiser Family Foundation, one of the nation's largest private foundations devoted to health

policy and health communications. Located in Menlo Park, California, with major facilities in Washington, D.C., the Kaiser Family Foundation is a leading independent voice and source of research and information on healthcare in the United States. The foundation serves as a nonpartisan source of facts, information, and analysis to inform policymakers, the healthcare community, and the public. It runs its own research and communications programs, often in partnership with other organizations. In 1991, Altman oversaw a complete overhaul of the foundation's mission and operating style that served as a catalyst to enhance its standing today as a premier health policy and communications foundation.

Altman received his bachelor's degree from Brandeis University and a master's degree in political science from Brown University. He later completed his doctorate degree in political science at the Massachusetts Institute of Technology (MIT), where he later taught graduate courses in public policy. Altman went on to do postdoctoral work at the Harvard School of Public Health before entering public service.

Altman is a former commissioner for the Department of Human Services for the state of New Jersey, under Governor Thomas H. Kean, where he developed pioneering programs in welfare reform, Medicaid managed care, school-based services, and services for homeless people. From 1981 to 1986, he served as a vice president at the Robert Wood Johnson Foundation (RWJF). At the RWJF, he developed model national demonstration programs for HIV services and health services for homeless people. During President Carter's administration, Altman served as a special assistant in the Office of the Administrator of the Health Care Financing Administration (HCFA) (now the Centers for Medicare and Medicaid Services [CMS]). Prior to joining the Kaiser Family Foundation in 1990, Altman served as the director of the Health and Human Services program at the Pew Charitable Trusts.

Altman is a member of the national Institute of Medicine (IOM), where he serves on the governing council, and the American Academy of Arts and Sciences.

Lubina Perez

See also Kaiser Family Foundation; Public Policy; Robert Wood Johnson Foundation (RWJF); Vulnerable Populations

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Web Sites

Henry J. Kaiser Family Foundation: <http://www.kff.org>

AMBULATORY CARE

The National Center for Health Statistics (NCHS) defines *ambulatory care* as healthcare that is provided to persons in physician offices, hospital outpatient departments, and hospital emergency departments without their admission to a health-care facility. Ambulatory care consists of a wide array of medical and healthcare services, including diagnosis, observation, treatment, rehabilitation, and preventive services. The term *ambulatory care* refers to the fact that persons who are given this type of care are generally able to ambulate or walk about, unlike some hospital inpatients who may not be able to leave their beds.

Utilization

Patient concerns or medical conditions that are addressed through ambulatory care vary widely. Nationally, about 50% of all physician visits in the United States in 2005 were due to specific symptom complaints such as respiratory or musculoskeletal

issues. A general medical examination, however, was the specific reason most often cited for a physician visit, making up about 7% of all ambulatory-care visits. About 18% of all visits were for preventive-care purposes, and 33% of visits were for new conditions or infectious diseases. Through these visits, there are a wide variety of services that are offered. Diagnostic or screening services were ordered at 87% of ambulatory visits. Health education was ordered or provided at 38%, nonmedication treatment (consisting of services such as physical therapy, psychotherapy, or wound care) was ordered at 18%, and surgical procedures were ordered or performed at 6% of office visits.

The Healthcare System

Ambulatory care is the primary means by which medical care is provided to the U.S. population, constituting more than 1 billion visits yearly. In 2003, this accounted for about 27% of the nation's healthcare spending. In 2005, nearly 60% of all visits were to primary-care specialists (more than 22% to generalists and family medicine physicians), and the remaining 40% of total visits split nearly evenly between surgical and medical specialists.

As the U.S. healthcare system is scrutinized and reassessed to improve its overall effectiveness, the important role of ambulatory care in the ability to improve quality and control costs is being realized. In 2004, the National Quality Forum (NQF) met to identify a set of performance measures that will be used to improve the quality of ambulatory care in furthering this ideal. The 10 priority areas that were identified include patient experience with care; coordination of care; asthma; prevention (primary and secondary, including immunization); medication management; heart disease; diabetes; hypertension; depression; and obesity. These measures have been prioritized and focused in subsequent years through the Ambulatory Care Project, which is aimed at standardizing ambulatory-care performance measures and, in doing so, improving quality in the ambulatory setting.

The Agency for Healthcare Research and Quality (AHRQ) estimates that by improving the quality of and access to primary care through projects such as the Ambulatory Care Project, the nation might be

able to avoid more than 4 million hospitalizations each year. This could result in billions of saved healthcare dollars by enhancing access to effective treatments and focusing on prevention in an ambulatory setting in regard to chronic illnesses such as diabetes, congestive heart failure, asthma, and hypertension. It is estimated that in 2004, a total of \$29 billion was spent on inpatient care for 12 potentially preventable conditions, including \$2.6 billion for kidney damage due to long-standing uncontrolled diabetes and \$8.3 billion for complications involving congestive heart failure. Chronic illness visits currently make up a significant portion of ambulatory-care visits, constituting about 40% of visits in 2005. However, chronic care can be greatly improved, and illness exacerbations and secondary complications can be avoided, through enhanced access to primary-care settings.

Future Implications

As medical care in the nation continues to evolve and factors such as cost, quality, and attention to health promotion and chronic disease control have an impact on shaping the healthcare system, the idea and manifestation of ambulatory care will, as well, continue to change. Primary care will likely become more central, and a more patient-centered approach will take shape. A currently perceived strength of ambulatory care, in consideration of patient preference and health outcomes, is continuity of care. This is evidenced by the fact that in 2005, 87% of ambulatory visits in the nation were by established patients at that location and about 50% of all physician visits were with the patient's primary-care physician. The strength of continuity of care is central to the idea of patient-centered medical home, which will become a crucial aspect in comprehensive, personalized, high-quality care coordinated through a team approach. The idea, initially introduced by the American Academy of Pediatrics (AAP) in 1967, has undergone revision and is now being promulgated as a comprehensive plan by the American Academy of Family Physicians (AAFP), the AAP, the American College of Physicians (ACP), and the American Osteopathic Association (AOA) to improve outcomes, increase value, and help defragment the U.S. healthcare system.

Rapid advances in information technology may, as well, transform the concept of ambulatory care in novel ways. The electronic health record will contribute to efficiency, accuracy, and continuity in patient care and will be central to the impact that ambulatory care may provide in improved outcomes. Information technology may also alter the current practice model significantly through a greater ability to provide comprehensive services in home visits and greater access to patient education and ease of patient self-management coaching and patient empowerment, in addition to potential development of e-visit consultations. Electronic prescribing or e-prescribing will ensure more accurate and reliable medication management, cutting costs and greatly decreasing medical errors.

In addition to the philosophy of ambulatory care of striving to provide high-quality, patient-centered care within the community, ambulatory care, as well, offers significant cost savings and improved patient outcomes. Ambulatory care in the United States currently offers a wide range of services and is positioned to be a central component in the future direction of its evolving healthcare system.

J. Andrew Dykens

See also Access to Healthcare; American Medical Association (AMA); Cost of Healthcare; E-Health; Hospital Emergency Departments; Physicians; Primary Care; Quality of Healthcare

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 National Association for Ambulatory Care (NAFAC):
<http://www.urgentcare.org>
 National Center for Health Statistics (NCHS):
<http://www.cdc.gov/nchs>
 National Quality Forum: <http://www.qualityforum.org>

AMERICAN ACADEMY OF FAMILY PHYSICIANS (AAFP)

The American Academy of Family Physicians (AAFP) is the national professional association for family physicians. Representing nearly 94,000 physicians and medical students in the United States, it is one of the nation's largest medical associations. The AAFP's mission is to improve the health of patients, families, and communities by serving the needs of its members with professionalism and creativity. Its vision is to transform healthcare to achieve optimal health for all.

Decades of research clearly show that healthcare systems based on the patient-centered primary care that family physicians provide results in better health outcomes, lower costs and more equitable healthcare than systems based on fragmented and over-specialized care. The American Academy of Family Physicians (AAFP) is leading the charge to bring necessary improvements, conveniences, and modernizations in how medicine is practiced and coordinated. The academy is working with policy-makers and business leaders to demonstrate the efficacy of a patient-centered, primary-care-focused healthcare system and to bring about needed national reform.

History

Headquartered in Leawood, Kansas, the AAFP was originally known as the American Academy of General Practice. In 1971, its name was changed to reflect more accurately the changing nature of primary healthcare. The original purpose of the academy was to promote and maintain high quality for family physicians who provide comprehensive care

to the public. Over the years, the academy has expanded its purpose to also include (a) providing advocacy for the education of patients and the public in all health-related matters; (b) preserving and promoting quality cost-effective healthcare; (c) promoting the science and art of family medicine; (d) preserving the right of family physicians to engage in medical and surgical procedures; (e) providing advocacy, leadership, and representation; and (f) maintaining and providing an organization to represent the needs of its members.

The academy was instrumental in the establishment of family medicine as medicine's 20th primary specialty in 1969. The specialty was created to fulfill the generalist function in medicine.

The Profession

Family physicians provide the majority of primary care in the United States. In fact, annually nearly one in four of all physician office visits in the nation are made to general and family physicians. And family physicians provide the majority of care for America's underserved rural and urban populations.

Providing patients with a personal medical home, family physicians deliver a wide range of acute, chronic, and preventive medical-care services. Unlike some physicians who are limited to a particular organ, disease, age, or gender, family physicians integrate care for patients of both genders across the full spectrum of ages. Family physicians are dedicated to providing patients with a medical home where patients experience seamless, coordinated care with caring. They treat the whole person and foster an ongoing, trusting, personal physician-patient relationship.

Like other medical specialists, family physicians complete a 3-year residency program after graduating from medical school. As part of their residency, they participate in integrated inpatient and outpatient learning and receive training in six major medical areas: (1) pediatrics, (2) obstetrics and gynecology, (3) internal medicine, (4) psychiatry and neurology, (5) surgery, and (6) community medicine. They also receive instruction in many other areas, including geriatrics, emergency medicine, ophthalmology, radiology, orthopedics, otolaryngology, and urology.

Organization

The AAFP is governed by a Congress of Delegates composed of two delegates from each of the association's 55 constituent chapters, as well as delegates from residents and student groups, new physicians, and special constituencies groups. The congress meets annually and establishes the academy's policies and programs. The academy's board of directors and other standing and special commissions and committees then carry out these policies and programs. Delegates to the congress elect the board, which in turn appoints commission and committee members.

To support its advocacy efforts, the academy maintains a Government Relations office in Washington, D.C., for liaison with the U.S. Congress and the federal government.

Activities and Services

Family medicine was the first medical specialty to require its physicians to pursue continuing medical education (CME). A primary responsibility of the academy is to develop and provide its members with CME programs aimed at ensuring family physicians remain educated on the latest medical technologies, treatments, and techniques. To maintain active membership, the academy requires its members to earn 150 credits of CME every 3 years. The annual Scientific Assembly is the academy's largest meeting for continuing education, drawing more than 17,000 physicians and visitors.

To facilitate communication with its members and with patients, the academy also operates two Web sites, www.aafp.org and www.familydoctor.org. The academy's physician-focused Web site, www.aafp.org, provides resources for members, including the full text of the academy's publications. The physician-reviewed patient Web site, www.familydoctor.org, features searchable, easy-to-understand information on more than 500 medical conditions and illnesses. The site also includes Spanish language content, a drug database, and self-diagnosis flow charts.

To advance the discipline and provide resources for its members, the AAFP also publishes several peer-reviewed journals, including the nation's leading primary-care clinical journal, *American Family*

Physician. Other publications include *Family Practice Management* and a bimonthly research journal, *Annals of Family Medicine*. In addition to its peer-reviewed journals, the academy also publishes *AAFP News Now*, an all-member news and features publications available online, via e-mail, and by postal mail service.

Sarah Thomas

See also Access to Healthcare; Patient-Centered Care; Physicians; Primary Care; Primary-Care Case Management (PCCM); Primary-Care Physicians; Starfield, Barbara; Vulnerable Populations

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 Doctor: <http://www.familydoctor.org>

AMERICAN ACADEMY OF PEDIATRICS (AAP)

The American Academy of Pediatrics (AAP) is a membership and child advocacy organization, supporting the professional needs of its 60,000 members and advocating for children's health and safety in a broad range of venues. The AAP's mission is to attain optimal physical, mental, and social health and well-being for all infants, children, adolescents, and young adults.

Members of the AAP, who are largely in the United States, Canada, and Latin America, comprise pediatricians, pediatric medical subspecialists (such as pediatric cardiologists or adolescent health specialists), and pediatric surgical specialists. Members are board certified and called Fellows of the American Academy of Pediatrics, or FAAPs. Board certification is accomplished through the American Board of Pediatrics.

The central office of the organization is in Elk Grove Village, Illinois, a suburb of Chicago. It is a not-for-profit Illinois corporation. The AAP's Department of Federal Affairs is located in Washington, D.C.

The AAP was founded in 1930 by 35 pediatricians in response to the need for an independent pediatric forum to address children's needs. At that time, the idea that children had unique developmental and health needs was new. Preventive health practices now accepted as standard child healthcare (i.e., immunization, regular health exams) were only just beginning to change the custom of treating children as "miniature adults."

Organization

Today, the AAP is governed by a board of directors consisting of 10 members, who are elected by their regional districts and, thus, also serve as

district chairpersons. Members also vote each year for a national vice president, who also serves as president-elect. The executive committee, consisting of the president, president-elect, vice president, and executive director, conducts AAP business on a daily basis.

At the state level, there are AAP chapters, which are individually incorporated, have their own bylaws, and further the aims of the national organization as well as their local priorities.

More than 30 national committees develop many of the AAP's policies and programs, under the direction of the board of directors, to help achieve the academy's goals and objectives. Examples of national committees include the Committee on Nutrition, the Committee on Early Childhood, Adoption and Dependent Care, and the Committee on Injury, Violence and Poison Prevention.

In addition to being involved with the committees, members can participate in 1 of 46 sections pertaining to specific pediatric subspecialties, surgical specialties, or multidisciplinary areas. Section members are instrumental in providing educational sessions at the AAP's annual National Conference and Exhibition, as well as assisting with development of statements and practice guidelines, and many other projects. Examples of current AAP sections include Bioethics, Critical Care, Dermatology, Perinatal Pediatrics, and Uniformed Services, to name a few.

The AAP also has a small number of councils that incorporate many of the functions of committees and sections but provide for a broader vision and wider array of activities. Examples of councils include Communications and Media, Community Pediatrics, and Sports Medicine and Fitness.

Policy and Clinical Guidance

The AAP provides guidance to its members and the public on a wide range of issues. Its "Recommendations for Preventive Pediatric Health Care" form the basis of preventive care for each age, and the AAP is one of three organizations that collaborate to produce the annual *Recommended Immunization Schedule* for children and adolescents, which is used by schools, public health agencies, and private pediatric practices. In addition,

the AAP has issued statements of policy as well as technical reports on a vast array of topics, and practice guidelines on clinical issues.

Advocacy

The AAP advocates access to care for pediatric patients encompassing all aspects of accessibility, including financial, geographic, physical, and communicative access. The AAP believes that all children, women, and their families must have adequate health insurance regardless of income. All health insurance plans should have a comprehensive age-appropriate benefits package.

The AAP also believes that each child should have a “medical home”—a place where care is accessible, family centered, continuous, comprehensive, coordinated, compassionate, and culturally effective. The AAP works with government, communities, and other national organizations to help shape these and many other child health and safety issues.

Priorities

As 2010 approaches, priority issues for the AAP include (a) universal healthcare coverage for all children; (b) increased efforts to prevent and reduce childhood obesity; (c) expanded education about childhood health issues for parents and pediatricians; (d) greater understanding and research in human genetics; (e) increased efforts to reduce prematurity; and (f) improvements in vaccine efficacy and delivery. Mental health and oral health services are also priorities.

Engaging Government

The AAP's Office of Federal Affairs has been the academy's link to federal legislative activities in Washington, D.C., for nearly 40 years, giving pediatricians the information and tools necessary to become effective child advocates through Congress and/or federal agencies. This office works on issues affecting children's healthcare coverage, immunizations, pediatric drugs and medical devices, and much more. The academy was the driving force behind a pediatric

drug-labeling bill that requests drug companies to study their drugs in children, as well as the State Children's Health Insurance Program (SCHIP), an expansion of Medicaid that enables children from limited-income families to access comprehensive healthcare.

AAP staff also assists members in advocating for their patients at the state level by monitoring child health legislation and facilitating participation in the legislative and regulatory process. Issues that may be addressed at the state level include Medicaid, injury and violence prevention, immunizations, and many others.

Research

The AAP is home to several long-term research programs to enhance the delivery of healthcare to children. Its Pediatric Research in Office Settings program conducts studies using a network of 1,800 pediatricians working in office-based practices.

Publications, Public Information, and the Media

The academy has the largest pediatric publishing program in the world, with 120 titles for consumers and 400 for physicians and other healthcare professionals. In addition, AAP works extensively with the media and carries out public information campaigns to ensure that timely, accurate and focused messages and information reach families and professionals. The AAP publicizes the latest research in its journal, *Pediatrics*, as well as the latest AAP policies, campaigns, and partnerships with other organizations.

Community-Based Initiatives

The AAP works with community-based organizations on many programs, including numerous grant-funded projects. For example, the Community Access to Child Health (CATCH) Program supports pediatricians and communities that are involved in community-based efforts for children. The Healthy Tomorrows Partnership for Children Program is a cooperative agreement between the federal Maternal and Child Health Bureau and

the AAP, with federal grants awarded to support community-based child health projects that improve access to health services for mothers, infants, children, and adolescents.

Member Education

Recognizing that ongoing education of pediatricians is a cornerstone of promoting optimal care for children, one of AAP's major activities is continuing medical education (CME), with numerous opportunities for learning, including the annual National Conference and Exhibition and AAP's scientific journal, *Pediatrics* (which is printed in English and five other languages, including Chinese). Member pediatricians are offered printed and online learning products such as PREP: The Course. The AAP's online Pedialink service connects members to courses all over the country. The latest news from the organization is delivered through its monthly publication, *AAP News*.

Gina Steiner

See also Access to Healthcare; Child Care; Physicians; Primary Care; State Children's Health Insurance Program (SCHIP)

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American Academy of Pediatrics (AAP):
<http://www.aap.org>

AMERICAN ASSOCIATION OF COLLEGES OF NURSING (AACN)

The American Association of Colleges of Nursing (AACN) is a nonprofit institutional membership association dedicated exclusively to furthering nursing education in America's universities and 4-year colleges. The AACN represents schools of nursing at more than 600 public and private institutions of higher education. Its mission is to serve as the national voice of baccalaureate and graduate-degree nursing education. The association also includes the Commission on Collegiate Nursing Education (CCNE), which accredits baccalaureate and graduate nursing programs.

Background

In 1965, the American Nurses Association (ANA) took the position that nursing education should take place at institutions of higher education. At the time, most nurses were trained in hospital-based diploma programs. The ANA policy eventually led to the demise of hospital programs and the rise of associate and baccalaureate degree programs in nursing at colleges and universities. As a result, the AACN was formed in 1969 to establish quality standards for bachelor's and graduate-degree nursing education. It also assisted deans and directors of nursing programs to implement its standards and promoted public support of baccalaureate and graduate education of nursing.

Membership

The AACN is composed primarily of institutional members. Membership in the association is open to any institution offering a baccalaureate or higher-degree nursing program. The dean or other chief administrative nurse in the nursing program serves as the institutional representative in the association. Other categories of individual membership include the following: Emeritus, Honorary, and Honorary Associate. Individual membership is conferred at the discretion of the board of directors of the association.

Organization and Structure

An 11-member board of directors governs the AACN. Each of the members of the board represents a member institution. The board consists of four officers and seven members-at-large, all elected by the membership for 2-year terms.

Much of the association's work is conducted through the efforts of various committees and task forces, represented by nurse faculty and nurse leaders from across the country. Its committees include Finance, Government Affairs, Membership, Nominating, Program, and Project Evaluation and an educational benchmarking survey advisory group. Its task forces include Academic Careers, Clinical Nurse Leader, and Revision of the Essentials of Baccalaureate Nursing Education and a cultural competency advisory group.

Products and Services

The AACN is very active in terms of professional networking and providing key updates to its members concerning nursing higher education. To keep its membership informed, the association publishes the *Journal of Professional Nursing* six times a year for nurse educators, researchers, and practitioners and the *Syllabus*, a bimonthly newsletter that provides information and updates on the status of nursing higher education. It also holds semiannual meetings in Washington, D.C., offering nursing deans and faculty the opportunity to discuss important issues facing nursing legislation and education.

In 1996, the association established the Commission on Collegiate Nursing Education (CCNE). The CCNE, which is an autonomous arm of the association, has the sole purpose of accrediting baccalaureate and graduate nursing education programs.

Current Activities

The AACN continues to emphasize the need for baccalaureate education in nursing, versus an associate's degree in nursing or a nursing diploma. The association is also actively involved with health policy. It aggressively seeks federal funds for nursing education and research. It frequently

produces legislative updates on issues effecting nursing education. It tracks and monitors nursing bills in the U.S. Congress, and it often submits written congressional testimony. The association actively works with Congress and the federal government to increase funding of nursing workforce development programs, nursing graduate students, schools of nursing, academic health centers that provide nursing education, and loan programs to increase nursing faculty.

Michelle Choi Wu

See also American Nurses Association (ANA); Health Professional Shortage Areas (HPSAs); Health Resources and Services Administration (HRSA); Health Workforce; Hospitals; Nightingale, Florence; Nurse Practitioners (NPs); Nurses

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- American Nurses Association (ANA): <http://nursingworld.org>
- Bureau of Health Professions (BHPr): <http://bhpr.hrsa.gov/healthworkforce>
- National League for Nursing (NLN): <http://www.nln.org>

AMERICAN ASSOCIATION OF PREFERRED PROVIDER ORGANIZATIONS (AAPPO)

The American Association of Preferred Provider Organizations (AAPPO) is the leading national association of preferred provider organizations (PPOs) and affiliate organizations. It was established in 1983 to advance awareness of the benefits—greater access, choice, and flexibility—that PPOs bring to American healthcare. The AAPPO has 400 members representing 125 different organizations.

Definition and Popularity of PPOs

A PPO is a healthcare delivery system where providers contract with the PPO at various reimbursement levels in return for patient steerage into their practices and/or timely payment. PPOs differ from other healthcare delivery systems in the way they are financed and provide more choice, benefit flexibility, and enrollee access to providers and medical services both in- and out-of-network.

PPOs are widely popular with consumers and healthcare purchasers. In 2007, more than 158 million individuals in the nation were enrolled in a PPO program, which indicates that 64% of Americans with healthcare coverage receive their healthcare services through a PPO delivery system. The fact that PPOs have delivered exactly what the public has called for—choice, flexibility, and a balance between the delivery of appropriate care and cost control—is the primary reason for this strong market share.

Mission and Mandate of AAPPO

Since its inception, the AAPPO has been the only association advocating solely on behalf of PPOs and continues to lead the way in the promotion, support, and advocacy of the PPO industry. The association's vision is to continue to be the most-valued trade association for organizations that use, develop, and support PPO networks and products. Its mission is to advance and promote the PPO industry for AAPPO members and their stakeholders, providers, and consumers by (a)

informing and educating the public policy community about the PPO delivery model; (b) facilitating PPO best practices by developing and advancing PPO industry practices and guidelines; (c) promoting PPO networks and benefit products as the preferred healthcare solution; and (d) supporting professional growth through comprehensive PPO training programs to meet ongoing employee needs for organizations that use, develop, and support PPO networks and products.

The AAPPO prides itself in being responsive to its members and providing programs and activities to specifically support their business needs. The association promotes the visibility, clarity, awareness, value, and benefits of the PPO delivery model. These efforts educate and inform all marketplace sectors that regulate, use, and support the PPO delivery system. In this era of constant change, demonstrating the value the PPO model brings to U.S. healthcare is essential.

Specifically, AAPPO's mandate is (a) to provide PPOs with the information they need, when they need it; (b) to represent the industry's interests and concerns in government; and (c) to improve healthcare professionals' industry knowledge and business acumen through a variety of educational programs.

Providing Critical Information to PPOs

The AAPPO provides a broad array of information to meet PPO business needs and help PPOs achieve their goals. White papers and webinars are one source of information in which issues of the day are researched, analyzed, and summarized from the perspective of PPOs. Another source is RapidResource, a comprehensive source of PPO information. RapidResource is published annually and contains three critical products: (1) the market and industry trend report, which provides stakeholder perspectives on the industry; (2) current statistics and trends; and (3) insightful analysis and future strategies for PPOs. The PPO DataSource is a national database, including executive contact information, office locations, and more. The directory of operational PPOs is a quick online connection to find the location, geographic coverage, and specific details of any PPO nationwide. The AAPPO also organizes the Annual Forum, an informational

and networking conference where attendees can exchange ideas, share perspectives, and discuss solutions specific to PPOs. Another type of information is iState, which monitors state regulation and legislation in all 50 states and provides the information in an online, sortable format.

Advocating for PPOs

The AAPPO represents the industry's interests and concerns in legislative and regulatory issues in several ways. Capital Caucus is an annual event in Washington, D.C., used to facilitate two-way exchange between policymakers and the administration and PPO business leaders. Through its legislative outreach, the AAPPO continually educates individuals in the national and state regulatory arena about PPO business practices. With membership in healthcare coalition and programs, the benefits and value of the PPO healthcare delivery model are represented within healthcare coalitions and other healthcare programs. The AAPPO also provides state-level advocacy, in which it monitors and acts on critical issues occurring at the state level.

Educating PPO Professionals

The AAPPO is dedicated to advancing the education of healthcare professionals. In addition to the information provided to members, the association has also developed the academy, a high-quality, online education program. Students learn at their own pace, anywhere they can access a computer with an Internet connection. Courses include an overview of the PPO industry as well as in-depth courses related to four key study areas: (1) customers, (2) medical management, (3) providers, and (4) claims. The association's academy bestows certifications to students who successfully complete all required classes in a study area.

Organization and Committee Structure

The AAPPO has established a number of innovative committees to serve as working groups to pursue areas of specific interest to the association and its members. These committees meet electronically

and in person throughout the year to help further the mission of the association. The association's committee members work to set the association's public policy goals, guide communication initiatives, and identify and address important issues. The Business and Membership Development Committee works to promote the association's business initiatives and recruitment goals. The Education Advisory Committee is responsible for the oversight of course curriculum, course development, and policies and procedures to support the association's Academy. The Medical/Provider Affairs Committee develops the association's policies on issues relating to building and maintaining effective relationships with providers and their representative organizations. The Political Action Committee (PAC) is crucial for building relationships with state and federal legislators, and it educates the association's membership about the fundamental operations of the PAC and the importance of contributing to it. The Public Policy Committee supports the association's goal to educate policymakers about the PPO industry and the unique role PPOs play in the healthcare delivery system. The Rules, By-Laws and Nominations Committee provides oversight for the association's governance, rules, and nominations. The Executive Committee, Compensation Committee, and the Audit Committee provide support to the board of the association.

Lynn Huls

See also Access to Healthcare; Healthcare Financial Management; Health Insurance; Hospitals; Managed Care; Physicians; Preferred Provider Organizations (PPOs); Public Policy

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AMERICAN COLLEGE OF HEALTHCARE EXECUTIVES (ACHE)

The American College of Healthcare Executives (ACHE) is an international professional society of more than 30,000 healthcare executives who lead hospitals, healthcare systems, and other healthcare organizations. The ACHE's mission is to advance its members and healthcare management excellence through high ethical standards, pertinent knowledge, and a relevant credentialing program. While achieving this mission, the organization promotes the values of integrity through high ethical conduct, and lifelong learning by innovation and continuous organizational and professional improvement, leadership training by example and mentorship, and diversity via inclusion and embracing the differences of its members and of the healthcare communities served.

History

ACHE was originally founded in 1933 as the American College of Hospital Administrators. The founders of the society were concerned that individuals with little or no training or experience in hospital administration were managing many of the nation's hospitals. The goal of the society was to elevate the standards of competence of hospital administrators through the process of education and training. In 1985, the society's name was changed to the American College of Healthcare Executives to more accurately describe its diverse membership and its expanded scope.

Structure and Leadership

The ACHE membership is divided into six districts: five geographical districts and a sixth district composed of military affiliates. Within the

six districts, there are 53 locally led chapters. Two affiliated groups, (1) the Women's Healthcare Executive Networks (WHENs) located in the United States and (2) the Healthcare Executive Groups (HEGs), represented in India, Mexico, Saudi Arabia, Turkey, and the United Arab Emirates, were established, along with local chapters, to provide members access to networking, education, and career development at the local level and to address local, national, and international healthcare management needs.

The central office of ACHE is located in Chicago and houses the administration, including the president and chief executive officer, executive vice president, and other vice presidents of the organization.

The chapter board or board of directors is composed of annually elected officers and directors from each chapter. The chapter board manages general chapter operations and ensures that the chapter meets its goals and objectives. The board of governors, also elected and voluntary, operates like a traditional board of directors in that it has the authority to manage and control the affairs and funds for the overall organization. The highest organizational authority resides with the Council of Regents, which provides guidance and advice for the board of governors, representing the members and chapters. The Council of Regents has eight specific powers, including the right to elect the chairman, officers, and members of the board of governors and to approve or to disapprove recommendations, reports, actions, or resolutions placed before the council.

Membership and Credentialing

The eight categories of membership in ACHE are those of (1) Members, (2) Fellows, (3) Life Fellows, (4) Honorary Fellows, (5) Student Associates, (6) Faculty Associates, (7) International Associates, and (8) Retired Affiliates. A professional certification designated by ACHE is as a Fellow of the American College of Healthcare Executives (FACHE). To become board certified in healthcare administration as a FACHE, members must pass the Board of Governors Examination in Healthcare Management as well as fulfill other rigorous

requirements such as completing 40 hours of continuing education credit, 3 years of tenure as an ACHE member, 5 years of healthcare management experience (with a postbaccalaureate degree, 8 years if applying without) and demonstrating participation in civic and leadership activities.

Education

ACHE is well-known for organizing and sponsoring educational events, such as the annual Congress on Healthcare Leadership, which draws approximately 4,000 participants each year. Quality improvement, physician relations, information technology, and governance are examples of topics covered at the ACHE Congress. It is through the Congress on Healthcare Leadership, conferences, seminars, and special programs, such as the Board of Governors Examination Review Course and the Senior Executive and Leadership Development Institutes, that ACHE provides its members with continuing education and national networking opportunities. Distance-learning options such as audio/Web conferences, online seminars, self-study courses, and audio conference CDs are also available.

Publishing

The Health Administration Press (HAP) is a division of the Foundation of the American College of Healthcare Executives. Founded in 1972 with support from the W. K. Kellogg Foundation, the HAP is one of the largest publishers of books and journals on all aspects of health services management, including textbooks for use in undergraduate and graduate courses. The press also publishes the *Journal of Healthcare Management*, *Frontiers of Health Services Management*, and *Healthcare Executive Magazine*. It also produces courses for the ACHE Self-Study Program.

Career Services

ACHE's Healthcare Executive Career Resource Center (HECRC) offers career services, including leadership assessment tools, career development programs and resources, and personalized

career-planning assistance. Additionally, HECRC offers guidance in mentoring and executive coaching.

Policy Campaigns

ACHE encourages its members and affiliates to advocate organ and tissue donation through the U.S. Department of Health and Human Services' Gift of Life program. Because ACHE also recommends that all healthcare executives work to support access to healthcare services for all people, ACHE is raising awareness through two programs: (1) Covering Kids & Families and (2) Cover the Uninsured Week.

Public policy statements are developed at the ACHE committee level that address current issues such as executive responsibility (a) to foster healthcare access, (b) to serve the community, (c) to ensure organizations are following emergency preparedness plans, and (d) to strengthen healthcare employment opportunities for persons with disabilities.

Research

ACHE conducts research on a number of healthcare management areas, including factors affecting the career attainments of healthcare executives as well as trends and recommended practices affecting the profession. Topics of study outcomes recently addressed include a comparison of the career attainments of men and women healthcare executives, top issues confronting hospitals, and the impact of hospital chief executive officer turnover in U.S. hospitals.

Laurie A. Hensley

See also American Hospital Association (AHA); Diversity in Healthcare Management; Healthcare Financial Management; Hospitals

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AMERICAN ENTERPRISE INSTITUTE FOR PUBLIC POLICY RESEARCH (AEI)

The American Enterprise Institute for Public Policy Research (AEI) is a private, nonpartisan, not-for-profit organization dedicated to the research of government, economic, political, and social welfare issues. Located in Washington, D.C., AEI's purpose is to preserve and strengthen the foundations of freedom—limited government,

private enterprise, vital cultural and political institutions, and a strong foreign policy and national defense—through scholarly research, open debate, and publications.

History

Founded in 1943, the AEI is home to some of America's most accomplished public policy experts. AEI scholars strive to elevate the public policy debates regarding the nation's most pressing issues, educate the public, and contribute sound recommendations for reform. Their research is disseminated to a broad audience of domestic and international policymakers, academics, business executives, the media, and the general population, through various publications, conferences, seminars, working groups, and government testimony.

The AEI employs nearly 190 individuals and works with approximately 70 adjunct scholars. The institute's work is supported through financial contributions from foundations, individuals, and corporations as well as through earnings from an endowment. The AEI's president, in consultation with the institute's Council of Academic Advisers, sets its research agenda. In addition, each year, the Council of Academic Advisers awards AEI's Irving Kristol Award to an individual who has made a notable contribution to improving public policy and social welfare.

The AEI has three main research divisions: (1) Economic Policy Studies, (2) Social and Political Studies, and (3) Defense and Foreign Policy Studies. There are also several specialized programs, among them the W. H. Brady Program on Culture and Freedom, the National Research Initiative, the AEI Press, and *The American* magazine.

Health Policy Studies Program

One of the AEI's most important research efforts is its Health Policy Studies Program. AEI sponsors a robust program of original research to address some of the most contentious issues in the current health policy debates, such as costs, economic incentives, the role of government and the market, and the medical well-being of patients. AEI's health policy scholars possess a

wealth of knowledge and experience, along with extensive worldwide contacts among policymakers, academics, and business executives. Several of the program's experts have served in top positions in various parts of the federal government and the U.S. Congress, including the Food and Drug Administration (FDA), the Centers for Medicare and Medicaid Services (CMS), the President's Council of Economic Advisers (CEA), the U.S. Department of Health and Human Services (HHS), and the Congressional Budget Office (CBO).

Scholars in the AEI's Health Policy Studies Program have been among the leaders in the recent debates on Medicare reform, the reimportation of prescription drugs, health coverage for the uninsured, the role of the FDA, the development of vaccines, and the effects of price controls on pharmaceutical research and development. AEI health policy scholars, along with a network of academic experts at affiliated universities and institutions across the country and abroad, will likely continue to make major contributions to these and other debates. They aim to (a) establish a healthcare and public health agenda centered on the themes of competitive markets, personal choice, and progress in science, technology, and practice; (b) construct reform proposals that apply the best economic thinking to the dynamics of healthcare; and (c) provide policymakers, the media, and the broader public with an objective assessment of the private sector's contributions to innovation in the delivery and financing of medical care and insurance coverage.

The AEI's health policy scholars work at the juncture of policy and practice. They strive to improve government policy through scholarly research, and an array of publications, conferences, seminars, as well as through discussions with government officials, academic experts, and industry leaders. Their work has helped to shape—and will likely continue to shape in the years to come—important policy debates.

Véronique Rodman

See also Centers for Medicare and Medicaid Services (CMS); Cost of Healthcare; Health Economics; Health Insurance Coverage; Medicare; Pharmaceutical Industry; U.S. Food and Drug Administration (FDA)

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AMERICAN HEALTH CARE ASSOCIATION (AHCA)

The American Health Care Association (AHCA) is a federation of affiliated state health organizations, together representing more than 10,000 nonprofit and for-profit assisted living, nursing homes, developmentally disabled, and subacute-care providers that care for more than 1.5 million individuals in the nation. The AHCA represents the long-term care community to government, business, and the general public. It also serves as a force for change within the long-term community, providing information, education, and administration tools.

Background

Since 1949, the AHCA has been working to improve the standards of the long-term care profession and to promote a better understanding of what constitutes a supportive, quality-focused care environment. Since its founding, the AHCA's objectives have remained consistent, with only minor changes. Specifically, the association's objectives, which were codified in 1946, include improving the standards of service and administration of member nursing homes; securing and meriting public and official recognition and approval of the work of nursing homes; and adopting and promoting programs of education, legislation, better understanding, and mutual cooperation.

Together with its 50 state affiliates and in concert with other key stakeholders, the AHCA currently seeks to encourage (a) a stable financing system that enhances long-term care quality; (b) an oversight system that is fair, consistent, and rewards quality; and (c) a workforce that can meet the growing needs of the long-term care profession and the nation.

Products and Services

In 2002, the AHCA helped launch Quality First, a profession-wide quality improvement initiative. Quality First was followed by the Centers for Medicare and Medicaid Services' (CMS) Nursing Home Quality Initiative (NHQI), which began to track progress on specific clinical measures of nursing home care quality. In 2006, the association cofounded and is leading a coalition of healthcare providers, caregivers, medical and quality improvement experts, government leaders, consumers, and other stakeholders who are working to improve care quality through the voluntary Advancing Excellence in America's Nursing Homes campaign. Advancing Excellence is a quality initiative that is designed around measurable quality goals, which are supported by the campaign's coalition of providers, caregivers, consumers, and key stakeholders. More than 6,600 providers—predominantly AHCA members—already participate in this important initiative, which the association and its state affiliates strongly endorse.

The AHCA relies on its members' clinical expertise, especially members of their Clinical Practice Committee, to guide the association's efforts to ensure that long-term care settings have the most appropriate clinical protocols and Web site resources. The association also collaborates with a variety of key partners and clinical experts in promoting best practices. For example, the association partnered with the Alzheimer's Association to improve clinical-care standards. This partnership resulted in the Alzheimer's Association issuing its publication *Dementia Care Practice Recommendations for Assisted Living Residences and Nursing Homes*, which focuses on end-of-life care.

Whether the AHCA is working with other healthcare professionals on clinical issues, with the federal government on initiatives to enhance quality, or with the U.S. Congress to preserve much-needed funding for long-term care and services, the association recognizes that 80% of long-term care residents rely on Medicare and/or Medicaid to pay for the care they need. This means that the organization's membership cares for some of our country's most vulnerable citizens. In fact, the average nursing home resident is an 85-year-old grandmother with cognitive or functional impairments and multiple comorbidities that typically require nine medications per day. With this membership in mind—along with the fact that 77 million baby boomers are edging toward retirement—the AHCA remains focused on ways to create a better, more stable workforce that can meet the growing needs of all healthcare consumers.

The AHCA actively works to educate elected officials and their staff members about the long-term care needs of America's seniors so that our "Greatest Generation" and others will continue to have access to the most appropriate care in the most appropriate setting. The AHCA's legislative team also calls on policymakers and government officials from the White House, the Centers for Medicare and Medicaid Services (CMS), the U.S. Department of Health and Human Services (HHS), the Department of Labor (DOL), and congressional offices on both sides of the aisle to address the many challenges confronting today's long-term care system.

Underpinning the association's education and advocacy efforts are several important

components—public affairs and both grassroots and grass-tops outreach. The association’s public affairs team directs positive media attention to the work of its membership and generates media interest that supports its advocacy, which can spur on its quality and other initiatives. The organization’s grassroots and grass-tops supporters assist the advocacy arm and allow the association’s legislative and public affairs teams to demonstrate just how important each member is to the collective advocacy agenda. One of the grassroots activities that the association promotes with its membership is the facility tour. A facility tour is an extremely effective way for providers to educate U.S. congressional members about long-term care and related issues. Touring a facility also presents a positive media opportunity—for the facility, for the elected official, and for the long-term care profession.

The AHCA’s political action committee (AHCA-PAC) adds even more depth to its advocacy efforts. AHCA-PAC hosts a number of fund-raising events and has helped establish several mini-PACs that concentrate on more regional and state-level PAC outreach.

The AHCA and the National Center for Assisted Living (NCAL) continue to join forces to promote member communication as well as increase the number of positive stories about long-term care in the mainstream news media. Member feedback has also helped shape some of the communications, including a recent Web redesign and upgrades to the association’s management system, which will further enhance AHCA staff’s ability to serve its membership better.

The AHCA’s public affairs team also ensures that long-term care has a presence in major newspapers and broadcast media throughout the year. The association has been quoted or featured in *The New York Times*, *The Wall Street Journal*, and *The Washington Post* as well as numerous local newspapers. The AHCA has contributed to national news programs as well, including *NBC Nightly News*, the *CBS Evening News*, and PBS’s *Nightly Business Report*.

Katherine Lehman

See also Disability; Long-Term Care; Long-Term Care Costs in the United States; Medicaid; Medicare; Nursing Home Quality; Nursing Homes; Skilled-Nursing Facilities

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Web Sites

- Advancing Excellence in America’s Nursing Homes:
<http://www.nhqualitycampaign.org>
- Alzheimer’s Association (ALZ): <http://www.alz.org>
- American Health Care Association (AHCA):
<http://www.ahca.org>
- National Center for Assisted Living (NCAL):
<http://www.ncal.org>

AMERICAN HEALTH PLANNING ASSOCIATION (AHPA)

The American Health Planning Association (AHPA) is a national organization whose members are agencies and individuals engaged in some aspect of the broad and sometimes controversial field of health planning and capacity regulation, such as Certificate of Need (CON). Since its founding in 1971 (as the American Association of Comprehensive Health Planning, and it changed

its name to the present in 1977), the membership, focus, and activities of the association have shifted, reflecting the changing scope and role of health planning in the United States. Today, the association is perhaps best known for its Web site and annual publication of a directory of state CON programs.

The Rise of Health Planning

When the AHPA was founded, health planning was starting to be viewed by national policymakers as offering a possibility of both slowing down the escalating rise in healthcare costs and ensuring that healthcare resources were better allocated based on community need. Health planning had been in place on a smaller scale since the early 1960s, when Kodak and Blue Cross and Blue Shield formed a joint effort in Rochester, New York. It was also part of several federal health programs and adopted by a number of states as both a regulatory and voluntary measure to control the expansion of institutional healthcare services, most frequently hospitals and nursing homes. Most prominent among the early federal programs was the Partnership for Health Act of 1966, which set up a network of state-level (Comprehensive Health Planning CHP-A) and within-state regional (Comprehensive Health Planning CHP-B) voluntary health-planning agencies. At the state level, New York led the way on both the regulatory and voluntary planning fronts by enacting the first state CON legislation, and in the Rochester area, a council of hospital and industry attempted to plan the expansion of hospital services to meet community needs.

As health planning gained momentum, representatives from these scattered experiments formed the AHPA to create a focus and organize a professional movement to support health planning. The association was organized around several principles common to most health-planning efforts that are still in place today: (a) community participation in decision making regarding the allocation of healthcare resources; (b) equity in access to healthcare services regardless of income and insurance status; (c) the use of population need as the underlying rationale for deterring the quantity and location of healthcare resources;

(d) a balanced and more holistic view of healthcare that recognizes that an effective healthcare system requires a wide range of services from basic primary care to technologically sophisticated and highly specialized services; (e) a concern for the efficient delivery of healthcare and cost containment; and (f) a necessary role for the legislative policy process at the federal and state government levels.

National Health Planning Program

Health planning reached its full maturity in the United States with the passage of the National Health Planning and Resource Development Act of 1974. PL 93-641, as it came to be known in health-planning circles, established a federally directed system of 50 state and more than 200 local health systems agencies (HSA), each with regulatory authority to conduct health planning enforced by state-level CON laws and federal regulations. The law tasked the U.S. Department of Health, Education, and Welfare (DHEW) (forerunner of the U.S. Department of Health and Human Services [HHS]) to develop extensive national guidelines for how the health-planning agencies were to be composed, operate, and make decisions.

The AHPA's membership grew dramatically during this period, with many members coming from newly established health-planning agencies. Driven by PL 93-641, AHPA took on the role of a professional trade association focusing much of its efforts on lobbying the U.S. Congress in support of continuing federally sponsored and funded health planning, along with monitoring rules issued by DHEW on how the health-planning law should be implemented. Beyond the focus on federal health planning, the AHPA also served as a clearinghouse for state-level CON laws, advanced the development and use of health-planning technical methods, and became a forum for the growing number of health planners across the nation. The forum function culminated each year with a national conference that often drew hundreds of health planners, planning agency directors and board members, academics, and healthcare administrators along with lawyers and consultants involved in a cottage industry, which specialized in assisting healthcare institutions navigating the approval process for

expansion, new construction, and purchase of expensive medical technology.

During this period, membership in the association gravitated to several spheres of interest: (a) national health policy and the role of a federal health-planning program; (b) health planning as a mechanism for community involvement in health system decisions; (c) the technical aspects of health planning; and (d) the use of data and analysis in decision making.

After National Health Planning

As the 1970s drew to a close, federal health planning fell out of favor with national policymakers as a more conservative political climate took hold, and the use of market mechanisms to control healthcare costs and structure the healthcare system gained support. The AHPA found itself fighting a losing political battle to save the national health-planning program and PL 93-641 was repealed at the urging of the Reagan Administration in 1986. Without the federal sponsorship and funding, many state and local health-planning agencies closed, redirected their efforts, or were absorbed into related organizations. The retrenchment was most dramatic at the local level, where the majority of local health-planning agencies simply disbanded.

The lack of a federal health-planning program and the demise of many health-planning agencies both reduced the membership base of the association and changed its focus. The change in membership was most dramatic in the loss of organizational members, formerly the federally sponsored local health systems agencies and state health-planning and development agencies. The association's membership became less institutional, and the association became more a professional society of individuals working or having an interest in health planning. CON, which was retained in some form by almost three quarters of the states as a regulatory remnant of national health planning, took on a heightened focus of the association as state CON directors and their senior staff looked to it as the principal national forum for this state-sponsored regulatory activity.

The AHPA became a strong defender of CON after a far-reaching and critical federal report was released in 2004 (*Improving Health Care: A Dose*

of Competition, authored by the Federal Trade Commission and the U.S. Department of Justice), which called for its elimination. One of the association's major activities is the publication of an annual national directory, which inventories each state's CON program.

Beyond CON, the association's leadership also sought to rediscover and promote the broader value of health planning reflected in its original principles and to document the need for health planning to deal with the growing national concern that the healthcare system was under great strain. The broader interest overlapped into public health, and the association sought a closer affiliation with the American Public Health Association's Community Health Planning and Policy Development (CHPPD) section, whose members shared AHPA's interest in health reform and population health.

Today, the AHPA and the CHPPD section regularly cosponsor professional presentations at the American Public Health Association's annual meeting, and they jointly publish a bibliography on health planning. The AHPA continues to serve as a forum for health planning in all its diverse forms. The association maintains an active board of directors, but its presence is largely through its Web site, where health-planning activities from across the nation are tracked and reported; issue papers on health planning, regulation, and public health are posted; and informational resources relevant to health planning are linked.

Patrick Lenihan

See also American Public Health Association (APHA); Certificate of Need (CON); Health Planning; Health Systems Agencies (HSAs); Hospitals; Public Health; Regulation; Technology Assessment

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<http://www.ahrq.gov>
- American Health Planning Association (AHPA):
<http://www.ahpanet.org>
- American Public Health Association (APHA):
<http://www.apha.org>

AMERICAN HOSPITAL ASSOCIATION (AHA)

The American Hospital Association (AHA) is a nonprofit organization that aims to improve the health of individuals and their communities. The AHA represents, leads, and serves the institutions that deliver medical care. Its institutional membership includes nearly 5,000 of the nation's hospitals—almost 90% of all registered hospitals—as well as healthcare networks and other patient-care facilities. Its individual membership includes 37,000 health professionals such as risk managers, engineers, social workers, and nurse executives, who join through approximately 15 different personal membership groups or professional societies.

History

The AHA was founded in 1899 as the Association of Hospital Superintendents by eight hospital administrators in Cleveland, Ohio. Their purpose for establishing this association was to develop a vehicle for discussion, analysis, and resolution of common concerns and issues regarding managing a hospital. In 1906, the membership was expanded beyond hospital chief executives, and the name of the organization was changed to the American Hospital Association. In 1918, institutional membership was established.

Historically, the AHA's actions have reflected the dual mission of achieving economy, efficiency, and solvency in hospital management and providing better hospital care for all. In response to the public's inability to pay for hospital care as a result of the Great Depression, the AHA recognized a need and defined a set of principles for hospital insurance plans in 1937, which later became

known as Blue Cross. In 1942, the AHA spearheaded the establishment of the Commission on Hospital Care, which led to a huge program of hospital construction known as Hill-Burton. The AHA supported efforts to pass the Medicare legislation of 1965, which covered hospital care and other services for the nation's seniors.

The cost of medical care is a major concern for the AHA today. The United States spends more on medical care than does any other nation, and hospital care alone accounts for the largest portion of spending—about one third. Factors associated with these costs include new treatments and technology and greater demand. In addition to the increased costs to provide care, hospitals often do not get paid for the care they provide. Many of the nation's hospitals report losing money serving Medicare and Medicaid patients.

The AHA has changed significantly since its inception. It has evolved from a small club for hospital administrators to an effective and forceful advocate for the nation's hospitals. To achieve its goals and serve its constituents, the AHA generates, collects, uses, and shares an important body of healthcare-related information.

Size and Structure

When it was first founded as the Association of Hospital Superintendents, the AHA was located in Cleveland, Ohio. Although subsequently the organization was briefly headquartered in Washington, D.C., since 1920 the AHA's headquarters have been located in Chicago, Illinois. An office in Washington, D.C., was also established to secure better access to federal agencies for advocacy, policy, and communication initiatives.

The AHA's services and policies are determined by a governing structure that includes a board of trustees, a house of delegates, and nine regional policy boards. The role of the regional policy boards, comprising state hospital association executives, is to debate and analyze important healthcare policy issues from a local perspective prior to submitting the issues to the house of delegates for consideration.

The house of delegates comprises members from state associations as well as constituency sections. State associations are apportioned delegates to the

house based on the amount of dues paid by the institutional members in each state. The constituency sections also shape policy and represent special interests among hospitals. These sections include Health Care Systems, Small or Rural Hospitals, Metropolitan Hospitals, Federal Health Systems, Long-Term Care and Rehabilitation, Psychiatric and Substance Abuse Services, and Maternal and Child Health. After debates within the house, it is the responsibility of the board of trustees to exercise its final decision-making authority over the formal adoption and execution of AHA policy.

The AHA is broadly organized into the following units: (a) advocacy and public policy, (b) leadership and business development, (c) strategic policy planning, (d) member relations, (e) federal relations, and (f) strategic communications. The AHA has also established numerous subsidiary organizations that are critical to its business: (a) The Health Forum; (b) AHA Financial Solutions, Inc.; (c) the Center for Healthcare Governance; (d) the Health, Research and Educational Trust; (e) the American Organization of Nurse Executives; and (f) the Institute for Diversity in Health Management. The Health Forum encompasses the publishing, data, and education activities of the AHA. AHA Financial Solutions, Inc., maintains a comprehensive portfolio of financial products such as insurance and investment vehicles for members. The Center for Healthcare Governance builds stronger and better hospital boards. The purpose of the Health Research and Educational Trust is to conduct innovative research on issues related to effective, strategic, and improved healthcare delivery that significantly affect the health of the community. The American Organization of Nurse Executives is a professional association for nurses in leadership and management positions. The Institute for Diversity in Health Management works to achieve diversity in healthcare settings.

To provide education and serve as a source of information for healthcare leaders, the AHA maintains a resource center. This unit responds to the information needs of its members, libraries, the public, healthcare researchers, and others on a broad range of healthcare issues such as health professional planning, healthcare financing, and regulatory issues by providing statistical and analytic reports and documents. The resource center

maintains an extensive library with collections on health administration, including more than 64,000 books and historical documents.

Products and Activities

The AHA's products and activities are concentrated within two different arenas: (1) policy and advocacy and (2) data and information.

The AHA spends approximately \$15 million a year on advocacy. The AHA has identified many important issues affecting the nation's hospitals. Some of the key issues are listed below.

With approximately two thirds of the nation's hospitals getting paid less than it costs to care for Medicare patients, the AHA seeks to achieve increased Medicare payments to hospitals. Similarly, the AHA opposes payment cuts to hospitals under the Medicaid program.

With the uninsured using the nation's hospitals as their primary source of care, the AHA is working to extend healthcare access and coverage to the uninsured. Furthermore, the AHA supports medical liability reform to prevent further deterioration in patient access to care.

Given recent concerns that nonprofit hospitals are not providing sufficient charity care, the AHA is working to clarify and improve hospital billing and collection standards.

The AHA advocates the creation of a better healthcare system. For example, since providing care to individuals with chronic diseases is increasingly costly and fragmented, the AHA supports changes in the payment system that reward coordination of care. Also, the AHA supports eliminating racial and ethnic health disparities in medical-care treatment and outcomes. Finally, underscoring the immense potential of health information technology to improve the quality of care, the AHA is seeking regulatory relief and increased funding for the nation's hospitals for health technology improvements.

The AHA is pursuing continued funding to achieve disaster and emergency readiness among the nation's hospitals.

The AHA is working to facilitate the adoption of new standards for the management of patient health information as embodied in the Health Insurance Portability and Accountability Act of 1996 (HIPAA).

The AHA offers many data- and information-related products. Among its many management publications are *Health Facilities Management*, *Hospitals & Health Networks*, *H&HN's Most Wired Magazine*, *Materials Management in Health Care*, and *AHA News*, a weekly newspaper for hospital managers. The AHA also produces materials related to patient education, staff development, and many other areas related to hospital administration.

The AHA's research and statistical publications include the journal *Health Services Research* and two annual reports, the *Guide to the Health Care Field* (a detailed listing of all hospitals in the nation) and *AHA Hospital Statistics* (a detailed statistical report for states and geographic regions in the nation). In addition, the AHA publishes (in collaboration with Avalere Health) *TrendWatch*, a series of reports that explore trends affecting hospitals and the healthcare system. The AHA serves as the official U.S. clearinghouse on medical coding for the proper use of the ICD-9-CM systems and Level I HCPCS (CPT-4 codes) for hospital providers. The AHA also publishes a variety of research reports and papers on special topics such as the healthcare system, information technology, financial issues, and workforce issues.

Penny L. Havlicek

See also Blue Cross and Blue Shield; Healthcare Financial Management; Health Insurance; Health Insurance Portability and Accountability Act of 1996 (HIPAA); Hospitals; Public Policy; Uncompensated Healthcare; Uninsured Individuals

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Web Sites

American Hospital Association (AHA):
<http://www.aha.org>

AMERICAN MEDICAL ASSOCIATION (AMA)

The American Medical Association (AMA) is a nonprofit organization that seeks to promote the art and science of medicine and the betterment of public health. The AMA works to “help doctors help patients” through aggressive advocacy of important healthcare issues, publishing an extensive series of medical journals, and providing its membership a variety of professional programs and activities designed to facilitate the practice of medicine. One of the most influential professional associations of physicians in the United States, the AMA includes about one fourth of all U.S. physicians as its members and spends more than \$15 million a year on its lobbying efforts. Through its main policy-making body, the House of Delegates, the AMA gives voice to issues affecting all physicians.

History

The AMA was founded in 1847 to advance the scientific disciplines, define and improve the standards in medical education, establish a code of medical ethics, and improve the public's health. It was officially incorporated in 1897. Founded as a result of a resolution calling for a national medical convention that was submitted to the Medical Society of the State of New York by Dr. Nathan Smith Davis (1817–1904), the initial meeting of the AMA was attended by 250 physicians representing 28 states. From the onset, membership in the AMA was voluntary.

The AMA became established as a viable institution around the turn of the 20th century. At this time, a new structure of internal governance was implemented that relied on the election of an apportioned number of delegates from each state medical society. Each state medical society in turn was supported by county medical societies. This change in governance structure served to ultimately

unify, enable, and effectively organize the nation's medical profession.

The membership of the AMA has grown from around 8,000 to 10,000 in 1900 to approximately 245,000 today. During the 1960s, the membership market share of the AMA reached its zenith, representing about 70% of the nation's physicians. The profusion of national specialty medical societies has been cited as one of the reasons for the AMA's decline in membership market share over the past several decades, with more physicians preferring to join societies representing their specific specialty rather than the entire profession. Responding to these membership trends, in 2004 the AMA launched a national advertising campaign for the first time in its history.

The AMA has always taken strong positions on a range of healthcare policy issues that it has believed protect physicians, their patients, and the practice of medicine. Examples of issues it has championed throughout the years are (a) advocating against the use of patent medicines or nostrums of dubious content and effectiveness (1900); (b) recommending nationwide polio vaccines (1960); (c) opposing tobacco use (1971); (d) opposing discrimination against AIDS patients (1987); and (e) supporting the Patients Bill of Rights legislation (2000). The AMA was a primary force in establishing the accrediting authority for physician medical education programs, and in 1942, the Liaison Committee on Medical Education and today, along with the Association of American Medical Colleges (AAMC), continues to sponsor the work of the Liaison Committee. The AMA also had an important role in establishing the Joint Commission, an organization that evaluates and accredits approximately 15,000 hospitals, nursing homes, group practices, ambulatory-care centers, hospice services, and laboratories.

A consistent priority for the AMA has been protecting physician sovereignty—that is a physician's right and authority to determine how he or she practices medicine. Reflecting this concern, the AMA opposed in the early 1900s a form of medical practice called “contract” practice. Similar in concept to the health maintenance organizations (HMOs) of today, contract practice physicians agreed to care for a defined group of patients in return for a specified amount of money. The AMA also initially opposed the establishment of Medicare

in 1965, concerned about government's intrusion into medicine. Today the AMA is advocating for Medicare Physician Payment reform, as the current payment formulas are expected to lead to pay cuts for physicians and reduced access to care for the nation's seniors.

Given the AMA's size and influence, sometimes the positions it takes to protect the practice of medicine generate controversy. For example, the AMA has confronted the Sherman Antitrust Act several times in its history: once in the 1940s for hindering and obstructing the business of an HMO, the Group Health Association, Inc., and once in 1987 in its attempt to boycott chiropractors on the grounds that the science on which that profession was based was neither rigorous nor sound. More recently, the AMA's decision in 1997 to accept payment for endorsing commercial healthcare products without testing them generated much debate within the medical profession and the media on the subject of medical ethics.

Size and Structure

The AMA's headquarters are located in Chicago, where it employs around 1,000 individuals. It maintains an office in Washington, D.C., that focuses on advocacy and government relations, and it also maintains an office in New Jersey that focuses on its publishing operations.

The AMA is organized into five general areas: (1) membership, (2) business operations, (3) core operations, (4) governance, and (5) administration and operations. Membership units focus on recruiting and retaining physician members. The business operations units include publishing, database maintenance and products, consumer books and products, and the AMA Insurance Agency. The core operations units focus on developing policy and establishing professional standards, including those related to medical education, public health and medical ethics; advocacy at the private sector, state, and federal levels and research to support that advocacy; maintaining relationships with state, county, and specialty societies; and marketing and communications. The governance units include serving and supporting the AMA's Board of Trustees and the House of Delegates. Last, the administration and operations units provide

administrative and operational support for other AMA units.

The AMA's governing structure is a federation, with separate medical societies supporting and contributing to the political whole. Elected representatives from state medical societies, national medical specialty organizations, and the federal health services sit in the AMA's House of Delegates. Each society is allocated a number of representatives based on its level of AMA membership. The House of Delegates is the principal policy-making body of the AMA, debating and voting on resolutions submitted by its representatives, which in turn provide direction for its programmatic efforts.

Other bodies also shape the policy and direction of the AMA. Elected by the House of Delegates, the AMA's Board of Trustees oversees and guides its activities. Five different councils help shape policy and focus on one of the following issues: medical ethics, long-range planning, medical education, socioeconomic issues affecting the practice of medicine, and medical, public health, and scientific issues affecting medicine. The AMA also incorporates the views of special groups or sections of physicians, including medical students, resident physicians, young physicians, organized medical staff, group practice physicians, women physicians, minority physicians, international medical graduates, senior physicians, medical schools, and gay, lesbian, bisexual, and transgender physicians.

Products and Activities

Although considerable AMA activity is devoted to membership development and retention, its most visible products and activities involve information and advocacy.

The AMA is one of the largest publishers of medical information in the world. Its flagship publication, the *Journal of the American Medical Association (JAMA)* is published in 10 languages, and print editions are circulated in 113 countries. In addition, the AMA publishes nine specialty journals, called the Archives Journals (*Archives of Dermatology*, *Archives of Facial Plastic Surgery*, *Archives of General Psychiatry*, *Archives of Internal Medicine*, *Archives of Neurology*, *Archives of Ophthalmology*, *Archives of Otolaryngology—Health and Neck*

Surgery, *Archives of Pediatrics and Adolescent Medicine*, and the *Archives of Surgery*), which are also available in print editions internationally. Both *JAMA* and the Archives Journals are peer reviewed and available online. *JAMA* is published weekly, while the Archives Journals are published on a monthly or bimonthly basis. In addition to its journals, the AMA publishes a newspaper for physicians called *American Medical News*.

Other AMA products and services include resources that support professional development and facilitate the practice of medicine. For example, the AMA publishes *Current Procedural Terminology (CPT)*, the guidebook for physicians' offices on how to correctly classify and code medical procedures for appropriate reimbursement from Medicare. The AMA offers online continuing medical education programs. It publishes a variety of directories related to graduate medical education and hosts online a *Fellowship and Residency Electronic Interactive Database (FREIDA)* for medical students and residents to research and compare the characteristics of residency programs. It also publishes a wide variety of medically related books on topics such as guides impairment resources, health, medical law and ethics, practice management, and career development. The AMA disseminates its policy positions through an online database called PolicyFinder.

An important resource that supports a variety of the AMA's products and services, such as its membership development efforts, marketing activities, and outreach programs, is the AMA Physician Masterfile. The Physician Masterfile is a large database that includes biographic, medical education and training, contact, and practice information on more than 800,000 physician records. In cooperation with the Association of American Medical Colleges (AAMC), data are collected on individuals from medical school through residency training. The AMA continues to collect practice information from physicians throughout their entire medical careers. Data collection techniques involve the use of primary source data (i.e., data from the original source and in its original form) collected from agencies such as licensing and medical specialty boards as well as surveying the physicians directly. Data are updated continuously. In addition to physician records, the Physician

Masterfile includes information on 125 medical schools, 7,900 graduate medical education programs, 1,600 teaching institutions, and 19,000 medical group practices.

Several products are derived directly from the Physician Masterfile. The AMA offers the online DoctorFinder for patients. It also licenses data to companies that specialize in direct mailing, marketing services, the management of complex pharmaceutical call reporting systems, data integration services, and other health-related and research activities. Data from the Physician Masterfile are also frequently used by hospitals, licensing boards, group practices, and other healthcare organizations to verify physicians' credentials. Although health services and policy researchers often use the Physician Masterfile, the AMA itself no longer conducts this type of research, having reduced its capacity to do so in the 1990s.

A significant and visible activity of the AMA is advocating for physicians on important professional and public health issues of the day. The AMA has established several units to assist in this effort: (a) the Grassroots Action Center, which helps physicians communicate with their federal legislators; (b) the Advocacy Resource Center, which advances state legislative advocacy efforts in partnership with state societies; and (c) the American Medical Political Action Committee (AMPAC), which makes campaign contributions to medicine-friendly candidates and provides political education activities.

The top items on the AMA's current policy agenda are the following: (a) placing limits on non-economic damages in medical liability cases as a key part of a broader effort to effect medical liability reform; (b) lobbying for reforming Medicare's physician payment system by replacing the current physician payment formula with a system that combines stable increases in reimbursement for physicians with less paperwork; (c) incrementally expanding coverage for the uninsured and increasing access to care through the implementation of a consumer-driven, market-based plan (toward this end, the AMA signed on with other large organizations to support the Health Coverage Coalition for the Uninsured [HCCU]); (d) improving the health of the public by promoting healthier lifestyles, working to eliminate health disparities, and improving disaster preparedness, resulting in the

establishment of a Center for Public Health Preparedness and Disaster Response; (e) improving patient safety through continued support of the National Patient Safety Foundation (NPSF) and through continued advocacy at the national level; and (f) ensuring that physicians set standards for quality care by convening the Physician Consortium for Performance Improvement, with representatives from more than 100 national specialty and state societies, which aims to establish evidence-based clinical performance measures.

Penny L. Hawlicek

See also Association of American Medical Colleges (AAMC); Health Workforce; Medical Group Practice; Physicians; Physicians, Osteopathic; Physician Workforce Issues; Primary-Care Physicians; Public Policy

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<http://www.ama-assn.org>
- American Medical Association Advocacy Resource Center: <http://www.ama-assn.org/AMA/pub/category/8659.html>
- American Medical Association Grassroots Action Center: <http://capwiz.com/AMA/home>
- American Medical Political Action Committee (AMPAC): <http://www.ampaconline.org>

AMERICAN NURSES ASSOCIATION (ANA)

The American Nurses Association (ANA) is a personal membership society supporting the professional needs of the 2.9 million registered nurses (RNs) in the United States. The ANA comprises 54 constituent member organizations and more than 150,000 members. Headquartered in Silver Spring, Maryland, the ANA is a nonprofit, non-government organization, supported primarily by membership dues, the sale of publications, and revenue from certification programs.

The ANA promotes standards of nursing practice based on scientific evidence, the rights of nurses in the workplace, development of new nursing service delivery models to respond to changing healthcare demands, and policy advocacy for its members on nursing and health related issues. The ANA's stated mission is "nurses advancing our profession to improve health for all." The overall goals of the ANA are to foster high standards of nursing practice, promote the economic and general welfare of nurses in the workplace, convey a positive image of nursing, and lobby the U.S. Congress and the Administration on health issues affecting nursing and the health of the public.

Current strategic priorities of the ANA include the following: (a) professional practice and excellence, (b) healthcare and public policy, (c) knowledge and research, (d) the unification of the profession, and (e) advocacy for workforce and workplace.

History

The ANA is more than 100 years old. It was founded in 1896 as the Nurses Alumnae Association, with 20 nurses attending the first meeting to create a professional association for nurses. However, none of these attendees were registered nurses, as there were no licensing regulations for nursing at that time. The stated goals of the new organization were "to establish and maintain a code of ethics; to elevate the standards of nursing education; to promote the usefulness and honor the financial and interests of nursing." In 1900, the organization published *The American*

Nurse, and a year later, the first state nursing organizations were formed to help regulate the practice of nursing. In 1911, the organization changed its name to the American Nurses Association. Over the decades, the number of ANA members has grown, and the organization attempts to represent the interests of all nurses in the nation.

Structure and Function

Governance

The ANA is organized into constituent member organizations and affiliated organizations. The ANA has constituent member organizations in every state, the District of Columbia, Guam, and the U.S. Virgin Islands. Federal nurses also have their own constituent member organization. These constituent members govern the association through the ANA House of Delegates, which consists of members from each constituent organization. There is also an elected board of directors, and these two entities provide the governing structure for the ANA.

A key committee in the governance structure of the ANA is the Congress on Nursing Practice and Economics (CNPE), a deliberative body of the association's members with diverse clinical and practice experiences and perspectives. The CNPE focuses on establishing nursing's approach to emerging trends within the healthcare industry by identifying issues and recommending policy alternatives to the ANA board of directors.

Affiliate Organizations

The ANA has several affiliated organizations, including (a) the American Nurses' Foundation (ANF), (b) the American Nurses Credentialing Center (ANCC), (c) the American Academy of Nursing (AAN), and (d) the American Nurses Association Political Action Committee (ANA-PAC). These affiliate organizations are separate but related arms of the ANA, which take major responsibility for key ANA functions.

The ANF, which was established in 1955, is the research, education, and philanthropic arm of the

ANA. The ANF raises funds and awards grants to support advances in nursing science, education, and practice. Since its formation, the ANF has awarded more than 950 nursing research grants, totaling more than \$3.5 million.

The AAN, which was established in 1973, is the leadership and scholarship arm of the ANA. Academy fellows are nurse leaders in practice, research, and education, who are elected by their colleagues for membership in the AAN. The AAN aims to serve the public through the generation, synthesis, and dissemination of nursing knowledge.

The ANCC, which was established in 1973, is the arm of the ANA that provides tangible recognition of professional achievement and expertise in functional and clinical areas of nursing. The American Board of Nursing Specialties and the National Commission for Certifying Agencies, both well recognized throughout the certification healthcare credentialing community, accredit most of the ANCC's examination and certification processes.

The ANCC is also responsible for the Magnet Recognition Program, which recognizes healthcare organizations that meet standards of nursing excellence. This program is based on quality indicators and standards of nursing practice as outlined in the *ANA Scope and Standards for Nurse Administrators*. Magnet designation is intended as a benchmark for measuring the quality of care that consumers can expect to receive in a healthcare facility. The popular weekly newsmagazine *U.S. News and World Report* uses the Magnet designation as one of its criteria for recognizing America's best hospitals. Of the 18 hospitals listed on the U.S. News and World Report Honor Roll for 2007, 11 were Magnet hospitals.

The American Nurses Association Political Action Committee (ANA-PAC), which was established in 1974, is the lobbying arm of the ANA. The ANA-PAC raises voluntary money from members and contributes these funds to support candidates for public office who have demonstrated their support for the legislative agenda of the ANA. The ANA-PAC is bipartisan and works with both national parties to fund candidates who support nursing and the ANA's nursing agenda.

Publications

The ANA produces several publications on nursing and health policy issues. These include *The American Nurse*, a monthly newspaper, *American Nurse Today*, a monthly journal, and *OJIN: The Online Journal of Issues in Nursing*, a peer-reviewed online journal. In addition, the ANA publishes a wide variety of books and policy documents, including the *ANA Scope and Standards of Nursing Practice* for nursing as a whole and for a variety of clinical specialties in nursing.

Position Statements

The ANA represents nurses by developing guidance for clinicians such as established definitions of the profession, educational preparation for the profession, certification and credentialing, and standards and competencies. The ANA currently publishes 21 standards in cooperation with various specialty nursing organizations. These standards are updated at least every 5 years through a process overseen by the Congress on Nursing Practice and Economics (CNPE).

The ANA also is responsible for developing and promulgating the *Code of Ethics for Nurses*, which is considered one of the most important documents of the association. In addition, the ANA forms working groups to develop position statements on issues of concern to nursing such as end-of-life care, disaster preparedness, health system reform, and quality of care.

Political Activities

The ANA advocates for federal and state legislation and regulations supporting nursing practice. Such political action addresses both workplace issues such as safety, staffing to patient ratios, wages, and working conditions, and issues related to protecting the health of the public. ANA policy priorities include supporting healthcare reform efforts, expanding the roles for nurses and advanced practice nurses in healthcare delivery, increasing federal funding for nursing education and nursing workforce development, and providing greater workplace safety for nurses. In addition, the ANA has been involved in advocating for Medicare

reform, passing patients' rights legislation, providing greater protection for whistle-blower nurses, increasing the reimbursement for healthcare services, and providing greater public access to healthcare.

Susan M. Swider

See also Health Workforce; Hospitals; Nightingale, Florence; Nurse Practitioners (NPs); Nurses

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Web Sites

- American Nurses Association (ANA):
<http://www.nursingworld.org>

AMERICAN OSTEOPATHIC ASSOCIATION (AOA)

The American Osteopathic Association (AOA) is a member association that represents more than 61,000 (as of 2008) osteopathic physicians (DOs). With headquarters in Chicago, the AOA has a mission of advancing the philosophy of osteopathic medicine by promoting excellence in education, research, and the delivery of quality, cost-effective healthcare within a distinct, unified

profession. The AOA also works to promote public health; encourages scientific research; serves as the primary certifying body for DOs; is the accrediting agency for osteopathic medical colleges; and has federal authority to accredit hospitals and other healthcare facilities.

History

Founded in 1897 by a group of 16 students from the American School of Osteopathy in Kirksville, Missouri, the AOA aimed to organize the efforts of individual physicians and osteopathic medical colleges to advance the osteopathic medical profession. On April 19, 1897, the committee created a constitution and permanently established the association. Originally the American Association for the Advancement of Osteopathy, the name changed to the American Osteopathic Association in 1901.

Leadership

The AOA's leadership includes a board of trustees comprising a president, president-elect, two past presidents, three vice presidents, 18 additional trustees, an intern-resident representative, and a student representative as well as a house of delegates comprising DOs representing osteopathic medical state and regional societies and specialty colleges, a speaker, and a vice speaker.

Board Certification

The AOA, through its official certifying body, the Bureau of Osteopathic Specialists, and its 18 member certifying boards, offers 85 board certifications in specialties, subspecialties, and areas of added qualifications. Recognition by one of the certifying boards of the AOA means a DO has completed specific specialty or subspecialty training, has passed a rigorous board examination, and has met other board-specific requirements.

The AOA specialty certifying boards, through the Bureau of Osteopathic Specialists, define the qualifications required of DOs for certification and recertification in each specialty; determine the qualifications of osteopathic physicians

as specialists for certification in each specialty; conduct examinations for certification; issue certificates, subject to the approval of the AOA Bureau of Osteopathic Specialists, to those physicians who are found qualified for certification in each specialty; recommend revocation of certificates for cause; and use every means possible to maintain a high standard of practice in each specialty within the osteopathic medical profession.

DOs can become AOA board certified in anesthesiology, ophthalmology and otolaryngology, dermatology, orthopedic surgery, emergency medicine, pathology, family practice, pediatrics, internal medicine, physical medicine and rehabilitation, neurology and psychiatry, preventive medicine, neuromusculoskeletal medicine, proctology, nuclear medicine, radiology, obstetrics and gynecology, and surgery as well as a number of subspecialty and added qualification areas of medicine such as cardiology, neurophysiology, geriatrics, and medical toxicology.

Certification requirements vary by specialty. At a minimum, candidates for AOA certification must have a valid state license to practice medicine, have completed a 1-year internship followed by completion of an approved residency training program, have passed the board examination or examinations, and be members of the AOA or the Canadian Osteopathic Association.

To maintain board certification, AOA board-certified physicians must complete a minimum of 120 hours of approved and documented AOA continuing medical education credits within a 3-year period, of which 50 hours must be in their general specialty. The American Osteopathic Board of Family Physicians is an exception, requiring 150 hours with 50 hours still in the general specialty.

Board certification is a voluntary process and is not a requirement to practice in a medical specialty. DOs who have been trained in programs accredited by the Accreditation Council for Graduate Medical Education rather than in programs approved by the AOA also have the option of certifying through the American Board of Medical Specialties (ABMS). A majority of DOs continue to be certified through the member boards of the AOA, with some of those being dually certified by both AOA and ABMS boards.

Accreditation

The AOA's Commission on Osteopathic College Accreditation (COCA) is recognized by the U.S. Department of Education as the only accrediting agency for predoctoral osteopathic medical education in the United States. Accreditation action taken by the COCA means that an osteopathic medical school (a) has appropriately identified its mission; (b) has secured the resources necessary to accomplish that mission; (c) shows evidence of accomplishing its mission; and (d) demonstrates that it is capable of accomplishing its mission in the future. Accreditation of an osteopathic medical school means that it incorporates the science of medicine, the principles and practices of osteopathic manipulative medicine, the art of caring, and the power of touch within a curriculum that recognizes the interrelationship of structure and function for diagnostic and therapeutic purposes and recognizes the importance of addressing the body as a whole in disease and health.

Accreditation signifies that an osteopathic medical school has met or exceeded the AOA standards for educational quality with respect to (a) mission, goals, and objectives; (b) governance, administration, and finance; (c) facilities, equipment, and resources; (d) faculty; student admissions, performance, and evaluation; (e) preclinical and clinical curriculum; and (f) research and scholarly activity.

In addition, the AOA approves osteopathic internship and residency training programs through its Program and Trainee Review Council (PTRC). The PTRC receives reports and recommendations from evaluation committees of osteopathic specialty practice organizations for osteopathic internship and residency program approvals, denials, and increases or decreases in size and takes final action on all recommendations. In addition, the PTRC also accepts requests for AOA approval of individual DO trainees' internships or residencies that were not originally AOA-approved programs.

Recognizing the need for a new system to structure and accredit osteopathic graduate medical education, the AOA established the Osteopathic Postdoctoral Training Institutions (OPTI) in 1995. Each OPTI is a community-based training consortium comprising at least one college of osteopathic medicine and one hospital. Other hospitals and ambulatory-care facilities may also partner within

an OPTI. Community-based healthcare facilities, such as ambulatory-care clinics, rehabilitation centers, and surgical centers, may attain the educational resources and support necessary to provide physician training with an OPTI's assistance.

The AOA also provides continuing medical education (CME). The AOA Board of Trustees establishes accreditation policy for osteopathic CME sponsors. The AOA Council on Continuing Medical Education has been given authority by the AOA Board of Trustees to monitor osteopathic CME and to grant or deny Category 1 accreditation status to osteopathic CME sponsors.

Additionally, the AOA accredits medical facilities through its Healthcare Facilities Accreditation Program (HFAP). This program has been providing medical facilities with an objective review of their services since 1945. The program is recognized nationally by the federal government, state governments, insurance carriers, and managed-care organizations.

It is one of only two voluntary accreditation programs in the United States authorized by the Centers for Medicare and Medicaid Services (CMS), formerly the Health Care Financing Administration (HCFA), to survey hospitals under Medicare. The AOA accreditation program was developed in 1943 to 1944 and implemented in 1945. Under this program, hospitals were surveyed each year. In this manner, the AOA was able to ensure that osteopathic medical students received their training through rotating internships and residencies in facilities that provided high-quality patient care.

In 1965, Medicare and Medicaid were introduced, and the AOA applied to the HCFA, now CMS, for deeming authority to survey hospitals under the Medicare Conditions of Participation.

In 1995, the AOA applied for and received deeming authority to accredit laboratories within AOA-accredited hospitals under the Clinical Laboratory Improvement Amendments of 1988.

The program also accredits ambulatory care/surgery, mental health, substance abuse, physical rehabilitation medicine facilities, critical access hospitals, and long-term acute-care hospitals. Additionally, in 2006, HFAP announced that its first disease certification program—the HFAP Primary Stroke Center—had been developed. This 2-year certification is limited to HFAP-accredited

healthcare facilities. On-site survey is required every 2 years to validate ongoing compliance with HFAP standards.

Professional Publications

The AOA also produces two monthly publications for the osteopathic medical profession. *JAOA—The Journal of the American Osteopathic Association (JAOA)* is the official scientific publication of the AOA as well as the scholarly, peer-reviewed publication of the osteopathic medical profession. It provides a forum for communicating and disseminating philosophical concepts, clinical-practice observations, and scientific information as well as defines the current status of the profession. It is directed toward the osteopathic primary-care physician with a broad range of interests and provides a clinical and scientific update for the osteopathic specialist.

JAOA publishes original investigations, current reviews with an expert critical viewpoint, and didactic discourses in a wide variety of clinical fields. For the interest and information of its readers, *JAOA* may contain medical education articles, editorials, columns, book reviews, abstracts, and special-interest articles at the editor-in-chief's discretion. These articles customarily will be of clinical-scientific interest or related to issues and trends that have a bearing on the osteopathic medical profession. Controversial articles and letters may, at the editor-in-chief's discretion, be published in *JAOA*, provided that the source or author is clearly identified. DOs can receive a half-hour of Category 2-B continuing medical education credit for each issue they read of the *JAOA* and 2 hours of Category 1-B credit each time they complete a quiz in the journal or its supplements.

The DO magazine contains news of the osteopathic medical profession and its members; articles of professional and personal interest to DOs and osteopathic medical students; legislative developments; meeting coverage; clinical updates; and an extensive listing of osteopathic continuing medical education programs. DOs can earn 1 hour of Category 1-B credit for each quiz they complete from *The Whole Patient* supplements to *The DO*, the AOA's *Women and Wellness Newsletter*, and the AOA's *Health Watch* newsletter. DOs who do

not complete the quizzes can still obtain a half-hour of Category 2-B credit for each issue and supplement of *The DO* they read.

American Osteopathic Association

See also Accreditation; Health Workforce; Physicians; Physicians, Osteopathic; Physician Workforce Issues

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Web Sites

American Osteopathic Association (AOA):
<http://www.osteopathic.org>

AMERICAN PUBLIC HEALTH ASSOCIATION (APHA)

The American Public Health Association (APHA) is the oldest, largest, and most diverse organization of public health professionals in the world. It has been working to improve the nation's public health since its inception in 1872. The association aims to protect all Americans and their communities from preventable, serious health threats and strives to ensure that community-based health promotion and disease prevention activities and preventive health services are universally accessible in the United States. The APHA represents a broad array of health professionals and others who care about their own health and the health of their communities. It builds a collective voice for public health, working to ensure access to health-care, protect funding for core public health services, and eliminate health disparities, among a

myriad other issues. The APHA's strength is rooted in the dedication and passion of its members and countless other individuals, agencies, and foundations who are concerned about improving and protecting the nation's health.

History

The APHA grew out of the growing recognition by a physician named Stephen Smith and others in the medical profession that squalid living conditions caused epidemics of infectious diseases, such as typhus fever and cholera, and their frustration with the incompetence and ignorance of local officials, such as Boss Tweed and Tammany Hall, in denying these unsanitary conditions. As the citizenry became more interested in organizing local boards of health and in establishing a national chain of communications in public health, the APHA was formed in 1872 as the vehicle to carry out these activities. Its charge was to hold annual meetings and produce publications to awaken and maintain the active and permanent interest of the people in sanitary administration, greatly facilitate the enlightenment of the public, and promote the appointment of more competent health authorities. The first meeting attracted 15 people.

Over its long history, the APHA has embraced numerous topics, shifting its primary focus from laboratory aspects of water pollution, milk sanitation, hygiene education, control of tuberculosis, and infectious diseases in the 1890s to eliminating disparities in healthcare, designing healthy communities, obesity, smoking cessation, disaster preparedness, building the public health workforce, and improving the public health infrastructure in the 2000s. In this time, it has participated in some of the most extraordinary achievements of modern times—achievements that have increased the average life expectancy from 45 to more than 75 years of age. Advances in many areas of public health and practice have dramatically lessened the incidence of disease and injury, adding 25 of those years to our lives.

Size and Structure

Today, the APHA boasts nearly 50,000 members, including its affiliates. APHA members include

nurses, physicians, environmentalists, educators, dietitians, nutritionists, scientists, laboratory workers, health information specialists, dentists, podiatrists, and students. They are supported by 24 Sections and seven Special Interest Groups on a variety of professional interests, a Student Assembly, and special membership categories, including transitional membership—a limited membership open only to current student members who have completed their degree and are transitioning into the workforce; special health workers; retired members; and consumer members.

Each day, APHA members, working in health agencies, nonprofit organizations, educational settings, and medical facilities, tackle public health challenges every bit as tenacious as those faced by their 19th-century predecessors, as longer lives, sedentary habits, and poor nutrition give rise to a new spectrum of health problems. Environmental hazards continue to threaten public health, and economic factors profoundly affect access to health insurance coverage and consequently to healthcare. And efforts by lawmakers to reduce government spending threaten the nation's long-standing commitment to public health programs and education.

Products and Activities

The APHA publishes the *American Journal of Public Health*, a monthly, peer-reviewed journal published continually since 1911, and *The Nation's Health*, the APHA's award-winning newspaper, both communicating the latest public health science and practice to members, opinion leaders, and the public.

The APHA's annual meeting brings together thousands of public health professionals, agencies, and partners to network and share the latest public health data and trends, as well as set policy on emerging public health concerns.

The Public Health Exposition is the showplace for hundreds of leading organizations in the public health market, offering the latest in software, programs, publications, educational opportunities, and more in the field of public health.

The APHA offers a large number of accredited continuing education programs for many public health disciplines, including registered nurses, certified health educators, physicians, laboratory

professionals, registered dietitians, chiropractors, and dental professionals.

The APHA is a leading publisher of books promoting sound scientific standards, action programs, and public policy to enhance health. Two of the mainstays of the publications program are *Standard Methods for the Examination of Water and Wastewater*, published continually since 1917, and now in its 21st edition; and the *Control of Communicable Diseases Manual*, published continually since 1920, and now in its 18th edition—and still the most widely recognized and used resource on infectious diseases in the world.

The APHA's government affairs staff represents its members' concerns on Capitol Hill, in regulatory agencies, and in executive offices at the federal, state, and local levels. The APHA is one of the leading public health organizations with full-time advocates in the nation's capital.

National Public Health Week each year highlights an area of public health concern and encourages nationwide participation through the sections and affiliates.

The Public Health Career Mart brings together employers and employees, offering a wide variety of public health career opportunities. Added features at the annual meeting include one-on-one career-counseling sessions with professional counselors and interview time with prospective employers.

Future Implications

In the future the APHA will continue to build a collective voice for public health, working to ensure access to healthcare, protect funding for core public health services, and eliminate health disparities, among a myriad other issues. The APHA's strength will continue to be rooted in the dedication and passion of its members and countless other individuals, agencies, and foundations who are concerned about improving and protecting the nation's health.

Ellen T. Meyer

See also Acute and Chronic Diseases; Community Health; Epidemiology; Infectious Diseases; Life Expectancy; Public Health; Public Policy; World Health Organization (WHO)

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Web Sites

- American Public Health Association (APHA):
<http://www.apha.org>

AMERICAN SOCIETY OF HEALTH ECONOMISTS (ASHE)

The American Society of Health Economists (ASHE) is a professional organization dedicated to promoting excellence in health economics research in the United States. The society's leading mission is to provide a forum for emerging ideas and empirical results of health economics research. Through a set of professional activities, it aims to advance health economics research in the nation, achieve widespread recognition for the field of health economics, and enhance individual and societal health by providing evidence and expertise for the development of public and private health policies.

The academic field of health economics has experienced very rapid growth in the past three decades. Commensurate with this growth has been a similar growth in research productivity and quality along with job opportunities in academe, government, and industry. The ASHE was formed to respond to the excess demand for an outlet for health economics and policy research as well as to

provide for interaction among those conducting the research, funding the research, and making use of the research. The society makes every attempt to be inclusive, attracting the young and old, the experienced and inexperienced, leaders in the field, and graduate students preparing to enter the field.

The main venue through which the mission of the ASHE is accomplished is its biennial conference. The inaugural conference of the society was held at the University of Wisconsin, Madison, in June 2006. More than 500 individuals attended the conference, where more than 300 research articles were presented and 100 poster sessions were held. Professor Joseph P. Newhouse, the John D. MacArthur Professor of Health Policy and Management, Harvard University, and the inaugural president of the society, presided over the conference along with Jody L. Sindelar, professor in the School of Public Health at Yale University, and the president-elect of the organization. And Michael Grossman, Distinguished Professor of Economics, City University of New York Graduate Center, and Program Director of Health Economics at the National Bureau of Economic Research, was designated to serve as president after Sindelar's term of office. At the conference, the society awarded ASHE Medals to two health economists who were 40 years of age or younger and judged by their peers to have made outstanding contributions to the field. The medals were awarded to David M. Cutler, Otto Eckstein Professor of Applied Economics at Harvard University, and to Jonathan Gruber, professor of economics at the Massachusetts Institute of Technology (MIT). The second biennial conference was held at Duke University, Durham, North Carolina, in June 2008. And the third biennial conference will be held at Cornell University, Ithaca, New York, in 2010.

All the biennial conferences have broad themes, but they are equally inclusive in topics represented in the research that is presented. The society is a domestic organization open to the presentation of research results related to domestic issues. While most members are from academic institutions, there is substantial representation from government and industry as well as other countries.

The ASHE was formed under the umbrella of the International Health Economics Association (iHEA), with the full support of Professor Tom E. Getzen of Temple University, Philadelphia,

Pennsylvania, executive director of the iHEA. The first executive director of the ASHE was Professor Richard J. Arnould of the University of Illinois at Urbana-Champaign. Memberships to ASHE were initially offered in 2005 jointly with iHEA memberships. Independent memberships were first offered in 2007. The ASHE plans to be an independent not-for-profit organization in 2010. The society is governed by a board of directors, initially formed by appointment but with elections commencing in 2007, and it operates subject to the bylaws established by the board. Currently, the ASHE has approximately 800 members.

Richard J. Arnould

See also Cost of Healthcare; Health Economics; International Health Economics Association (iHEA); Newhouse, Joseph P.

Web Sites

American Society of Health Economists (ASHE):
<http://healthconomics.us>

AMERICA'S HEALTH INSURANCE PLANS (AHIP)

America's Health Insurance Plans (AHIP) is a large national trade association representing more than 1,300 member companies that provide health, long-term care, dental, disability, and supplemental insurance coverage to more than 200 million people in the United States. AHIP's principal purpose is to represent the interests of its members on legislative and regulatory issues at the federal and state levels, and with the media, consumers, and employers. Its goal is to provide a unified voice for the nation's health insurance industry, to expand access to high-quality, cost-effective healthcare to all Americans, and to provide consumers with a wide array of health insurance plans.

Background

Located in Washington, D.C., AHIP was formed in 2003, through the merger of the Health Insurance

Association of America (HIAA) and the American Association of Health Plans (AAHP).

Its oldest predecessor, the HIAA, was formed in 1956. HIAA's mission was to be the most influential advocate for the nation's private, free-enterprise healthcare system. Throughout its history, HIAA strongly opposed legislative efforts to regulate private health insurance and the establishment of national health insurance. It successfully helped defeat the Clinton administration's national health-care reform plan of 1993. To stop the Clinton plan, HIAA established a group of organizations that oppose the plan, created an aggressive grassroots campaign against the plan, and spent millions of dollars airing a powerful television commercial criticizing the plan. The TV commercial, *Harry and Louise*, depicted a middle-class couple who were despairing over the proposed plan's complex bureaucratic nature. It decried the plan as big government at its worse and featured the phrase, "They choose, we lose."

Its second predecessor, the AAHP, was formed in 1996. AAHP's mission was to present a strong, unified voice for the nation's managed-care industry and a positive image of the industry to the general public. In the late 1990s, AAHP attempted to defend the managed-care industry, which was becoming increasingly unpopular with the general public, and it was facing increasing scrutiny by the U.S. Congress concerning the tactics it used to save money.

Organization and Structure

AHIP is governed by a board of directors. The board, which comprises 56 individuals who represent various insurance companies, works to shape and guide the association's policies, programs, and research. It receives directions and input from operating and product committees, the policy committee, and the executive committee as well as issue-focused task forces, subcommittees, and working groups. The president of AHIP, who is responsible for the operations of the organization, also reports to the board.

Products and Services

AHIP provides information and services through newsletters, a magazine, and online services. It also

offers a combination of conferences, self-study courses, and programs that assist health professionals in staying abreast of important issues in healthcare. Each year, the organization hosts a number of conferences that are open to AHIP members, state health insurance trade organizations, and other leaders in healthcare. Recent conference topics included insurance product innovation and diversification, value-based healthcare, employer wellness programs, and chronic-care models of care.

AHIP Solutions is a program to help members identify the most capable and expert partners for specific business needs. These areas of need include Medicare/Medicaid, the Health Insurance Portability and Accountability Act of 1996 (HIPAA), risk and reinsurance, eHealth and eBusiness solutions, claims processing and cost management, disaster recovery and consumer-directed healthcare. Agreements between the partners and AHIP are structured to assist in marketing partners' services to members.

AHIP Foundation

The association also has a nonprofit foundation. The AHIP Foundation has the mission of enhancing the quality of healthcare delivery in managed-care settings through effective treatment systems, evidence-based medicine, performance measurement, and quality improvement. Additionally, the foundation seeks to increase the insurance industry's ability to serve diverse populations through the training and development of minority health plan managers and through the support of programs targeted toward minority populations. To accomplish this, the foundation has three programs: the Executive Leadership Program, the Executive Leadership Program for Medical Directors, and the Minority Management Development Program.

Current Efforts

AHIP's latest endeavor is a proposal to expand access to health insurance coverage to every American. The plan would expand access to health insurance coverage to all children within 3 years of age and 95% of adults within 10 years. According to AHIP, the plan would expand eligibility for public programs, enable all consumers to

purchase health insurance with pretax dollars, provide financial assistance to help working families afford coverage, and encourage states to develop and implement access proposals. A plan of this magnitude would cost the federal government approximately \$300 billion over a 10-year period and call for some radical changes in healthcare policies. Some of the key elements of the AHIP plan include expanding the State Children's Health Insurance Program (SCHIP) to make eligible all uninsured children from families with incomes less than 200% of the Federal Poverty Level (FPL), establish a Universal Health Account that would allow individuals to purchase any type of healthcare insurance, and establish a health tax credit of up to \$500 for low-income families who secure health insurance for their children.

Gregory Vachon and Tiosha T. Goss

See also Consumer-Directed Health Plans (CDHPs); Health Insurance; Health Insurance Coverage; Medicare; National Health Insurance; State Children's Health Insurance Program (SCHIP); Uninsured Individuals

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America's Health Insurance Plans (AHIP), Insurance

Education: <http://www.insuranceeducation.org>

Employee Benefit Research Institute (EBRI):

<http://www.ebri.org>

National Conference of Insurance Legislators (NCOIL):

<http://www.ncoil.org>

ANDERSEN, RONALD M.

Born in Omaha, Nebraska, in 1939, Ronald Max Andersen received his bachelor's degree (1960) from the Santa Clara University and his master's (1962) and doctorate (1968) degrees from Purdue University. From 1974 to 1990, Ronald Andersen worked at the Center for Health Administration Studies (CHAS) in the Graduate School of Business at the University of Chicago. From 1980 to 1990, he was the director of the Program for Health Administration and CHAS. In 1991, he became the Wasserman Professor of Health Services and Sociology at the University of California, Los Angeles (UCLA). In 2004, he became Professor Emeritus.

During his academic career, Andersen has made major conceptual and methodological contributions to the study of healthcare utilization behavior and access to healthcare through the design and conduct of large-scale community, national, and cross-national health surveys. In 1968, he published a monograph introducing the behavioral model of families' use of health services, based on an analysis of a 1963 national survey of healthcare utilization and expenditures. This model, and Andersen and his colleagues' successive adaptations of it, continue to guide much of the explanatory research on healthcare utilization behavior.

Andersen's subsequent work built directly on these interests. He was principal investigator for national health surveys conducted in 1970 and 1976. The latter survey extended his earlier conceptual and empirical work on utilization to examining the issues of access to healthcare. The access

framework developed in connection with that survey served to guide the development of community-survey-based evaluations of the Community Hospital Program and Municipal Health Services Program, conducted by the CHAS, with support from the Robert Wood Johnson Foundation. Andersen was also the principal investigator for subsequent projects to conduct secondary analyses of data collected through these and related state, community, and national surveys.

Andersen also provided leadership in the study of healthcare delivery system issues in the United States through the design and implementation of the National Study of Internal Medicine Manpower, a national evaluation of home-care programs for ventilator-assisted children, studies of health services use by the homeless, and evaluation of community-based dental programs and related dental health profession needs. He extended the application of his empirical and conceptual interests in these areas to the design and conduct of cross-national comparative studies of utilization and access through the World Health Organization (WHO) International Collaborative Study of Dental Manpower Systems in Relationship to Oral Health Status.

Andersen has received numerous awards and honors. He was named the Fred and Pamela Wasserman Professor of Health Services at the UCLA School of Public Health. His contributions were acknowledged by colleagues in the fields of medical sociology and health services research through his receipt of the Leo G. Reeder Distinguished Medical Sociologist Award from the Medical Sociology Section of the American Sociological Association (1994), the Association for Health Services Research Distinguished Investigator Award (1996), and the Health Services Research Prize from the Baxter Allegiance Foundation (1999). His lifetime scholarly achievements were acknowledged by his receiving the Distinguished Alumnus Award (1998) and an honorary doctorate degree (1999) from Purdue University.

Lu Ann Aday

See also Access, Models of; Access to Healthcare; Aday, Lu Ann; Anderson, Odin W.; Health Services Research, Origins; Medical Sociology; Public Policy

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ANDERSON, ODIN W.

Odin W. Anderson (1914–2003) is a worthy candidate for "the father of medical sociology." After World War II, a few sociologists in the United States began to take interest in medical sociology (although the term had not yet been coined). In 1960, a section on the sociology of medicine was established within the American Sociological Association (ASA), and quickly it became one of the largest sections. Anderson was a member of the founding committee for this section and its second chair. In the following decades, other academic disciplines, including economics, political science, and operations research began to study health services, and philanthropic foundations

and the federal government became interested in funding research on the health services industry, destined to become the largest industry in the nation. Anderson's career spanned these periods of significant growth of the health services sector and profoundly influenced its study.

Born in Minneapolis, Minnesota, in 1914, Anderson received his bachelor's degree (1937) and master's degree in sociology (1938) from the University of Wisconsin–Madison. He then moved to the University of Michigan, where he received a bachelor's degree in library science (1940) and his doctorate degree in sociology (1948). While at Michigan, Anderson became the first sociologist to work in a school of public health, helping establish a research program in medical care and a health services research library. In 1949, he accepted an associate professor position on the Faculty of Medicine, University of Western Ontario, Canada—another first for a sociologist to join the faculty of a medical school. There, he studied the emerging areas of social epidemiology and also began to work in the utilization of physician services in a nearby medical insurance plan.

In 1952, Odin Anderson became the research director of the Health Information Foundation (HIF), located in New York. This nonprofit research agency was founded by pharmaceutical and chemical industries in 1950 to provide information and data for public policy formulation in the United States. Anderson developed and directed a unique and highly successful research program based on national surveys of the medical-care use and expenditures of the nation's population and cross-national comparisons of the operation of health services delivery systems and health insurance.

The HIF moved to the University of Chicago in 1962, where it was renamed the Center for Health Administration Studies. Anderson continued to serve as the research director and became a professor in the Graduate School of Business and the Department of Sociology. CHAS flourished under Anderson's direction, expanding its national and international health services research program with support from foundations and the federal government. The center served as a national model and reference point for health services research.

In 1980, on reaching the mandatory retirement age of 65 at the University of Chicago, Anderson returned to the University of Wisconsin–Madison

with a half-time professorship in the Department of Sociology. He also continued to teach and to conduct research for another 10 years at CHAS as Professor Emeritus. In this last period of his career, he continued to be incredibly productive, conducting a study of Health Maintenance Organizations (HMOs) in Minneapolis–St. Paul and Chicago, writing a book on health services in several countries, and writing a history of the development of American health services since 1875.

Anderson was a prolific writer, and many of his publications are considered classics in the field. His legacy of publications and lessons for the fields of medical sociology and health services research has been validated by numerous recognitions. The Section on Medical Sociology of the American Sociological Association cited him as a Distinguished Medical Sociologist (1980), and the Association for Health Services Research cited him as a Distinguished Health Services Researcher (1985). He was awarded the Baxter Alliance Distinguished Health Services Researcher Prize (1999). And he received honorary doctoral degrees from the Faculty of Medicine, University of Uppsala, Sweden (1977), and the College of Osteopathic Medicine, Chicago (1979).

His enduring research contributions for the fields of medical sociology and health services research include a conceptual systems approach for understanding the health services enterprise; empirical data systems for actuaries, economists, and policy-makers about the financial problems of healthcare consumers; fundamental approaches to cross-national comparisons and the understanding of generic health services systems problems; and understanding the social, political, and economic environments in which American health services developed. He was a trusted advisor to more than 500 consultants and administrators in hospitals and medical-care plans across the nation and in numerous foreign countries. And he mentored many graduate students who subsequently worked in more than 30 universities in the nation and abroad and numerous others who work in government and nongovernment agencies. Anderson's influence on these students has been enormous, and his conceptual thinking and approach to medical sociology and health services research continue through their efforts.

Ronald M. Andersen

See also Aday, Lu Ann; Andersen, Ronald M.; Comparing Health Systems; Health Services Research, Origins; International Health Systems; Medical Sociology

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ANTITRUST LAW

Antitrust law seeks to maintain an environment of free and fair competition in markets for goods and

services. Its implementation is based on the assumption that abusive business practices that corrupt the free market can create inefficiencies and excessive costs for consumers. To this end, antitrust law addresses two kinds of potential abuses, one involving collusion among separate firms that compete with one another and the other involving willful efforts by a single firm to monopolize a market.

Antitrust law affects many kinds of healthcare business arrangements, including the relationships between providers and insurance companies, the functioning of professional societies, the composition of hospital medical staffs, and the growth of health systems. Its influence shapes key aspects of the healthcare industry that are based on these arrangements, such as the size of provider networks, the structure of business collaborations, the nature of price negotiations between providers and health maintenance organizations (HMOs), and the disciplinary process for clinicians who violate hospital quality standards. Health services researchers study antitrust law to understand better the economic dynamics of healthcare. The results of these investigations and analyses provide fuel for ongoing debates about the appropriate roles of government and of private markets in allocating healthcare goods and services.

Legal Framework

Three federal statutes are central to antitrust law in the United States. The most important of these is the Sherman Act, which was enacted in 1890. Section 1 of that law (codified as 15 U.S.C. §1) prohibits any “contract, combination . . . or conspiracy in restraint of trade.” Such arrangements have been interpreted by the courts to include various forms of collusion among competitors, including price fixing, group boycotts, market allocation agreements, exclusive dealing, and tying arrangements. Section 2 (codified as 15 U.S.C. §2) prohibits monopolization, attempted monopolization, and conspiracies to monopolize. Growth in the size of a company due to business success alone is not sufficient to violate this provision. Rather, monopoly power must be achieved or maintained through willful anticompetitive conduct, such as the use of threats, intimidation, coercion, or boycotts. However, monopolization of a market does not

require the elimination of all competition. It is sufficient that a single firm achieves sufficient market power to be able to raise prices unilaterally without suffering competitive harm.

The interplay of these two provisions of the Sherman Act can be especially problematic for healthcare providers. Collaboration with competitors, as may take place between physician practices or between hospitals in negotiations with HMOs, can violate Section 1. However, merging with or acquiring a competitor to form a single larger entity to gain bargaining leverage can create liability under Section 2 if it creates too great a market share. The result of this legal dynamic can significantly limit the strategic options available to providers.

Violations of the Sherman Act can trigger three levels of enforcement. The most serious abuses may subject the violator to criminal penalties. Less severe infractions may result in government-imposed fines. Private parties may also sue antitrust violators for damages based on any economic harm that they have sustained. This is a particularly potent enforcement threat because a violation may affect many businesses and consumers who can become plaintiffs, and if they succeed in court, they are entitled to recover treble damages, which is an amount representing three times their actual financial loss.

The second statute is the Clayton Act, Section 7 of which (codified as 15 U.S.C. §18) prohibits mergers and acquisitions that may substantially lessen competition or tend to create a monopoly. This law does not punish violators but rather permits regulators to force them to unwind suspect transactions. For example, a hospital that gains too large a market share by acquiring competitors may be ordered to divest some of them. Courts will generally consider factors such as the market share, market concentration, and market power of the acquiring company in deciding whether a transaction has violated this law.

The final statute is the Federal Trade Commission (FTC) Act, Section 5 of which (codified as 15 U.S.C. §45) prohibits unfair and deceptive trade practices. Courts have interpreted such practices to include antitrust violations. This statute does not extend the range of activities subject to antitrust enforcement, but rather grants enforcement authority concerning violations of other laws, including the Sherman and Clayton acts, to the FTC.

Antitrust Principles and Healthcare Markets

Observers have noted a mismatch between the conceptual foundations of antitrust law and the functioning of healthcare markets. In healthcare, three underlying assumptions about traditional market structure are missing. These are the assumptions that buyers can make informed decisions, that they respond to changes in price, and that they are aware of the full costs of their purchases. Patients, as consumers, lack the information and expertise to evaluate purchasing decisions. They must rely for advice on their physicians, who are the sellers of services, a situation that economists call *asymmetry of information*. Price fluctuations are unlikely to affect patients' purchasing decisions because the goods and services involved are essential to maintaining life and health, a situation that economists call *price inelasticity of demand*. Finally, and perhaps most significantly, neither patients nor their physicians are exposed to the full financial consequences of purchasing decisions because of the role of insurance in covering the costs, a situation known as *moral hazard*. As a result of this mismatch, the role of antitrust law in attempting to protect consumers by maintaining a traditional economic market in healthcare has been controversial.

The function of third-party insurance coverage for healthcare costs has posed particular challenges for antitrust enforcement. The Sherman Act was passed to help buyers who were exploited by collusive or monopolistic practices of sellers, and courts have tended over the years to interpret it to favor buyers over sellers. It was enacted in an era when many major American industries were controlled by single companies or by trusts composed of a few of them. In healthcare, however, the buyer of services is usually an insurance company that pays the bills, even though the actual consumer is an individual patient, and the seller is often a physician practicing alone or in a small group. As a result, the act has at times had the effect in healthcare of protecting large corporate entities against the actions of individuals. For example, some courts have characterized group negotiation by physicians with HMOs as a form of price fixing. Some physicians have argued that the U.S. Congress should grant an exception to the antitrust laws for such joint bargaining similar to the one that applies to labor unions.

Antitrust law has also presented a challenge for hospitals and professional societies that discipline physicians for infractions of quality standards. For example, hospital credentials committees, which decide who will be permitted to practice within the institution, are composed of experienced physicians who often maintain practices of their own. Therefore, they may be economic competitors of those whose competence they must judge. In a number of instances, physicians who have lost hospital privileges have sued the institution involved, alleging that its actual motives were to stifle competition rather than to maintain quality. Courts have generally ruled against the physicians in these cases, and the U.S. Congress has further protected hospitals that engage in good faith peer review of hospital staff members from antitrust liability through a law known as the Health Care Quality Improvement Act of 1986. Nevertheless, the threat of litigation persists as healthcare, unlike most other industries, must continue to rely on the expertise of market competitors to enforce quality standards.

Regulatory Agencies

Two federal agencies have primary responsibility for enforcing the antitrust laws. These are the U.S. Department of Justice (DOJ), through its antitrust division, and the FTC. Either agency can bring a legal action against a violator for civil penalties, including fines or an injunction, although the FTC is limited in its authority to act against nonprofit organizations, such as nonprofit hospitals. Only the DOJ can act when criminal penalties are sought. In addition to federal enforcement, states attorneys general can proceed against violators under antitrust laws that have been enacted in most states.

Enforcement agencies have considerable discretion in selecting the targets of their activities. This latitude can play an especially important role in the implementation of antitrust law in healthcare because of the conceptual ambiguities in applying legal principles that assume a traditional market structure to healthcare markets. To reduce uncertainty and to guide private decision making, the DOJ and the FTC have jointly issued regulations that offer prospective guidance on healthcare business practices that

they will consider to be legitimate under the Sherman Act and therefore exempt from prosecution. These are called Safety Zones, and they devote particular attention to the integration of physician practices. Under these rules, factors such as market share, exclusivity rules for network members, and the extent of financial risk sharing among members determine when physicians may form networks without fear of antitrust enforcement.

Future Implications

Antitrust law seeks to improve the healthcare system by controlling certain kinds of abusive business practices that can inflate costs. These practices include collusion between competing firms and growth in the market share of single firms that is sufficient to create monopoly power. However, the structure of healthcare creates challenges for antitrust enforcement because the purchase and sale of healthcare goods and services do not fit the characteristics of traditional markets. This is the result of several factors, most notably the role of insurance in buffering patients from the full costs of the goods and services they consume.

Long-standing judicial interpretations of the antitrust laws that generally favor buyers over sellers have also created anomalies in enforcement policy. In traditional markets, buyers tend to be individual consumers, and sellers to be large corporate entities; however, in healthcare, the buyer is often not the actual patient but rather an insurance company, while the seller may be an individual physician. The key antitrust regulatory agencies, the DOJ and the FTC, have tried to address this incongruity with regulations that set forth special enforcement policies regarding antitrust in healthcare. Nevertheless, antitrust policy continues to raise larger questions concerning the effectiveness of applying market concepts to an industry whose functioning does not fit many traditional economic assumptions.

Robert I. Field

See also Competition in Healthcare; Healthcare Markets; Health Economics; Hospitals; Managed Care; Public Policy; Regulation; U.S. Government Accountability Office (GAO)

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- Federal Trade Commission (FTC): <http://www.ftc.gov/bc/healthindex.shtml>
- National Bureau of Economic Research (NBER): <http://www.nber.org>
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U.S. Department of Justice (DOJ), Antitrust Division:
<http://www.usdoj.gov/atr>
 U.S. Government Accountability Office (GAO):
<http://www.gao.gov>

ARROW, KENNETH J.

Kenneth J. Arrow was one of the most prominent economic theorists of the 20th century. Arrow's classic 1963 article "Uncertainty and the Welfare Economics of Medical Care" launched the field of health economics. His landmark article addressed the role of market competition in delivering healthcare services, the implications of moral hazard (the notion that health insurance increases demand for healthcare services), the uncertainty inherent in healthcare, the role of nonmarket social institutions, the existence of extreme information asymmetry (the inequalities of information between insurer, physician, and patient), and the importance of trust in the physician-patient relationship, given the existence of information asymmetry.

Arrow is currently the Joan Kenney Professor of Economics and Professor of Operations Research, Emeritus, at Stanford University, and senior fellow at the Center for Health Policy at the Freeman Spogli Institute for International Studies, the Center for Outcomes Research, and the Institute for Economic Policy Research, all at Stanford. In 1972, Arrow won the Nobel Prize in Economics for his work on general equilibrium theory and welfare theory. In 2004, he also was awarded the National Medal of Science, the nation's highest scientific honor, for his contributions to understanding decision making under imperfect information and bearing risk.

Arrow was born in 1921 in New York City. He earned a bachelor's degree in social science from the City College of New York (1940) and a master's degree in mathematics (1941) and a doctorate degree in economics (1951) from Columbia University. During World War II, he served as a weather officer in the U.S. Army Air Corps, rising to the rank of captain. From 1946 through 1949, he was a graduate student at Columbia University and a research associate at the Cowles Commission for Research in Economics at the University of

Chicago. In 1949, he began teaching economics and statistics at Stanford University, where he eventually achieved the rank of professor. In 1968, Arrow left Stanford to become a professor of economics at Harvard University. He remained at Harvard until 1979. That year, he returned to Stanford University and remained there until 1991, when he retired and became professor emeritus.

Arrow is the recipient of numerous awards and honors. He received the John Bates Clark Medal of the American Economic Association. He is an elected member of the National Academy of Sciences and the American Philosophical Society. Arrow was also a fellow of the American Academy of Arts and Sciences, the Economic Society, the Institute of Mathematical Statistics, and the American Statistical Association. He was the president of the Econometric Society, the Institute of Management Sciences, and the American Economic Association. He holds honorary degrees from the University of Chicago, the City University of New York, and the University of Vienna.

Arrow's broad research interests include the economics of information and organization, collective decision making, general equilibrium theory, and environment and growth. His major contribution in the field of economics was his work in social choice theory, particularly his impossibility theorem. Arrow also pioneered research in endogenous growth and information economics, which explained the source of technical change and why firms innovate. And his research on information economics investigated the problems caused by asymmetric information in various markets.

Ross M. Mullner

See also Adverse Selection; Cost of Healthcare; Health Economics; Health Insurance; Market Failure; Moral Hazard; Public Policy

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Nobel Prize Autobiography: http://nobelprize.org/nobel_prizes/economics/laureates/1972/arrow-autobio.html

Stanford University Economics Department Faculty Profile: <http://www-econ.stanford.edu/faculty/arrow.html>

ASSOCIATION FOR THE ACCREDITATION OF HUMAN RESEARCH PROTECTION PROGRAMS (AAHRPP)

The Association for the Accreditation of Human Research Protection Programs (AAHRPP) is a nonprofit association, based in Washington, D.C., that works with organizations that conduct human research to raise the level of protection for research participants. The association accredits organizations that can demonstrate that they provide participant safeguards that surpass the threshold of federal requirements. Its accreditation program uses a voluntary, peer-driven, educational model that includes site visits and a set of performance standards and outcome measures.

History

The AAHRPP was founded in 2001 by seven nonprofit organizations with an interest in human research protection. The founding members were the Association of American Medical Colleges (AAMC), Association of American Universities (AAU), Consortium of Social Science Associations (COSSA), Federation of American Societies for

Experimental Biology (FASEB), National Association of State Universities and Land-Grant Colleges (NASULGC), National Health Council (NHC), and the Public Responsibility in Medicine and Research (PRIM&R).

In 2005, AAHRPP was awarded a federal 5-year contract by the U.S. Department of Veteran Affairs (VA) for the accreditation of all the VA's Human Research Protection Programs. During the course of the contract, AAHRPP will administer its accreditation program to all 120 VA facilities. In 2006, AAHRPP accredited its first international medical center, the Samsung Medical Center, in Seoul, Republic of Korea. In 2007, AAHRPP accredited a total of 47 organizations, which included both major universities and VA facilities.

Mission

Responding to increased public concern for protecting human research participants, AAHRPP seeks not only to ensure compliance with existing regulations but also to raise the bar in human research protection by helping organizations reach performance standards that surpass the threshold of federal requirements. Accreditation by AAHRPP signifies that an organization is committed to the most comprehensive protections for research participants and the highest quality research. AAHRPP works to protect the rights and welfare of research participants and promote scientifically meritorious and ethically sound research by fostering and advancing the professional and ethical conduct of persons and organizations that engage in research with human participants.

Eligibility for Accreditation

AAHRPP accredits any eligible organization that seeks accreditation. Most organizations that conduct human research are also involved in other activities that are not directly related to their research activities: Universities are involved in teaching and service, hospitals are involved in patient care and community outreach, and companies are involved in marketing and distribution activities. AAHRPP only accredits an organization's human research protection program.

Accreditation Process

AAHRPP's accreditation process uses a set of objective standards to evaluate the quality and level of protection that an organization provides research participants. The accreditation process consists of four steps: (1) application preparation—the organization conducts a self-assessment to evaluate its program and makes improvements; (2) on-site evaluation—a team of experts review materials and performs an on-site evaluation visit; (3) council review—the AAHRPP's council on accreditation reviews the report, deliberates on the team's findings, and determines accreditation status; and (4) notification of accreditation status—the organization receives a report detailing its accreditation status.

Standards and Principles

The goal of AAHRPP's accreditation is to improve the systems that protect the rights and welfare of individuals who participate in research. In addition, accreditation can help communicate to the public the strength of an organization's commitment to the protection of human research participants. It will also improve the overall quality of research by consistently applying high standards and practices, raising the global benchmark for human research protection.

To help promote all these goals, AAHRPP has adopted nine principles for accreditation of human research protection program. These nine principles serve as the foundations for the content of the AAHRPP accreditation standards. The standards themselves are designed to help organizations consistently meet ethical principles and standards for protecting research participants, yet be flexible enough to account for the diverse institutional and cultural contexts in which research is conducted and reviewed. The nine principles are as follows: (1) protecting the rights and welfare of research participants must be an organization's first priority; (2) protecting research participants is the responsibility of everyone within an organization and is not limited to the institutional review board (IRB); (3) striving to exceed the federal requirements and continually seeking new safeguards for protecting research participants while advancing scientific progress must be integrated into an organization's

mission; (4) the standards for protecting participants in human research will be clear, specific, and applicable to research across the full range of settings (e.g., university-based biomedical, behavioral, and social science research, independent review boards, hospitals, government agencies, and others); (5) the standards will identify outcome measures that organizations can use to assess and demonstrate quality improvement over time; (6) the standards will be performance-based, using objective criteria and measurable outcomes to evaluate whether a human research protection program effectively implements the standards; (7) the accreditation process will provide a clear, understandable pathway to accreditation, along with equally clear pathways for appeal and the remediation of identified shortcomings; (8) the accreditation process will be educational, involving collegial discussion and constructive feedback; and (9) the accreditation process will be responsive to changes in federal regulations and to standards that will evolve based on what AAHRPP learns from accrediting organizations from research settings.

Domains and Standards

AAHRPP's approach to voluntary accreditation incorporates five domains of a highly developed human research protection program. The domains refer to different areas of responsibility that must be addressed. Meeting the requirements for all five domains is the responsibility of the organization seeking accreditation. Altogether, there are 20 AAHRPP standards within the five domains. Each standard is followed by one or more elements. The five domains are the following: (1) the organization—the entity that assumes responsibility for the human research protection program and applies for accreditation (i.e., an academic institution, clinic, hospital, managed-care organization, contract research organization, or corporate entity, such as a pharmaceutical or biotechnology company, or independent review board); (2) research review unit—the arrangements that the organization has made for an independent review of ethical and scientific aspects of each research protocol involving human participants (such activities are generally carried out by an IRB); (3) investigator—the

various arrangements that the organization has made for ensuring that individuals who plan to conduct research, whether as a principal investigator, coinvestigator, or other member of a research team, understand and fulfill their responsibilities; (4) sponsored research—the organization’s arrangement for structuring its relationships with those who fund or initiate research external to the organization, such as federal agencies, foundations, individual donors, and corporations (e.g., pharmaceutical or biotechnology companies); and (5) participant outreach—the arrangements the organization has made for understanding the social, psychological, and physical needs and concerns of research participants and their communities.

Daniel J. O’Brien

See also Academic Medical Centers; Association of American Medical Colleges (AAMC); Ethics; Hospitals; Informed Consent; Randomized Controlled Trials (RCTs); U.S. Department of Veterans Affairs (VA); U.S. Food and Drug Administration (FDA)

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<http://www.aahrpp.org>

Clinical Trials: <http://clinicaltrials.gov>

IRB Forum: <http://www.irbforum.org>

ASSOCIATION OF AMERICAN MEDICAL COLLEGES (AAMC)

The Association of American Medical Colleges (AAMC) is a nonprofit organization that seeks to improve the nation’s health by enhancing the effectiveness of academic medicine in three mission areas: (1) medical education, (2) medical research, and (3) patient care. In the pursuit of its mission, the AAMC serves the organizations that constitute the medical education system—medical schools, teaching hospitals, and academic and professional societies—and the individuals in this system—medical school faculty, medical students, and medical residents.

History

The AAMC was initially formed in 1876 as the Provisional Association of Medical Colleges, and its broad mission was to “consider all matters relating to reform in medical college work.” That it was formed in the late 1800s is a reflection of the tremendous changes occurring at this time in higher education in general and medical education in particular. The nation’s leading medical schools were advocating and implementing higher standards in medical education such as a longer academic year, more years of training, more stringent entry and graduation requirements, and more intensive training in the biological sciences.

As the nation’s medical education system has evolved, so too has the AAMC. At its inception in 1876, the Provisional Association of Medical Colleges represented only 22 of the nation’s medical schools. Today, the AAMC represents not only 125 U.S. and 17 Canadian medical schools but also 400 teaching hospitals (including 98 related health systems and 68 U.S. Department of Veterans Affairs’ [VA] medical centers), 94 professional societies to which approximately 109,000 medical faculty belong, and 171,000 medical students and residents.

Size and Structure

The AAMC is located in Washington, D.C., and employs nearly 400 individuals. Its mission and service role are clearly reflected in its organization.

About half of the AAMC's staff is concentrated in five offices that support and service the organization's specific program areas, the public, and its members. The other half of the AAMC's staff is concentrated in six divisions that reflect its mission or program areas. These divisions focus on diversity policy and programs, healthcare affairs, biomedical and health science research, medical education, medical school affairs, and medical school services and studies. The medical education division leads the AAMC's efforts to improve the quality, content, and conduct of medical education programs. The medical school affairs division offers faculty and administrators professional development programs and services and supports medical schools in the areas of admissions, academic progress and promotion, and financial aid. The medical school services and studies division manages the AAMC's medical school admission and application services and supports the residency match process.

The AAMC also maintains three specialized units. Two units have recently been established to highlight high-priority mission areas and stimulate development and support of innovations in these areas. One unit focuses on innovations with respect to improving clinical care, while the other focuses on innovations for improving medical education. The third unit is the Center for Workforce Studies, which develops data resources and collaborates on the research necessary to understand and inform decision making related to physician workforce issues.

Member groups or councils represent the various groups served by the AAMC within its organizational structure. Each group meets regularly and works with the AAMC to identify issues, develop policies, and plan programs within its own area of expertise and interest. Three of these member groups are governing councils: (1) the Council of Deans, (2) the Council of Teaching Hospitals and Health Systems, and (3) the Council of Academic Societies. These three councils, along with the Organization of Student Representatives and the Organization of Resident Representatives, elect

representatives to the Executive Council, which is the AAMC's 30-member governing body.

Products and Activities

The AAMC administers and/or supports a wide range of programs and activities related to its mission areas of medical education, medical research, and patient care. For example, the AAMC offers professional development programs, advocates for legislation critical to its mission, sponsors a loan program for medical students and residents, and publishes more than 100 books, statistical reports, documents, and periodicals. A common thread that runs through all the efforts of AAMCs is an emphasis on research, data collection, analysis, and reporting.

Since a major focus of the AAMC is facilitating and monitoring the medical education process, many of its products involve some aspect of the process. The AAMC helps staff the Liaison Committee on Medical Education (LCME), which accredits medical schools leading to the MD degree, and publishes descriptions and the admission requirements of each medical school in the book *Medical School Admission Requirements*. The AAMC administers the test required for admission to medical school called the Medical College Admission Test, or MCAT®. First-year applications to medical school are funneled through a centralized application service called the American Medical College Application Service or AMCAS® that the AAMC helps administer. As medical students graduate, the AAMC administers the Medical School Graduation Questionnaire, which asks students about their medical school experiences; the data are compiled and made available to medical schools, researchers, and others. The AAMC provides services to the National Residency Matching Program (NRMP), the organization that matches medical school graduates to residency programs. The AAMC manages the Electronic Residency Application Service, or ERAS®, that transmits documents such as applications and letters of recommendation to residency and fellowship programs. In cooperation with the American Medical Association (AMA), the AAMC conducts the National Graduate Medical Education Census, which obtains information on residency program characteristics and rosters of residents.

Future Implications

At its inception more than 130 years ago as the Provisional Association of Medical Colleges, the AAMC focused simply on medical education. Today, the AAMC has broadened its focus to address complex political, social, and economic issues that affect the ability of physicians to provide quality medical care. Specifically, the AAMC has identified seven issues that have already spurred the development of several initiatives and will guide its future programming. The issues are (a) improving racial and ethnic diversity within the nation's medical schools, and ultimately within the physician workforce; (b) addressing and solving the issue of Americans without health insurance, a burden shouldered disproportionately by academic medical centers; (c) maximizing medicine's readiness to respond to large-scale disasters that threaten the health of the public through developing and incorporating new curricula within the nation's medical schools; (d) ensuring patient-centered, quality healthcare; (e) securing sufficient numbers and the right types of physicians to meet the nation's future healthcare needs; (f) mitigating the impact of medical student debt on practice choices; and (g) assisting those medical schools, medical centers, and students affected by Hurricane Katrina.

Penny L. Havlicek

See also Academic Medical Centers; American Medical Association (AMA); Flexner, Abraham; Health Workforce; Hospitals; Physicians; Physician Workforce Issues; Public Policy

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Web Sites

- Association of American Medical Colleges (AAMC):
<http://www.aamc.org>
- Liaison Committee on Medical Education (LCME):
<http://www.lcme.org>
- National Resident Matching Program (NRMP):
<http://www.nrmp.org>

ASSOCIATION OF UNIVERSITY PROGRAMS IN HEALTH ADMINISTRATION (AUPHA)

The Association of University Programs in Health Administration (AUPHA) is a global network of colleges, universities, faculty, individuals, and organizations dedicated to improving health outcomes by promoting excellence in healthcare management education. AUPHA fosters excellence and innovation in healthcare management education, research, and practice by providing opportunities for member programs to learn from each other, by influencing practice, and by promoting the value of healthcare management education. It is the only nonprofit entity of its kind that works to improve the delivery of health services—and thus the health of citizens—throughout the world by educating professional managers at the entry level.

AUPHA's membership includes baccalaureate and master's degree programs in health administration education in the United States and Canada. Its faculty and individual members represent more than 500 colleges and universities. In addition, a

large number of healthcare institutions, hospitals, and other health services delivery organizations and associations worldwide participate in, and benefit from, the network and services of the association.

History

AUPHA grew out of the efforts of the W. K. Kellogg Foundation to professionalize the management of hospitals following World War II. As the war wound down, the foundation identified the improvement of the hospitals in the United States and Canada as a priority for programming because the hospital sector had been neglected during the war years. The decision was influenced by the presence on the staff of Andrew Pattullo, who had come to the Kellogg Foundation from the University of Chicago program in hospital administration, and by the fact that Mr. Kellogg had been the administrator of the Battle Creek Sanitarium, an Adventist institution headed by his brother.

The founding programs in AUPHA were the University of Chicago, Northwestern University, Columbia University, University of Minnesota, University of Toronto, Washington University, and Yale University. In 1950, AUPHA was incorporated in Illinois as a not-for-profit organization.

The Kellogg Foundation was the moving force behind the development of the field from an advisory committee headed by Charles E. Prall in the late 1940s through the founding of AUPHA. Andrew Pattullo participated in all the early developments, including funding most of the programs. And some small grants to the association supported projects during the years 1949 to 1963.

From the outset, AUPHA set standards for admission to the association. The first set of standards included the requirement that programs granting master's degrees require students to have at least one academic year of courses (of which a third must be directly concerned with hospital administration) and a year of residency or equivalent experience, have two professionally qualified faculty members, and have a degree of autonomy in operations. These standards were modified many times over the years before the establishment of the quasi-independent Accrediting Commission on Graduate Education for Hospital Administration in 1966.

Over the years, healthcare administration education has changed, and AUPHA has changed along with it. From an original membership of seven graduate programs in the United States and Canada, it has grown to more than 160 graduate and undergraduate programs in North America and hundreds of personal, corporate, and affiliated program members all over the world. AUPHA is now an international consortium of graduate and undergraduate health administration programs and practitioners engaged in the development of health management education.

Yet many of the founding principles of the AUPHA remain the same. The association continues to provide forums for discussion where leaders from the field can gather to share information on educational methods and research. And it continues to serve as an effective advocate for the health administration education community before various legislative and executive bodies. Most important, AUPHA continues to focus on providing its members with the tools, research, venues, support, and forums that enable each program, as well as healthcare administration education as a whole, to evolve and thrive in a constantly changing industry.

Vision

AUPHA's vision is to improve health outcomes by promoting excellence and innovation in healthcare management education.

Mission

AUPHA fosters excellence and innovation in healthcare management education, research, and practice by providing opportunities for member programs to learn from each other, by influencing practice, and by promoting the value of healthcare management education.

Values

AUPHA supports five values:

1. *Excellence*: The Association believes that excellence in education (scholarship, teaching, and research) leads to excellence in healthcare practice and ultimately leads to improved healthcare outcomes.

2. *Innovation*: The Association promotes innovation, encourages the adoption of new strategies, and disseminates best practices in healthcare management education.
3. *Collaboration*: The Association collaborates in the generation and translation of research and the integration of theory and practice in interprofessional work environments.
4. *Diversity*: The Association believes that diversity—in people, in programs, and in perspectives—is essential for an effective interprofessional workforce.
5. *Learning*: The Association pursues continual learning to advance and share knowledge, to foster the development of pedagogy, and to improve teaching and practice.

Programs and Services

The Faculty Forums

The faculty forums foster communication and support collaborative activities that are of special importance to their members, as well as to the field of practice. Only current members can participate in these unique and active groups.

Web Site Resources

Program member faculty have access to a variety of curricular materials geared toward the topics of the faculty. The materials include case studies, class outlines, simulation programs, and class exercises and tests/assessments.

Prizes, Awards, Scholarships, and Fellowships

AUPHA provides and administers several prizes, awards, scholarships, and fellowships each year for faculty and students from member programs, such as the William B. Graham Prize for Health Services Research, the Triad Hospitals Corris Boyd Scholars Program, the Bugbee-Falk Book Award, the David A. Winston Health Policy Fellowship, the John D. Thompson Prize for Young

Investigators, and the Filerman Prize for Innovation in Health Services Management Education.

Publications

AUPHA publishes every 2 years the *Healthcare Management Education Directory of Programs*. This publication is a comprehensive listing of all AUPHA member healthcare management programs. It features information on baccalaureate, master's, doctoral, executive, and distance education programs, including admissions procedures and costs including tuition, room and board, fees, and books.

The AUPHA publishes quarterly the *Journal of Health Administration Education*. This peer-reviewed journal contains scholarly articles on various research topics, case studies, and essays by leading healthcare management and administration educators and professions.

The association also publishes the *AUPHA Exchange*, an electronic quarterly newsletter on various issues in healthcare management education, with a brief monthly supplement containing news from program members and a list of current employment opportunities.

Program Support

AUPHA staff and faculty provide program consultation regarding the membership process and the undergraduate certification process. Specialized consultation is also available on request. The Commission on Accreditation of Healthcare Management Education (CAHME) offers accreditation to qualified graduate academic programs.

Surveys and Data Collection

Members of AUPHA have access to various survey reports and data gathered by the association, such as the Annual Survey of Health Administration Programs, the Faculty Salary Survey, current Trend Data for Health Administration Education, and meeting presentations.

Lydia M. Reed

See also Academic Medical Centers; American College of Healthcare Executives (ACHE); Health Workforce; Hospitals; Kellogg Foundation

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- Association of University Programs in Health Administration (AUPHA): <http://www.aupha.org>
- American College of Health Care Administrators (ACHCA): <http://www.achca.org>
- American College of Healthcare Executives (ACHE): <http://www.ache.org>
- American College of Physician Executives (ACPE): <http://www.acpe.org>
- American Organization of Nurse Executives (AONE): <http://www.aone.org>
- Canadian College of Health Services Executives (CCHSE): <http://www.cchse.org>
- Medical Group Management Association (MGMA): <http://www.mgma.com>
- National Association of Health Services Executives (NAHSE): <http://www.nahse.org>
- U.S. Department of Labor (BLS): <http://www.bls.gov>

B

BENCHMARKING

Benchmarking in healthcare is an active process of continuously evaluating critical processes and/or clinical outcomes and comparing those results with similar organizations or populations. Benchmarking is a measure of best-practices performance. Based on benchmarking results, best practices can be identified and adopted, thus achieving superior performance. Benchmarking is useful in healthcare for both operational and clinical processes. This is particularly true in the clinical-practice environment, where providers are increasingly being held accountable by regulators and accreditation organizations for outcomes. Payers are also holding providers accountable for outcomes as part of pay-for-performance initiatives and value-based purchasing decisions.

Background

Benchmarking originated in industries outside of healthcare to improve product quality, service, delivery, and practices. Benchmarking has its historical roots in *kaizen*, or the Japanese philosophy of continuous improvement and competitive advantage. This technique can enable industries to achieve superior performance and practices by investigating and comparing their practices and outcomes with those of similar organizations. Benchmarking provides the opportunity to identify best practices for an industry and promotes

the adoption of universal standards that the organization and industry strive toward. A central part of benchmarking are the performance measures that establish the benchmark and the benchmark partners, which can be allies or competitor organizations against which comparisons are made. The core components of the benchmarking process include understanding one's own organizational performance, analyzing the performance and outcomes of competitors or sister organizations with superior performance, and implementing the practices that improve performance and outcomes. Benchmarking can instruct an organization about what can be achieved and how superior results can be attained.

Benchmarking can be useful for healthcare organizations to determine their core competencies and how they compare against their competitors. It can also be used to identify top performers relative to selected outcomes or care processes, determine where an organization is in relationship to those outcomes, and position it to understand how to improve its own care processes through identification and implementation of best practices to achieve better outcomes. Through the use of benchmarking, healthcare organizations can also gain a better understanding of their business performance, including its strengths and weaknesses. This process allows an organization to develop strategies that facilitate better management and performance improvement on a continual basis. Benchmarking can be used as a management tool to overcome paradigm blindness, or thinking that the way processes are currently done is the best.

Additionally, it can also lead to improved organizational effectiveness.

The concept of benchmarking has grown in healthcare since costs have been escalating and payers have been demanding that healthcare organizations deliver the highest quality of care for their money. In addition, the widespread use of performance measures by accrediting bodies such as the Joint Commission, the National Committee for Quality Assurance (NCQA), and governmental agencies including the Centers for Medicare and Medicaid Services (CMS) to monitor healthcare organization performance has allowed benchmarking to become more prevalent by allowing individual organizations to compare their performance and outcomes with similar organizations. This permits an organization to develop innovative strategies and techniques that will enable it to improve its performance. Benchmarking has become essential for healthcare organizations to survive in a competitive marketplace where performance and outcomes are measured. Thus, benchmarking allows organizations to learn from their competitors or sister organizations how to address similar issues that they are confronting.

Types of Benchmarking

There are several types of benchmarking that organizations may use to meet their needs. Strategic benchmarking focuses on the strategies of companies and involves a comparative analysis of the success and failures of these strategies. This can be achieved through customer satisfaction surveys. A limitation of strategic benchmarking is that it may be difficult to obtain strategy information on benchmarking partners.

Functional benchmarking is a tool used by companies to evaluate the success of core business functions. Although in functional benchmarking there does not need to be a focus on direct competition, the benchmark partner should be in a similarly characterized industry to allow for useful comparisons.

Another type of benchmarking is best-practices benchmarking. In this type of benchmarking, the work processes of an organization and the management processes behind them are examined.

Last, product benchmarking, or competitive product analysis, examines competitors' product

concept, costs, and alternative designs by analyzing the competitors' product.

Benchmarking in Healthcare

Benchmarking in healthcare typically involves comparing an organization's own data with a credible external source to facilitate decision making and informing the quality improvement process. Clinically, benchmarking is used to encourage providers to achieve a higher level of performance by changing and, as appropriate, standardizing practice patterns and to reduce resource utilization by identifying cost-effective treatment strategies. Additionally, managed-care organizations (MCOs) may use community health benchmarks to improve the overall care of a population. For example, MCOs may benchmark their performance of clinical population parameters, such as the performance indicators developed and employed by the NCQA related to obesity, vaccination status, and diabetes. Operationally, benchmarking is used to look at cost and efficiency parameters, such as length of stay, referral rates per 1,000 patients, cost per member per month, and costs of clinical ancillary departments. Furthermore, benchmarking is used for contracting purposes to help understand whether the assumptions underlying proposed contract rates are valid (e.g., cost per member per month, utilization data, cost data, severity scores). Regardless of the application, benchmarking has become an important tool for improving performance and to inform decision making.

The Benchmarking Process

Central to a successful benchmarking initiative is to clearly understand and articulate the goals of the project. Once established, four relatively standard phases are followed to execute the benchmarking project. The four phases are planning, data collection and analysis, integration, and action plan. The planning phase is the period that organizations use to set goals, identify what will be benchmarked, select the benchmarking partners or data source to benchmark performance against, and determine data collection methods. There are instances when an organization might choose to join a benchmarking initiative voluntarily or

because of the need to meet accreditation standards. An organization might belong to a group-purchasing organization, such as Premier, Inc. or the University HealthSystem Consortium (UHS), which have benchmarking databases and initiatives available to members. Alternatively, an organization might be part of an integrated health system that conducts benchmarking initiatives or participates in focused benchmarking initiatives, such as the National Anticoagulation and Benchmark Report (NABOR) initiative managed by EPI-Q, Inc. and funded through a pharmaceutical sponsorship. The goal setting and identification of benchmark partners are the most important components of this phase since the organization needs to establish what will be benchmarked and choose an appropriate partner or data source to make a realistic comparison.

In the data collection and analysis stage, the data are analyzed to identify competitive gaps or gaps between where practice should be and where it currently is for the participating organization. Expected performance levels are based on the top performers in the benchmark database. Future performance levels are then projected based on these gaps, and areas for improvement are identified. In some instances, a benchmarking initiative can identify gaps in national treatment patterns.

During the integration phase, the results from the analysis are communicated to the organization. The findings are also used to integrate the actions that will be taken as well as to compile objectives and goals for the organization.

In the action plan phase, the organization executes the action plan based on the recommendations. As the action plan is implemented, the organization must continue to monitor its performance, so that it reaches its optimal potential, and recalibrate the benchmarking measures as needed.

An example of the benchmarking process is the NABOR project, which identified a significant issue in the management of patients with thromboembolic disease who were at increased risk of developing stroke and hemorrhage. The NABOR benchmark database included 4,000 patients from 38 U.S. hospitals in which many practitioners believed that their institution's performance was at least average. The results of the benchmarking initiative revealed, however, that less than half of

the patients in this study received appropriate therapy that would mitigate the risk of experiencing a life-threatening event. Furthermore, even if patients received appropriate treatment for thromboembolism, the drug dosing delivered was either too low or too high, which increased the risk of experiencing a significant life-threatening event. The Steering Committee of the NABOR project, comprising leaders of national thought in the United States, communicated the results back to individual hospitals along with recommendations to be considered. The individual hospital project groups evaluated the recommendations and created an action plan for their respective institutions. In response to the recommendations, several hospitals in the NABOR project established anticoagulation clinics. And based on data from the NABOR benchmark database, those hospitals that did establish anticoagulation clinics were among the top performers.

Challenges for Benchmarking

There are many challenges that remain for organizations that use benchmarking. One of the challenges includes setting a benchmark that is both realistic and based on available and credible evidence. The intended benchmark should be feasible and practical, based on the organization's current performance in addition to the resources available for carrying out the action plan. Caution should also be used when evaluating data to ensure that a benchmark is in fact representative of best practices. It is possible that a benchmark database might have all the partners exhibiting average performance. If all organizations are striving toward "average" performance, it will make the participating organization also attempt to achieve only an average performance. Therefore, when an organization is evaluating whether to participate with partners or a vendor in a benchmarking initiative, it is important that the data reports on outcomes are at least in the upper quartile, if not the top decile, of performance.

Organizations may also face a difficulty in arriving at a consensus benchmark as clinicians and administrators may have different views on what is or is not an appropriate benchmark. Another challenge is to find a benchmarking partner that is appropriate and similar in nature for the organization to

compare itself against. It may be difficult, however, to find information that is publicly available on a competitor organization's strategies.

In conclusion, benchmarking has been used by organizations to outperform their competitors. This concept is starting to be routinely used by healthcare organizations to provide high-quality care under the increasing pressures of cost containment. In an increasingly competitive healthcare marketplace, benchmarking is a technique that will ensure the superior performance of healthcare organizations.

Mark A. Jewell and Jared Lane K. Maeda

See also Agency for Healthcare Research and Quality (AHRQ); Centers for Medicare and Medicaid Services (CMS); Health Report Cards; National Committee for Quality Assurance (NCQA); Outcomes Movement; Quality Management; Quality of Healthcare; University HealthSystem Consortium (UHC)

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<http://www.abhc.org>
- Centers for Medicare and Medicaid Services (CMS):
<http://www.cms.hhs.gov>
- National Committee for Quality Assurance (NCQA):
<http://www.ncqa.org>

BERWICK, DONALD M.

Donald M. Berwick is a leading authority in the area of healthcare quality and quality improvement. Berwick cofounded and is president and chief executive officer of the Institute for Healthcare Improvement (IHI), a not-for-profit organization based in Cambridge, Massachusetts, dedicated to improving quality in healthcare that was formed in 1991. Berwick is professor of health policy and management at the Harvard School of Public Health and clinical professor of pediatrics and healthcare policy at the Harvard Medical School. In addition, Berwick is an associate in pediatrics at Children's Hospital in Boston and a consultant in pediatrics at the Massachusetts General Hospital.

Berwick has published numerous articles in professional journals on the subjects of healthcare policy, decision analysis, technology assessment, and healthcare quality management. He also has authored or coauthored several books, including *Escape Fire: Designs for the Future of Health Care* (2004), *New Rules: Regulation, Markets and the Quality of American Health Care* (1996), and *Curing Health Care: New Strategies for Quality Improvement* (1990). And he is a member of several editorial boards, including the *Journal of the American Medical Association*.

Throughout his long and illustrious career, Berwick has served as the chair of various national committees, including the Health Services Research Review Study Section of the Agency for Health Care Policy and Research from 1995 to 1999 and the National Advisory Council of the Agency for Healthcare Research and Quality (AHRQ) from 1999 through 2001. From 1990 to 1996, Berwick served as the vice chair of the U.S. Preventive Services Task Force and

was the first “Independent Member” of the Board of Trustees of the American Hospital Association (AHA) from 1996 through 1999. Berwick cofounded and was a co-principal investigator for the National Demonstration Project on Quality Improvement in Health Care. Berwick is a past president of the International Society for Medical Decision Making and is an elected member of the national Institute of Medicine (IOM). He has served on the IOM’s governing council and has acted as a liaison to the IOM’s Global Health Board since 2002.

In 1997, President Clinton appointed Berwick to the Advisory Commission on Consumer Protection and Quality in the Healthcare Industry. This commission was cochaired by the Secretaries of Health and Human Services and Labor and it was given the responsibility to gain a better understanding of the issues facing the changing healthcare delivery system and build consensus on ways to ensure and improve healthcare quality.

Berwick is the recipient of numerous awards, including the Earnest A. Codman Award, the first Alfred I. DuPont award for excellence in children’s healthcare from Nemours, the Award of Honor from the AHA for outstanding leadership for improving healthcare quality, the Heinz Award for public policy, the Purpose Prize, and the William B. Graham Prize for Health Services Research. In 2004, Berwick was inducted as a fellow of the Royal College of Physicians in London. The following year, he was appointed as honorary Knight Commander of the Most Excellent Order of the British Empire.

Berwick received his bachelor’s degree from Harvard College, a master of public policy degree from Harvard’s John F. Kennedy School of Government, and a doctor of medicine degree from Harvard Medical School.

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See also Institute for Healthcare Improvement (IHI); Medical Errors; Outcomes Movement; Quality Indicators; Quality Management; Quality of Healthcare; Technology Assessment

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 Institute for Healthcare Improvement (IHI):
<http://www.ihl.org/ihl>

BIOTERRORISM

Bioterrorism is the intentional release of biological agents used to cause casualties to a population. Bioterrorism can also be directed to livestock, food, and the environment. The intrinsic features necessary for a bioterror agent include infectivity, virulence, toxicity, pathogenicity, incubation period, transmissibility, stability, and lethality. As of 2008, nine nations in the world are believed to have the capability for biologic warfare agent production: Iran, Israel, North Korea, China, Libya, Syria, Taiwan, Russia, and the United States.

Classification of Diseases/Agents

The Centers for Disease Control and Prevention (CDC) classifies particular bioterrorism diseases/agents into one of three categories: A, B, and C.

Category A diseases/agents are considered high priority due to their ability to be transmitted easily from person to person, which can result in high mortality rates. Public panic and social disruption may ensue, so special action for public health preparedness is necessary. This category includes anthrax (*Bacillus anthracis*), botulism (*Clostridium*

botulinum toxin), plague (*Yersinia pestis*), smallpox (variola major), tularemia (*Francisella tularensis*), and the viral hemorrhagic fevers (filoviruses and arena viruses). Except for botulism, these illnesses usually present initially as a flu-like illness with low-grade fever and fatigue.

Category B includes the second level of high-priority diseases/agents, with moderate dissemination and morbidity rates and relatively low mortality rates. These agents require specific CDC enhancements of diagnostic capability and disease surveillance. This category includes brucellosis (*Brucella* species); epsilon toxin (*Clostridium perfringens*); and food and water safety threats such as *Salmonella*, *Shigella*, vitrio cholera, glanders (*Burkholderia mallei*), melioidosis (*Burkholderia pseudomallei*), Q fever (*Coxiella burnetii*), ricin toxin from castor beans, staphylococcal enterotoxin B (as an incapacitating agent), typhus fever (*Rickettsia prowazekii*), and viral encephalitis (alpha viruses).

Category C includes diseases/agents that are emerging pathogens that can be engineered for mass dissemination in the future due to availability, ease of production, and potential for high morbidity and mortality. Examples include the napah virus and hantavirus.

Responsible Agencies

The public health infrastructure is the central component to monitor exposure to bioterrorism diseases/agents, identify the specific action required to prevent primary and secondary exposure, provide containment measures, and respond with necessary medical supplies. The basic premise of the National Response Plan (NRP, Version 4.0) developed by the U.S. Department of Homeland Security is that such incidences are handled at the lowest jurisdictional level possible.

Four federal agencies will likely be involved in any response to bioterrorism in the country: (1) U.S. Department of Homeland Security (DHS), (2) U.S. Department of Health and Human Services (HHS), (3) U.S. Department of Defense (DoD), and (4) U.S. Department of Veterans Affairs (VA).

Founded in 2002, the DHS contains four important programs: (1) National Disaster Medical System, (2) Strategic National Stockpile, (3) Metropolitan

Medical Response System, and (4) Federal Emergency Management Agency (FEMA).

The HHS encompasses more than 300 programs, including the following: CDC; Food and Drug Administration (FDA), Health Resources and Services Administration (HRSA), and the National Institutes of Health (NIH).

The DoD is the support agency for almost all the emergency functions of the NRP, under the Military Support to Civil Authorities (MSCA) doctrine. The MSCA is operationally directed through the U.S. Northern Command in Colorado Springs, Colorado.

Last, the VA through its hospital and clinic network will also play a support role.

The anthrax attacks in 2001 have demonstrated the need for a coordinated approach to identify and deliver antibiotics through the public health system. Subsequent to the attacks 33,000 individuals were initially placed on antibiotics, with about 10,000 individuals completing a 60-day course of antibiotics. The U.S. Army Medical Research Institute for Infectious Diseases (USAMRIID) performed approximately 19,000 anthrax surveys from clinical specimens. The cost to decontaminate the Hart Senate Office Building was estimated to have exceeded \$23 million. This was a secondary cost from attacks that involved only 22 cases.

Response Approaches

A comprehensive approach to biologic exposure would include incident command if a point source is identified, decontamination, quarantine, personal protection, diagnostic testing, vaccination, and antibiotic treatment.

Incident Command

When a specific source is identified, the incident command team is usually positioned uphill, upwind, or upriver from the site, and it should not be located near any building exhaust system. An isolation distance of at least 80 feet is recommended. First responders should handle the site of such an incident as a potential crime scene and should also be aware of explosive devices that could be used to disseminate the substances. First responders should also avoid wet surfaces or puddles.

Decontamination

In general, a biological attack is less likely to occur than a radiological or chemical terrorist attack. Because of the incubation period associated with a biological attack, patients will likely seek medical attention in waves from their primary-care physicians, in clinics, or in hospital emergency departments. Thus, decontamination procedures are less likely to be an issue.

Regarding specific decontamination issues, the focus is usually on contaminated environmental surfaces. Following the aerosolization of biological agents, rapid-assay kits should be used to identify contaminated surfaces, although false-positive results are common.

Plague is sensitive to heat and light and will not survive for a period of time outside the individual host. Botulinum toxin is destroyed by heating liquid or food to a temperature of 85 °C (185 °F) for at least 5 minutes. Through aerosolization, botulinum toxin usually becomes detoxified in the atmosphere within 2 days. Tularemia survives in cold, moist environments. Decontamination of environmental surfaces can be achieved by washing with a 10% bleach solution, then using a 70% concentration of rubbing alcohol after 10 minutes to wash away the bleach.

With regard to the hemorrhagic fever (yellow fever) virus, contamination linens should be placed in double bags and washed in hot water with bleach or autoclaved. Incineration is also an option. Equipment should be cleaned with a disinfectant or a 1:100 dilution of household bleach. It is not expected that the virus can persist for prolonged periods in the environment.

Chlorination or boiling of contaminated water is effective in eradicating cholera or tularemia. Smallpox does not survive for longer than 1 hour in the environment. Standard bleach or quaternary ammonia compounds can be used to clean environmental surfaces.

Quarantine

The term *quarantine* refers to the compulsory physical separation of individuals. It may involve movement restriction and/or segregation of individuals into specific geographical areas to halt the spread of a contagious disease. Such efforts may

include travel restrictions, public-gathering restrictions, and isolation of affected individuals. The federal government has the authority to impose these restrictions across state lines through the CDC. The DoD and FEMA may also assist in this effort.

Using quarantine, especially with patient isolation, must be considered for smallpox, plague, and viral hemorrhagic fever. With regard to quarantine for smallpox exposure, isolation of individual contacts, especially any person with a fever of more than 38 °C (100.4 °F) for a 17-day period, should be considered. The decision to quarantine is based on vaccination status, risk of exposure, and risk of disease.

Quarantine should be considered for livestock with Q fever or glanders, but it would be unlikely to infect humans. Quarantine is not necessary for anthrax, botulism, tularemia, brucellosis, cholera, *Cryptosporidium parfringens*, *Escherichia coli* (0157:H7), melioidosis, psittacosis, ricin, salmonella, shigella, straphylococcus, enteroroxin B, and typhus.

Personal Protection

With the biological agents that do not exhibit human transmission (i.e., anthrax, botulism, tularemia, brucellosis), standard precautions are appropriate. In addition to standard precautions, healthcare workers should wear a surgical mask if within 4 feet of a patient with plague (treated for less than 2 days). Airborne and contact precautions should be used for smallpox and viral hemorrhagic fever. Antibiotic contact prophylaxis should be considered for workers exposed to patients with plague, glanders, and melioidosis.

Essentially, personal exposures should be investigated in case of unprotected contact within 4 feet of vital exposures, breaches in protection, or febrile (more than 100.4 °F or 38 °C) illness in individuals occurring within 3 weeks of exposure.

Smallpox and viral hemorrhagic fever patients should be placed in private rooms with negative air pressure (6–12 air exchanges per hour) and dedicated medical equipment. Personnel should wear N-95 respirators, double gloves, impermeable gowns, goggles or face shields, and shoe covers.

Diagnostic Testing

Bacterial agents can usually be identified through traditional culture techniques and colony identification. Direct fluorescent antibody (DFA) techniques on capsule antigens are also a useful modality, especially when identifying bacterium in tissues. Polymerase chain reaction (PCR) can be used to detect and amplify genetic material from bacteria and is useful in identifying subtypes of organisms.

The Laboratory Response Network (LRN) was organized in 1999 and involves more than 150 clinical, military, veterinary, agricultural, and water and food testing facilities; it is coordinated through the CDC. It also has laboratories in Canada, the United Kingdom, and Australia. The purpose of the LRN is to rapidly identify threat agents and to conduct definitive testing for these agents. LRN laboratories are designated as sentinel (hospital-based laboratories), reference (to confirm the initial results), and national (designed to handle highly infectious agents and identify specific strains).

Viral testing can be complicated. For example, smallpox can be detected via dermatologic (vesicular) specimens obtained through barrier precautions by scraping the base of a vesicle or by obtaining a 4-mm dermal punch biopsy. Viral detection can be achieved via electron microscopy or with PCR technology. Serum analysis can be used to detect smallpox or viral hemorrhagic fever. The latter agent should be referred to the CDC or the USAMRIID.

Biological toxin identification also presents its own unique challenges. The mouse bioassay, using 30 ml of serum or gastrointestinal contents from the patient, is the primary modality to identify botulism toxin. Disease is usually evident within 24 hours. Electromyography (EMG) is the primary clinical modality in diagnosing botulism with its characteristic findings (repetitive nerve stimulation) at 20 to 30 Hz: short duration of motor unit potentials, polyphasic motor unit potentials, decreased amplitude of compound muscle action potentials of proximal muscle groups following a single nerve stimulus, and normal sensory and nerve conduction velocity. The CDC is currently developing a urinary ricin assay to be used with the LRN.

Vaccination

Vaccines, in various stages of testing, have been developed for anthrax, plague, smallpox, tularemia, hemorrhagic fever, cholera, Q fever, and typhus. The FDA licenses the vaccines for anthrax, hemorrhagic fever, Japanese B encephalitis, smallpox, and the plague.

The anthrax vaccine is a series of six doses. Used since 1997 by the U.S. military, the anthrax vaccine has been developed from a cell-free filtrate of the nonencapsulated attenuated strain of the bacterium. Systemic events (headache, fever, vomiting) occur in about 1% of individuals (women are at a greater risk than men), while the local reaction rate is about 3.6%.

The smallpox vaccination was routinely given to infants under the age of 1. It is estimated that about 50% of the U.S. population has not received the vaccine. It is thought that the duration of immunity is about 10 years, although neutralizing antibodies can be detected for up to 30 years.

Primary smallpox vaccination (preventive) that uses a bifurcated needle has been advocated for military and healthcare personnel. The military experience noted a rate of 82 per million vaccinated for generalized vaccinia. There were also 37 cases of myopericarditis (of 450,000 vaccinated), with recovery in all individuals. Encephalitis occurs at a rate of 1 in 300,000. Severe adverse reactions can be treated with vaccine immune globulin (VIG), with an intramuscular dose of 0.6 ml/kg.

Postexposure vaccination for smallpox may offer some protection if given within 4 days of exposure. Persons identified as being at risk (face-to-face contact with a household member or within 6.5 feet of a suspected case) should be considered for vaccination. The CDC is the sole distributor for the vaccine and VIG.

For hemorrhagic fever virus, the yellow fever live attenuated vaccine has limited usefulness due to the long period before an immune response develops (which can take up to 10 days), limited supplies, and an adverse-effect profile.

A live attenuated vaccine for tularemia is being developed, but as in the yellow fever vaccine, the long period for neutralizing antibody development (2 weeks) makes this vaccine less useful for postexposure prophylaxis.

The vaccines for Q fever, cholera, and botulism (using pentavalent antitoxin) are in various stages of development, as are the vaccines for viral encephalitis, Rift Valley fever, chikungunya fever, and Junin virus.

Antibiotic Treatment

Antibiotics are the mainstay of therapy for biological agents that are related to bacterial infection. For most of these agents (i.e., anthrax, plague, psittarosis, tularemia, cholera), a combination of a fluoroquinolone and doxycycline is the medical treatment of choice. Antibiotics are not useful therapy for botulism, ricin, or any viral agent.

Future Implications

In the event of a bioterrorism attack, patients exposed to the agents are likely to have subtle symptoms presenting in outpatient clinics. These patients, however, are likely to occur in large numbers, and thus healthcare facilities will need to follow the basics of emergency preparedness in order to deal with the entity.

Jerrold B. Leikin

See also Access to Healthcare; Emergency and Disaster Preparedness; Emergency Medical Services (EMS); Epidemiology; Health Communication; Hospital Emergency Departments; Hospitals; Public Health

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- Centers for Disease Control and Prevention (CDC): <http://www.bt.cdc.gov/bioterrorism>
- U.S. Department of Homeland Security: <http://www.dhs.gov>

BLUE CROSS AND BLUE SHIELD

The Blue Cross and Blue Shield brands are the most recognized health insurance brands in the country. The Blue Cross plans provide health insurance coverage for hospital services, while the Blue Shield plans provide coverage for physician services. There are currently 39 Blue Cross and Blue Shield companies in the United States, which collectively employ more than 150,000 individuals nationwide. Nearly 65.8 million members are enrolled in preferred provider organizations (PPOs), 12.9 million in fee-for-service plans, 15.8 million in health maintenance organizations (HMOs), and 4.8 million in point-of-service (POS) products. The Blue Cross and Blue Shield companies boast that they collectively insure one out of every three Americans. If all the Blue Cross and Blue Shield plans were one company rather than 39 confederated companies, it would be one of the top 20 employers in the nation. The plans have contracts with 90% of all U.S. hospitals and 80% of physicians. In recent years, the companies have been in the spotlight as they pursue business interests that some say contradict their history as nonprofit firms with a community-benefits tradition.

History

The original Blue Cross company was an outgrowth of the Baylor Plan, a nonprofit health insurance plan established in Houston, Texas, in 1929 by Francis Ford Kimball to provide coverage for teachers through a prepayment plan of 50 cents a month. The Houston plan was the forerunner of the Blue Cross plans that provided hospital services. The Blue Cross name and symbol were created in 1934 by E. A. van Steenwyk from St. Paul, Minnesota's group health plan. Blue Cross's former Chicago headquarters was housed in the American Hospital Association (AHA) building.

Blue Cross plans later developed in New York, New Jersey, and California. By 1935, there were 15 plans in 11 states. The number of Blue Cross plans had grown from 56 to 80 between 1940 and 1945, and enrollment increased from 6 million to 19 million.

During this period, a comparable plan to cover physician services was also established in the states of Washington and California. From these physician plans, the medical societies around the nation began to develop prepaid insurance programs that covered physician services. In 1946, a number of plans banded into a national group called the Associated Medical Care Plans, overseen by the American Medical Association (AMA), and informally adopted the Blue Shield as its symbol. This organization eventually became the Blue Shield Association (BSA). The Blue Shield plans that provided physician services had an early enrollment of 3 million. In the 1960s, there were 148 Blue Cross and Blue Shield plans in the United States; some providing hospital insurance under the Blue Cross plans and others providing physician coverage under the Blue Shield plans.

In 1961, Walter J. McNerney (1925–2005), who was recruited by the Michigan Blue Cross plan from the University of Michigan to examine the hospital and medical care costs and insurance coverage in that state, became the president of the Blue Cross Association. The McNerney era was marked by numerous changes in the nation's healthcare system, including the development of the federal Medicare and Medicaid programs in 1965, utilization and case management initiatives, the collaboration of plans to offer national products, preadmission testing programs, and

HMO sponsorship. McNerney was instrumental in moving the Blue Cross plans away from the control of the AHA, an early sponsor of the hospital insurance concept, and the AMA, which managed the BSA. In 1972, the Blue Cross and Blue Shield companies formally separated from the AHA, which ushered in the tensions between the organizations.

McNerney was intent on merging the Blue Cross and the Blue Shield plans and ultimately undertook an extensive strategic planning initiative to examine the plans and seek cooperation of the plans across the nation. His stated goal was to limit the number of plans operating in the states. The plans were developed under three different organization types—stock, mutual, and nonprofit. These organization models continue to exist in 2008. The nonprofit plans were established with no individual or organizational entity with an ownership interest, and control rested with the board of directors. The stock companies are those in which the financial ownership consists of capital stock, which is divided into shares, and control rests with stockholders. Mutual companies are corporations without capital stock; ultimate control is with policyholders. Although there has been considerable debate in recent years about the ownership type of the company, the ownership of the plans is transparent to its members.

During the 1980s, hospital cost escalation was considerable. As a result, President Jimmy Carter attempted to introduce cost controls by legislating caps on health spending. The Carter administration desired to limit annual hospital cost increases and capital spending as well as physician reimbursement under Medicare and Medicaid. The reception to these proposals was lukewarm. While the voluntary effort to control healthcare costs was introduced, there was little done to implement healthcare change. When Ronald Reagan was elected president in 1982, a procompetitive, anti-regulatory strategy toward controlling healthcare costs was introduced. The HMO model took hold, with its prospective payment that rewarded providers for minimizing costs. Alain Enthoven, a Stanford economist and consultant to the Reagan administration, introduced the consumer choice philosophy, which advocated cost-efficient benefit programs. With the consolidation of the Blue Cross and Blue Shield plans, the development of

the Blue Cross Blue Shield Association (BCBSA), and the move to interplan collaboration for the benefit of the plan members, new HMO products were introduced with the stated benefit of controlling healthcare utilization and costs.

Blue Cross and Blue Shield continued to collaborate with federal and state governments in providing healthcare benefits. The BCBSA was instrumental in advocating for the benefit management of the federal Medicare and state Medicaid products along with HMO and indemnity products. It became a major benefits manager for the federal government when the Federal Employee Health Benefits Plan was introduced in 1960 to provide coverage for 9 million federal employees and their dependents, including members of the U.S. Congress.

Conversion From Nonprofit to For-Profit Status

In 1994, BCBSA voted to change its charter to allow for-profit conversions of plans if the plans met specific guidelines. These included safeguards such as control of branded subsidiaries by the parent plans, accreditation for managed-care companies, codes of conduct for officers, rules for disclosure of records, agreement to mandatory dispute resolution, and financial standards and guarantees. Blue Cross Blue Shield of California was the first conversion, and it changed its name to Wellpoint. Since 1994, 14 of the 42 state BCBS plans in the United States have changed their tax status from nonprofit to for-profit. The stated rationale for conversion of tax status is to raise capital to better compete with commercial insurance companies, such as Aetna, Cigna, and the UnitedHealth Group.

In 1994, as the first plan to convert, Blue Cross of California received minimal public scrutiny. The denial of Blue Cross and Blue Shield of Maryland's for-profit conversion by the State Insurance Commissioner in March 2003, followed by the Kansas Supreme Court blocking the acquisition of the Blue Cross plan by the for-profit Anthem and the subsequent retractions of the New Jersey and North Carolina Blue Cross and Blue Shield plans of their proposed conversion initiatives have raised the visibility of the conversion phenomenon. As the numbers of plan

conversions increased to include California, Colorado, Connecticut, Georgia, Indiana, Kentucky, Maine, Missouri, Nevada, New Hampshire, New York City, Ohio, Virginia, and Wisconsin, the public is raising questions about the consequences of such conversions. From 1990 to 1993, Blue Cross and Blue Shield plans in Maryland, New Jersey, New York, West Virginia, and Washington, D.C., encountered a series of U.S. Senate investigations into their financial management practices. In response to these investigations, the BCBSA developed a code of conduct to guide plan entrepreneurship.

As the U.S. economy changed, large multistate clients wanted an extensive network of providers, affordable products, efficient customer service, and limited intrusion by the insurer into medical management. Blue Cross Blue Shield's competitors provided such an alternative with their products and services. Blue Cross responded in kind to these competitor threats by investing extensively in information and billing systems, cultivating excellent provider relations, and introducing preferred provider product offerings with limited medical management. The BCBSA's introduction of the Blue Card benefit in 1994 that allowed interplan use of services by members was an initiative to provide a rational system of services as members moved between states and traveled outside the continental United States.

Health Insurance Consolidations

The U.S. healthcare environment changed dramatically between 1980 and 2002 for health insurance companies and hospitals. Large multistate insurance companies providing health insurance coverage in conjunction with financial, casualty, and life insurance had become the norm. It quickly became apparent that healthcare required a different type of insurance, leading companies to divest or expand into health insurance. For example, MetraHealth was formed in 1995 through the combination of the group healthcare business of Metropolitan Life Insurance Company and the Travelers Insurance Company. MetraHealth served millions of Americans with its healthcare plans, and it operated in all 50 states. The company's managed-care networks included 29 HMO licenses, 72 point-of-service

networks, and PPOs managed in more than 90 markets nationwide. In addition to its full range of both managed care and indemnity plans, the company offered managed behavioral health, managed pharmacy, data analysis, demand management, managed workers' compensation, and third-party administrator services. In 1995, UnitedHealth Group purchased MetraHealth, bringing the services of MetLife and Travelers under its umbrella.

In 1990, the Associated Insurance Companies of Indianapolis (the forerunner to Anthem Blue Cross and Blue Shield located in Indiana, which has grown to incorporate more Blue Cross plans under its umbrella) purchased the Dallas-based American General Insurance Company. This acquisition of a diversified insurance company that would compete with other Blue Cross and Blue Shield plans outside Indiana introduced plan competition and diversity in the Blue Cross and Blue Shield organization.

Between 1996 and 1998, Aetna Insurance Company acquired U.S. Healthcare, and then the healthcare divisions of The New York Life Insurance Company (NYLIC) and Prudential Insurance Company, making it the largest health insurance company in the nation, covering 21 million lives. Aetna, as the largest health insurer, expanded into healthcare and eliminated unprofitable lines of business. Aetna's management decided that it could no longer be the "department store of insurance." Smaller specialty firms that possessed greater levels of management focus and were quicker to adapt to market changes were undermining its role as a traditional multiline insurer trying to compete in all insurance markets. Aetna's decision in 1991 to exit individual health lines ended a 91-year-old coverage. In 1991, it exited the automobile and homeowners insurance markets, and in 1996, it left the property casualty market, based on market profitability and company expertise and resources.

As the largest health insurance company between 1998 and 2000, Aetna became the market leader. With its acquisitions U.S. Healthcare, Prudential, and NYLIC, providers were finding that the major part of their business was being dictated by one company that had previously been four separate companies. In 1999, the provider community started to revolt against the consolidation and

mergers in the health insurance industry, HMO capitation, and failure of insurers to adhere to prompt payment laws.

With the consolidation in the hospital and commercial insurance industries, the nonprofit Blue Cross plans began to respond to the competition presented by large national and regional insurance plans. The conversion phenomenon and BCBSA's development of a division to handle national accounts, The Blue Card, that crosses the jurisdictional boundaries of state Blue Cross plans represented an internal management decision to respond to the changes in the hospital and insurance industries. The Blue Card initiative was an acknowledgment that multistate employers wanted to deal with a corporate entity that could resolve interstate insurance issues and did not want to negotiate between multiple Blue Cross plans. It also recognized that the Blue Cross and Blue Shield organization, regardless of its ownership or state boundaries, needed to provide a seamless system of care for its member companies and their employees. When the public viewed the Blue Cross plans, they saw one company, not 39 independent licensees of the BCBSA. Its commercial competition was investing tremendous resources into providing national services, and The Blue Card introduced a national product for the companies. In addition, the Blue Healthcare Bank was established in 2007 to provide healthcare-related banking in all 50 states of the nation. The bank services customers with high deductible health savings accounts (HSAs). The Blue Cross bank was a direct result of the commercial insurance giant UnitedHealth Group's Exante Bank acquisition.

The internecine warfare between the various Blue Cross plans appears to have settled down in 2008. Scott Serota, the president and CEO of the BCBSA, has quietly introduced new products with The Blue Card, pursued the collaboration with America's Health Insurance Plans (AHIP) to promote portability standards for patient information through the electronic health record, promoted the Patient-Centered Primary-Care Collaborative to secure primary-care medical homes for enrollees, and promoted Medicare E-prescribing. Once again, Blue Cross and Blue Shield is increasing its membership, innovating with new products and programs, and collaborating with other insurers to advance the insurance industry.

Future Implications

The Blue Cross and Blue Shield companies have undergone a dramatic change since the early founding of the company in 1929. The company has endured because of its early association with the hospital industry. The cost control movement, the organization's strategic plan, internal company reorganization, the procompetition movement, new product offerings, and the growth of the uninsured has fundamentally changed Blue Cross as it was originally envisioned. Nonetheless, the Blue Cross and Blue Shield companies remain a formidable brand and continue to dominate other insurers in their local markets.

Diane M. Howard

See also Committee on the Costs of Medical Care (CCMC); For-Profit Versus Not-for-Profit Healthcare; Health Insurance; Health Maintenance Organizations (HMOs); Health Savings Accounts (HSAs); Kimball, Justin Ford; McNerney, Walter J.; Preferred Provider Organizations (PPOs)

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- American Hospital Association (AHA):
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- Blue Cross Blue Shield Association (BCBSA):
<http://www.bcbs.com>

BROOK, ROBERT H.

Robert H. Brook is an internationally recognized expert on quality assessment and quality assurance. Brook and his colleagues at the University of California, Los Angeles (UCLA) and the RAND Corporation are widely credited with developing pioneering methods for studying the appropriateness of medical care and measuring quality. Brook's seminal work on healthcare quality and health status measurement has led to the development of policies for improved health and quality. His research has also created the scientific basis for deciding if many different medical and surgical procedures are used appropriately.

Brook is professor of medicine and health services at the UCLA, where he directs the Robert Wood Johnson/UCLA Clinical Scholars Program. He is also vice president and director of the RAND Corporation's Health Sciences Program.

Brook received his bachelor of science degree from the University of Arizona. He went on to receive a medical degree from Johns Hopkins Medical School and a doctorate of science degree from Johns Hopkins School of Hygiene and Public Health.

Since 1974, Brook has served on the faculty of the UCLA. Over the course of more than 30 years at that university, he has trained many healthcare industry leaders. As the director of the Robert Wood Johnson Clinical Scholars Program, he has been pivotally involved in training physicians to take an active role in policy and to focus on healthcare at the community level.

Brook's contributions have been recognized with a number of awards and honors, including the Baxter Foundation Prize for excellence in health services research, the Institute of Medicine's Lienhard Award, the Rosenthal Foundation Award of the American Association of Physicians, the Peter Reizenstein Prize, the Distinguished Health Services Research Award of the Association of Health Services Research, the Robert J. Glaser Award of the Society of General Internal Medicine, the National Committee for Quality Assurance (NCQA) Health Quality Award for the pursuit of healthcare quality at all levels of the health system and research, and America's 2000 Advocacy Award for Sustained Leadership at the National Level. Brook

also was selected as one of the 75 Heroes of Public Health by Johns Hopkins University in 1991. He is a member of the National Academy of Sciences, Institute of Medicine (IOM); the American Society for Clinical Investigation; the American Association of Physicians; and the Board of Overseers at the University of California Davis Medical School.

Brook has published nearly 300 medical articles throughout his career. As a board-certified internist, he has conducted revolutionary work in the field of quality measurement that has led to the development of measurement tools used by the government, physicians, and other groups. Brook has focused specific attention on developing health status and quality measures for vulnerable populations, including the elderly, HIV-positive individuals, and special-needs children.

Recently, Brook was appointed the chair of a panel on coronary artery bypass graft surgical outcomes that will advise California's Office of Statewide Health Planning. Brook has dedicated his career to improving the effectiveness and efficiency of the healthcare delivery system, and his work has transformed the way in which healthcare quality is evaluated. Because of Brook's substantial contributions in this field, policymakers have incorporated his research findings into national healthcare policy standards.

Jared Lane K. Maeda

See also Clinical Practice Guidelines; Public Policy; Quality Indicators; Quality of Healthcare; RAND Corporation; Robert Wood Johnson Foundation (RWJF); Vulnerable Populations

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BROOKINGS INSTITUTION

The Brookings Institution is one of the nation's oldest research and policy organizations dedicated to questions of governance and the economy. Although the Brookings Institution is now only one of the many Washington think tanks, its long history of influence and volume of research output ensure that it remains a prominent one. While healthcare issues have not historically been its chief focus, the relationship of health to economics is an emerging research interest, and the Brookings Institution has immersed itself in the debates surrounding healthcare and national spending priorities.

History

The Brookings Institution was formed in 1927 by the merger of the Institute for Governmental Research and the Carnegie Corporation's Institute of Economics, two small research and policy organizations. These two predecessor organizations were formed to provide the federal government with statistics and research aimed at meeting administrative and budget policy needs arising from the growth of government in the early 20th century and U.S. involvement in World War I.

A third institution, the Brookings Graduate School, was also involved in the merger. The school was founded in 1922 as an independent institution by Robert S. Brookings (1850–1932), a

businessman, philanthropist, and governmental reformer. Brookings was a friend of the American industrialist Andrew Carnegie (1835–1919) and played a leading role in improving Washington University's School of Medicine, which, as a result, was described in positive terms in Abraham Flexner's 1910 report on the state of medical education in the United States. Brookings shared Carnegie's interest in questions of public policy and governance and had founded his school to contribute to the education of students interested in serving in the government.

The new institute, headquartered in Washington, D.C., and, in its original location, close to the White House, was to serve as a source of professional and nonpartisan research and advice to the federal government. The Institution's first president was the economist Harold G. Moulton.

The Great Depression and President Franklin D. Roosevelt's attempts to deal with it provided the Brookings Institution with an enormous challenge. Despite the institute's later reputation as an advocate of liberal policies, Brookings researchers were critical of Roosevelt's New Deal policies and their curbs on what they considered to be the prerogative of the free market. The institute was similarly critical of aspects of the policies of the Truman administration.

Despite its criticisms, however, the Brookings Institution grew in prominence, becoming especially influential during the period of its second president, Robert Calkins (1952–1967). During this time, the John F. Kennedy and Lyndon B. Johnson administrations frequently consulted the Institution. In addition, the Institution added foreign policy research to its traditional focus on domestic policy issues.

Over the years, the Institution evolved into the archetype of the powerful Washington think tank. During the tenure of its third president, Kermit Gordon (1967–1977), Brookings also became the target of rhetorical hostility from the executive branch. Members of the Nixon administration openly criticized the institute because of its influence and the perceived opposition of its staff to the President's policies.

Bruce MacLaury became Brookings's fourth president in 1977, followed by Michael Armacost, a former staffer for President Ronald Reagan, in 1995. Some commentators remarked

at the time that Armacost's appointment represented an official recognition by the institute of the new prevalence of conservative ideas in Washington.

The current president of the Brookings Institution is Strobe Talbott, a former journalist and U.S. secretary of state in the Clinton administration. Talbott became president of the institute in 2002.

Current Activities

While the Brookings Institution has not historically emphasized healthcare issues in its research, in July 2007 it created the Engelberg Center for Health Care Reform. The founding director of the new center is Mark B. McClellan, former commissioner of the U.S. Food and Drug Administration and administrator of the Centers for Medicare and Medicaid Services (CMS). The center will serve as the hub of Brookings activities related to health policy. Its mission is to effect lasting change by providing practical solutions that result in high-quality, innovative, and affordable healthcare. The center plans to focus on four key areas: improving the quality of medical care, increasing access to affordable health insurance coverage, reducing the costs of public and private programs, and encouraging rapid and effective innovation for the development of more personalized medicines.

Other areas of the institute also focus on healthcare. The Health Policy Initiative sponsors events, coordinates research, and publishes papers on healthcare spending and resource allocation. The Global Health Financing Initiative, organized in 2006 with funding from the Bill and Melinda Gates Foundation, focuses on similar issues in the countries of the developing world. The Wolfensohn Center for Development (initiated in 2006 and named after James Wolfensohn, the former head of the World Bank), the Hamilton Project (named after Alexander Hamilton), and the Center on Children and Families also deal, at least peripherally, with health issues. An undertaking launched in 1998 with the American Enterprise Institute (AEI), another prominent think tank, is called the Joint Center for Regulatory Studies and deals with topics including health policy and economics.

Publications

The Brookings Institution has a large number of outlets for the dissemination of its research efforts. *The Brookings Bulletin*, a quarterly launched in 1962, served as its house organ until 1982, when it was succeeded by the quarterly *Brookings Review*. The *Brookings Review* was retired in 2003, but the Institution currently publishes an array of periodical titles on an annual or semiannual basis. Among these journals, articles on medicine, public health, medical insurance, and other health-related topics appear in the *Brookings Papers on Economic Activity* and *The Future of Children*, copublished with Princeton University's Woodrow Wilson School of Public and International Affairs.

The Brookings Institution Press also publishes a wide variety of books dealing with aspects of medicine, medical education, medical insurance, economic and social health policy, and biomedical technology.

In addition to its publishing efforts, Brookings researchers also submit items to newspaper opinion and editorial pages, appear before U.S. congressional panels, and make themselves available for speaking engagements and broadcast media appearances.

Kevin O'Brien

See also American Enterprise Institute for Public Policy Research (AEI); Cato Institute; Flexner, Abraham; Gates Foundation; Health Economics; Public Policy; RAND Corporation; Urban Institute

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CANADIAN ASSOCIATION FOR HEALTH SERVICES AND POLICY RESEARCH (CAHSPR)

The Canadian Association for Health Services and Policy Research (CAHSPR) is Canada's largest and most diverse health services and policy research association. Incorporated in 2004, the CAHSPR evolved from the Canadian Health Economics Research Association (CHERA), in response to changes in Canada's health services research landscape. The CHERA, which began in 1985, primarily focused on health economics and policy. Over the years, it evolved into a broader organization with diverse members, including not only health economists but also health services researchers, policy analysts, and other professionals. Over time, there was a belief by many outside individuals and organizations that because of its name and official objectives, the CHERA was narrowly focused on health economists. The association's members saw this as a significant barrier to the organization's continued growth.

In 2002, the leadership of the CHERA decided to survey its members as well as external stakeholders to determine if there was interest in broadening the mandate and membership of the organization. The response was overwhelmingly supportive of making changes to the organization and having it become a national, broad-based, interdisciplinary health services and policy research association for practitioners, users, and students

of health services and policy research. The proposed new organization was formally introduced at the Institute of Health Services and Policy Research symposium that was held in November 2003. And the CHERA transitioned into the CAHSPR.

Key Features

The key features of the CAHSPR are as follows: It is multidisciplinary; it is committed to improving the quality, relevance, and application of health services and policy research; its membership includes both health services and policy researchers from a wide range of disciplines and consumers of research from government and nongovernment organizations and industry.

These features allow the CAHSPR to be in a unique position to foster and support linkages between researchers and decision makers; to promote knowledge transfer, exchange, and integration; to encourage education and training; and to advocate for research and its more effective use in planning, practice, and policy making.

Member Services

The CAHSPR provides a number of services to its members and others, including organizing an annual conference, publishing a peer-reviewed journal, distributing information through a weekly listserv, and supporting interdisciplinary research and knowledge transfer.

One of the most important activities of the CAHSPR is its annual conference. The association's inaugural conference was held in Montreal in May 2004. The themes of this conference were "Learning From International Comparisons" and "Knowledge Exchange Between Researchers and Decision-Makers." In September 2005, the association's second annual conference was again held in Montreal, this time in conjunction with the Jean-Yves Rivard Conference and the International Conference on the Scientific Basis of Health Services. The theme was "Canada's Health Priorities: Building and Maintaining Research Capacity." The third annual conference, which took place in September 2006, had the theme "Insight, Interaction and Innovation: New Approaches to Health Services, Research, Policy and Management." It was held in conjunction with the National Healthcare Leadership Conference in Vancouver, British Columbia. In June 2007, the association's fourth annual conference, "Leading, Linking and Listening: Knowledge Exchange at the Frontiers of Health Services and Policy Research," was once again held in conjunction with the National Healthcare Leadership Conference in Toronto. The association's fifth annual conference was held in May 2008 at Gatineau, Quebec. Its theme was "Bridging Silos." Whenever possible, the association holds its conferences consecutively or concurrently with other organizations to maximize the opportunity for collaboration between other researchers and decision makers.

The CAHSPR publishes *Healthcare Policy*. This quarterly journal includes original scholarly and research articles that support health policy development and decision making. The articles address diverse topics such as governance, organization, and service delivery to funding and resource allocation. The journal's diverse readership includes health system managers, practitioners, policymakers, educators, and academics. In line with the interdisciplinary nature of the CAHSPR, the journal is open to researchers from a broad range of disciplines. The submission of articles from decision makers and researcher–decision maker collaborations that address knowledge exchange and application are strongly encouraged.

Healthcare Policy has adopted the themes identified in 2004 through a national consultation initiated by the Canadian Health Services Research

Foundation, the Institute of Health Services and Policy Research (within the Canadian Institutes of Health Research), the Canadian Institute for Health Information, the Canadian Coordinating Office for Health Technology Assessment, the Advisory Committee on Governance and Accountability of the Federal-Provincial-Territorial Conference of Deputy Ministers of Health, and the Health Statistics Division of Statistics Canada. The consultation was intended to establish both a primary research agenda and a research synthesis agenda to recognize the immediate needs of policymakers, managers, and the public for accessible summaries of research evidence. The research themes that were identified and drive the content of *Healthcare Policy* include workforce planning, training, and regulation; management of the healthcare workplace; timely access to quality care for all; managing for quality and safety; understanding and responding to public expectations; sustainable funding and ethical resource allocation; governance and accountability; managing and adapting to change; linking care across place, time, and settings; and linking public health to health services.

The CAHSPR distributes an informational e-mail to all members on a weekly basis. The e-mail includes information on a variety of topics of importance to members, including career opportunities, CAHSPR activities and upcoming events, links to course materials for student members, and current research and policy items of interest to members.

These services allow the association to provide support for interdisciplinary research and knowledge transfer. It provides a home for decision makers from the healthcare sector who are interested in research outcomes and participating in research collaborations. In addition, the association works closely with the Canadian College of Health Services Executives (CCHSE), the Canadian Institute for Health Research (CIHR), the Canadian Health Services Research Foundation (CHSRF), and other organizations to strengthen the connection between researchers and research users within Canada's healthcare system.

Organization

The CAHSPR is governed by a board of directors, which is composed of a president, president-designate,

past president, secretary (appointee), treasurer (appointee), a minimum of six and a maximum of nine directors, a student representative (nonvoting), representatives from each study group (nonvoting), current conference convener (nonvoting), upcoming conference convener (nonvoting), the Emmett Hall Foundation president (ex officio), and an executive director (nonvoting). The president, president-designate, past president, secretary, and treasurer are the officers of the association. The day-to-day operation of the association is the responsibility of an executive director.

Gregory S. Finlayson

See also Canadian Health Services Research Foundation (CHSRF); Canadian Institute of Health Services and Policy Research (IHSPR); Health Services Research in Canada

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- Canadian Health Services Research Foundation (CHSRF): <http://www.chsrf.ca>
- Canadian Institutes of Health Research (CIHR): <http://www.cihr-irsc.gc.ca>

Its immediate objective was to bring together provincial governments, health institutions, and the private sector as partners to engage in practical research that would identify what works in Canada's healthcare system, what does not work, and what procedures and interventions require further evaluation. The original commitment through the federal budget was CAN\$65 million. While it was originally envisioned that the Medical Research Council of Canada would administer the fund, the Canadian College of Health Services Executives (CCHSE) allowed its own foundation to be transformed into the Canadian Health Services Research Foundation. In November 1996, the CCHSE's board of directors changed the name and objectives of the foundation—those changes were subsequently approved by Industry Canada.

Purpose

According to the supplementary letters patent, the CHSRF was established for the purpose of identifying research gaps and needs in the field of health services research and defining priorities; the funding of peer-adjudicated research into the management, organization, and effectiveness of health services, including research into the outcomes of health-affecting interventions as well as into the organization and management of institutional and noninstitutional models of health services delivery; and the promotion of best practices of health services delivery and the communication of research outcomes.

As an endowment, the CHSRF was designed to work at arm's length from government, with stable funding at a sufficient level to have an impact on health services in Canada. At the time of its formation, the CHSRF received CAN\$66.5 million. Since then, it has received a total of CAN\$151.5 million in endowment contributions. During its history, the foundation has used its endowed funds to support applied research projects, open grants competitions focusing on priority themes identified by managers and policy-makers, the development of the Canadian Institutes of Health Research (CIHR), education and mentoring Chairs, regional training centers, nursing research, and knowledge transfer. The most recent contribution of CAN\$25 million was specifically

CANADIAN HEALTH SERVICES RESEARCH FOUNDATION (CHSRF)

The Canadian Health Services Research Foundation (CHSRF) was created through the Canadian federal budget in March 1996. It was established in response to federal and provincial government interest in renewing Canada's healthcare system.

directed at developing the capacity of health service executives and their organizations to use research.

Mission and Vision

Between 1997 and 2002, the mission of the CHSRF was to improve the health of Canadians by promoting and funding health services research and increasing its quality, relevance, and usefulness for policymakers and managers by encouraging in its peer-reviewed funding a focus on issues of importance for decision makers, the regular sharing of results and issues between decision makers and researchers, the persuasive communication of research results and the training and support of health services and nursing researchers; funding syntheses of research and experience and encouraging user-friendly communication of research results and their implications for decision makers; working with health service organizations to increase their ability to acquire, appraise, adapt, and apply research to policy making and management; and developing relationships with partners and cosponsors who uphold the foundation's goals of generating and promoting the use of health services and nursing research that is relevant to decision makers' needs.

As the result of a 2002 external review, the CHSRF worked with the Canadian Institutes of Health Research (CIHR) and transferred research project funding to the CIHR in favor of supporting four to six programs of research, capacity development, and knowledge transfer.

The current vision of the CHSRF is "a strong Canadian healthcare system driven by solid, research-informed management and policy decisions," and the mission of the foundation is "to support evidence-informed decision making in the organization, management, and delivery of health services through research, building capacity and transferring knowledge." The strategy adopted by the CHSRF to work toward this vision and mission is "to bring researchers and decision makers together regularly to understand each other's goals and professional culture, influence each other's work, and forge new partnerships." The

foundation has also established strategic objectives to create high-quality new research that is useful for health service managers and policymakers (especially in the foundation's priority theme areas); to increase the number and nature of applied health services and nursing researchers; to get needed research into the hands of health system managers and policymakers in the right format, at the right time, and through the right channels; and to help health system managers, policymakers and their organizations to routinely acquire, appraise, adapt, and apply relevant research in their work.

Priorities and Programs

The CHSRF supports management and policy research in health services and nursing, and the dissemination of research results through research funding for both researchers and decision makers, training opportunities for senior decision makers, training and personnel development for new and established researchers from within the field as well as those who are prepared to apply skills from other fields to health systems, services and resources to support communication and research dissemination, and recognizing excellence and achievement in doing, supporting, communicating, and using research results. In 2005, CAN\$13.6 million was allocated for these purposes.

The CHSRF groups its priorities into various themes. While these change over time, in 2008, they included the following: managing for quality and safety, management of the healthcare workplace, primary healthcare, nursing leadership, organization, and policy. Past themes have included centralization and aggregation of health services, informed public participation in decision making, health and human resources, and managing continuity. Current priorities are posted on the CHSRF's Web site.

Specific activities of the CHSRF include research, exchange, and impact for system support; commissioned research; nursing research fund; an executive training for research application program; building capacity for applied and developmental research and evaluation in health services and nursing; the Harkness Associates program; the

health services research advancement award; and bringing out publications designed to translate research into information that is accessible to decision makers.

Organization

Located in Ottawa, the CHSRF is governed by a board of trustees of up to 14 people, many of whom are researchers and decision makers. Trustees are elected for 3-year renewable terms. The CHSRF employs a staff of approximately 50 individuals, and it is led by a chief executive officer who is responsible for the day-to-day operations of the foundation.

Gregory S. Finlayson

See also Canadian Association for Health Services and Policy Research (CAHSPR); Health Services Research in Canada; Lomas, Jonathan; Quality of Healthcare

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CANADIAN INSTITUTE OF HEALTH SERVICES AND POLICY RESEARCH (IHSPR)

The Canadian Institute of Health Services and Policy Research (IHSPR) is 1 of 13 institutes of the Canadian Institutes of Health Research (CIHR). The CIHR were created in June 2000, when an act of the Canadian Parliament came into force. This act states that the CHIR will achieve their objectives through “encouraging interdisciplinary, integrative health research through the creation of health research institutes” and established a governing council, which is responsible for the creation of health research institutes. The purpose of the institutes is to support individuals, groups, and communities of researchers for the purpose of achieving the objectives of CIHR. In July 2000, the governing council of CIHR established the IHSPR, and in December 2000, Morris Barer of the University of British Columbia was appointed its first scientific director.

The CIHR are considered “virtual” institutes in that they are not housed in a central location and can be considered a focal point for networks of researchers with common interests. The location of each institute’s office is determined by its respective scientific director. For the first 5 years of its operation, the IHSPR was located in Vancouver, British Columbia. In September 2006, Colleen M. Flood was appointed the scientific director of IHSPR, and with this appointment, the institute’s office was relocated to Toronto.

Vision, Goals, and Objectives

Like all the institutes, the IHSPR’s “objective is to excel, according to internationally accepted standards of scientific excellence, in the creation of new knowledge and its translation into improved health for Canadians, more effective health services and products, and a strengthened Canadian healthcare system.”

The IHSPR’s vision, mandate, values, and guiding principles are discussed below.

Vision

The vision of the institute is to strengthen Canada's healthcare system through health services and policy research. Specifically, its vision is of a vibrant community of excellent researchers who conduct outstanding health services and policy research that informs Canadians about their healthcare system, is used by decision makers to strengthen Canada's healthcare system, and influences health and social policy in Canada and abroad.

Mandate

The mandate of the institute is to support health services and policy research and its timely translation. Specifically, it is to support outstanding research, capacity building, and knowledge translation initiatives designed to improve the way healthcare services are organized, regulated, managed, financed, paid for, used, and delivered, in the interest of improving the health and quality of life of all Canadians.

Values

The institute's fundamental and core values that influence its decision making, strategic activities, and operations are (a) international excellence; (b) ethically responsible research; (c) scientific rigor; (d) diversity in theoretical and methodological approaches; (e) innovation; (f) impartial, arms-length, peer, and merit adjudication; (g) involvement and recognition of, and respect for, a wide range of partners from all relevant sectors, provinces, and other countries; and (h) a transparent approach that facilitates accountability to all Canadians.

Guiding Principles

The institute is guided in its strategic and operational activities by the following principles: (a) provide leadership through working collaboratively with key partners in identifying, coordinating, focusing, and integrating health services and policy research and knowledge translation priorities for Canada; (b) support superb research and researchers involved in addressing the problems confronting healthcare decision makers of today

and tomorrow; (c) encourage productive collaboration among researchers who use diverse methods and offer varied types of expertise; (d) uphold the principles of academic freedom, independence, and the right to publish; (e) address, wherever possible and practical, regional and other disparities in Canada's capacity to undertake outstanding research in the domain of the institute's mandate; (f) facilitate access to data that can be used to conduct health services and policy research, at the same time working with partners to ensure that access protocols respect the privacy of information on individual patients, providers, and organizations; (g) support initiatives that will result in the timely translation of relevant research knowledge; (h) provide timely responses to all those who communicate with staff of the institute; and (i) interact with all individuals and organizations with integrity and respect.

As a dynamic organization, the specific goals and objectives of the IHSPR are expected to evolve as changes occur in the environment in which the institute operates. However, strategic planning is guided by five key areas, corresponding to the institute's planning, reporting, and accountability structure: (1) creation and synthesis of outstanding research; (2) building a community of outstanding researchers in innovative environments; (3) translating health research into action; (4) developing and nurturing effective partnerships and public engagement; and (5) promoting and facilitating organizational excellence in all institute activities, and with the CIHR generally. The institute's current goals and objectives are listed in its Web site.

Activities and Funding

To achieve its mandate, the IHSPR initiates and administers funding programs, supports knowledge transfer between researchers and decision makers, initiates the establishment of strategic partnerships, and develops and disseminates publications and other resources.

Between FY1999–2000 and April 2007, the institute awarded CAN\$135 million. During FY2006–2007, it awarded CAN\$24.2 million to 371 projects. The institute's funding opportunities announced during 2006 included fellowship awards, grants for pandemic flu preparedness, partnerships for health

system improvement, knowledge translation, access to care, and the development of wait-time benchmarks.

Knowledge translation is another important function of the IHSPR. Knowledge translation is the exchange, synthesis, and application of knowledge within a complex set of interactions among researchers and users, which accelerates the capture of the benefits of research through improved health, more effective services and products, and a strengthened healthcare system. Knowledge translation is required as an integral part of all institute-funded initiatives. In addition, the institute supports knowledge translation through the journal *Healthcare Policy*, through the development of knowledge translation casebooks, and through other direct-funding programs.

Healthcare Policy is the first Canadian journal dealing with a wide range of policy-related health issues from a multidisciplinary perspective. The institute was instrumental in establishing the journal, in partnership with the Canadian Association for Health Services and Policy Research (CAHSPR). The journal is published quarterly and is available in electronic and print formats.

Casebooks are an approach to knowledge translation that showcases creative initiatives taken to share knowledge between researchers and decision makers. The first knowledge translation casebook developed by the institute was *Evidence in Action, Acting on Evidence*. This publication draws from the experiences of individuals, teams, and organizations from across Canada, and it describes a broad range of knowledge translation activities, including what worked, what did not work, and lessons learned. A second casebook titled *Moving Population and Public Health Knowledge Into Action: A Casebook of Knowledge Translation Stories* was developed in partnership with the Canadian Population Health Initiative. This casebook focuses on population and public health research. Topics include aboriginal health, child and youth health, women's health, occupational and workplace health, and infectious and chronic diseases.

The IHSPR has initiated special knowledge translation activities in recent years, including funding research syntheses, and contributing to the establishment of national benchmarks for wait times for selected healthcare services. Research

synthesis is the process of using systematic methods to aggregate data from multiple studies on a particular topic. Syntheses can make an important contribution to the process that decision makers and healthcare administrators use when establishing policy. Syntheses translate a body of knowledge into information useable by those who can use it to inform their decisions.

The development of national benchmarks on wait times is an important contribution to the Canadian healthcare system. Within a single-payer healthcare system such as the one operating in Canada, it is necessary to have research evidence that identifies wait times that do not exceed lengths that have been shown to have negative effects on people's health. The institute has funded research teams to contribute to developing this evidence that was subsequently used as part of the process of developing national benchmarks. The institute-funded research on wait times continues.

Organization

As part of the CIHR, the IHSPR is ultimately accountable to the Canadian parliament. A governing council is responsible for the management of the property, business, and affairs of all the institutes. Each of the institutes is led by a scientific director who has responsibility for building the institute and research capacity; establishing and nurturing partnerships; fostering networking, knowledge dissemination, and communications; and conducting research. An institute advisory board provides advice to each scientific director on strategic directions for the institute. This is a key link between institute and stakeholder communities and is a source of broad community engagement.

Gregory S. Finlayson

See also Access to Healthcare; Benchmarking; Canadian Association for Health Services and Policy Research (CAHSPR); Canadian Health Services Research Foundation (CHSRF); Health Services Research in Canada

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- Canadian Institutes of Health Research (CIHR): <http://www.cihr-irsc.gc.ca>

CANCER CARE

Cancer care involves an entire team of medical specialists who care for patients with this chronic condition. Although the diagnosis of cancer generally begins with an oncologist or other physician, a healthcare team comprising nutritionists, social workers, and even pastoral counselors may work with the patient. Depending on the stage and type of cancer, a patient may undergo surgery, chemotherapy, radiation therapy, or immunotherapy. Additionally, patients may seek out complementary and alternative treatments, such as nutritional therapy, that may be essential to healing and transforming cancer patients into cancer survivors.

Each of the various cancer treatments can affect recovery in a different way. Cancer and its associated therapies can often cause nutrition-related side effects, which may impede the recovery of patients. Furthermore, because cancer treatments can interfere with a patient's appetite, taste, sense

of smell, and his or her ability to consume enough food, this may result in various side effects. Cancer patients may also be confronted with emotional problems, such as giving up hope that they will survive treatment. Therefore, trained social workers and pastoral counselors, working together with the oncologist and nutritionist, can help patients during this difficult time. Getting patients to focus on recovery and convincing them to consume the right kinds of food during and after treatment helps them stay strong.

Diet and Nutrition Therapy

Research has shown that cancerous tumors may produce chemicals that change the way the body uses nutrients. The human body's use of proteins, carbohydrates, and fats may be affected, especially by stomach and intestinal tumors. To ensure proper nutrition, a cancer patient has to consume enough foods that contain the essential nutrients of vitamins, minerals, protein, and carbohydrates. Malnutrition can cause cancer patients to be weak, tired, and unable to resist infections or withstand needed cancer therapies. Not consuming enough protein and calories is a common nutrition problem faced by many cancer patients as these are important for healing, fighting infection, and providing enough energy for daily activities. Sometimes a patient may appear to be eating enough, but the body may not be able to absorb all the nutrients. Thus, diets high in protein and calories can help prevent the onset of cachexia, a disease common among cancer patients who appear to be physically wasting away.

Nutrition therapy can help maintain body weight and strength, prevent body tissue from breaking down, rebuild tissue, and fight infection. Nutritional guidelines for cancer patients can be very different from the usual suggestions for healthful eating. People who eat as suggested during cancer treatment may be able to handle higher dosages of certain anticancer treatments.

Another treatment that may help relieve cancer symptoms and side effects that cause weight loss is through natural drug supplements. These are natural drugs that can relieve the symptoms of nausea, vomiting, diarrhea, and constipation and increase the production of pancreatic enzymes.

Surgery

More than half of all patients who have cancer, including head, neck, stomach, and intestinal cancer, elect to have surgery. The surgical procedure may involve the removal of all or part of the affected organ. Surgery increases the body's need for nutrients and energy to heal the wounds. This can also result in complications that affect a patient's ability to eat and metabolize food.

Surgery to the neck and head often cause chewing and swallowing problems. In addition, stress due to the amount of tissue removed during surgery may also affect the appetite. Surgery for cancer in the digestive tract may reduce the ability of the gastrointestinal system to work properly and may inhibit the digestion of food. Furthermore, removal of a part of the stomach may cause the feeling of fullness for the patient before enough food has been eaten. Stomach surgery can also cause dumping syndrome or the emptying of the stomach into the intestines before food is digested. Because the organs of the digestive system normally produce important chemicals and hormones, which are needed for digestion, surgery on these organs may affect the body's ability to absorb nutrients and vitamins. Additionally, levels of sugar, salt, and fluids in the body may become unbalanced.

Nutrition therapy may be able to treat these complications and allow cancer patients receive the nutrients they need. Some of the nutrition therapy for cancer surgery patients may include enteral nutrition or feeding liquid through a tube into the stomach or intestine; parenteral nutrition or feeding through a catheter into a vein; medicines to increase appetite; and nutritional supplement drinks.

It is common for patients to experience pain, tiredness, and loss of appetite after surgery. Some patients may not be able to consume their regular diet because of these symptoms. Thus, the following eating tips are commonly recommended by physicians: (a) Avoid carbonated drinks—such as soda pop—and gas-producing foods, including beans, peas, broccoli, cabbage, Brussels sprouts, green peppers, radishes, and cucumber; (b) increase fiber by small amounts and drink lots of water, if regularity is a problem, and good sources of fiber include whole-grain cereals—including

oatmeal and bran—beans, vegetables, fruit, and whole-grain breads; (c) select high-protein and high-calorie foods to help surgical wounds heal—excellent food choices include eggs, cheese, whole milk, ice cream, nuts, peanut butter, meat, poultry, and fish; and (d) increase calories by frying foods and using gravies, mayonnaise, and salad dressings.

Chemotherapy

Chemotherapy is a cancer treatment that uses drugs to stop the proliferation of cancer cells, either by killing the cells outright or by stopping those cells from dividing. Because chemotherapy targets rapidly dividing cells, healthy cells that usually grow and divide rapidly may also be affected by the cancer treatments. These include cells in the mouth as well as in the digestive tract.

There are a number of nutrition-related side effects that often occur during chemotherapy that affect a person's ability to eat and digest food properly. Some of the most common side effects include anorexia, nausea, vomiting, diarrhea, constipation, inflammation, and infections.

The side effects of chemotherapy may also make it difficult for a patient to obtain the nutrients needed to regain healthy blood cell counts between successive chemotherapy treatments. Thus, nutrition therapy can help patients get the appropriate nutrients to tolerate and recover from chemotherapy as well as prevent weight loss and maintain overall general health. Nutrition therapy for patients undergoing chemotherapy may include supplements high in calories and protein and enteral nutrition or tube feedings.

Radiation Therapy

Radiation therapy is a cancer treatment that uses high-energy X rays and other forms of radiation to kill cancerous cells. There are two basic types of radiation therapy: external radiation therapy, which uses a machine outside the body to send radiation to the cancer, and internal radiation therapy, which uses a radioactive substance sealed in needles, seeds, wires, or catheters that are placed directly into or near the cancer site. Radiation therapy can often harm healthy cells in the treatment area. Side effects can occur when

healthy cells that are near the cancerous cells are affected by the radiation treatments. These side effects depend mostly on the dose of radiation and the part of the body that is treated.

Radiation therapy that is performed near the digestive tract is likely to cause nutrition-related side effects. Radiation therapy to the head and neck may cause anorexia, taste changes, dry mouth, inflammation of the mouth and gums, swallowing problems, jaw spasms, cavities, or infection, while radiation therapy to the chest may cause swallowing problems, esophageal reflux or a backward flow to the stomach. In addition, radiation therapy to the pelvis or abdomen may cause diarrhea, nausea and vomiting, inflammation of the rectum or intestine, and fistula in the stomach or intestines. Some long-term effects can include narrowing of the intestine and poor absorption or blockage in the stomach or intestine. Radiation therapy may also cause exhaustion, which can lead to a decrease in appetite and a reduced desire to eat.

Nutrition therapy may be able to treat some of these side effects associated with radiation therapy, and it can provide the patient with enough calories and protein to tolerate the treatment, prevent weight loss, and maintain general health. The therapeutic regimen may include nutritional supplement drinks between meals, tube feedings, or other changes, including eating small meals throughout the day and choosing certain kinds of food.

Immunotherapy

Immunotherapy or biological therapy is a form of cancer treatment that uses a patient's own immune system to fight cancer. Substances that are made by the body or made in a laboratory can be used to boost or restore the body's natural defenses against cancer. Some of the most common side effects associated with immunotherapy include fever, nausea, vomiting, diarrhea, anorexia, and exhaustion.

Nutrition therapy can be used to treat the nutrition-related side effects of immunotherapy. If these side effects are not addressed, weight loss and malnutrition may occur and lead to complications during recovery, such as poor healing or infection.

Psychosocial Interventions

There are also psychosocial interventions available for cancer care, such as counseling, that are a part of the offerings at major hospitals. These interventions may include education, behavioral training, individual psychotherapy, and group interventions.

According to researchers at the University of California at Los Angeles School of Medicine, there is a need for a wide variety of psychosocial interventions for cancer patients as these types of interventions positively affect the survival of cancer patients. Furthermore, the need for a variety of psychosocial interventions is enhanced, as increasing numbers of patients with cancer survive longer.

Excellent communications skills in the oncologist can also help patients understand that complementary therapies are available to them. A study reported that communication within the field of oncology is a core clinical skill but one in which few oncologists or cancer nurse specialists have received much formal training. Additionally, communication difficulties may interfere with the recruitment of patients into clinical trials, which may result in delaying the introduction of efficacious new treatments. Oncologists have acknowledged that insufficient training in communication and management skills is a major factor contributing to their own stress, lack of job satisfaction, and emotional burnout. As a result, there have been various initiatives targeted at improving basic communication skills and training for healthcare professionals in the cancer field.

Researchers have also noted that there is a growing acknowledgment about the role that faith plays in patients seeking out cancer therapy as well as in healing. Thus, many cancer hospitals have increased the role of chaplains and pastoral care personnel in cancer care units. One study noted that decisions regarding cancer treatment choices can be difficult and that many factors may influence the patient's decision to undergo treatment. A poorly understood factor is the role of a patient's faith in how he or she makes medical decisions. In this study, researchers interviewed more than 100 patients with advanced lung cancer, their caregivers, and 257 medical oncologists. The study participants were asked to rank the importance of their cancer physician's recommendation, faith in

God, ability of the treatment to cure disease, side effects, family physician's recommendation, spouse's recommendation, and children's recommendation as factors that might influence their treatment decisions. The findings revealed that all three groups ranked the oncologist's recommendation as the most important, and patients and caregivers ranked their faith in God second. The researchers concluded that patients and caregivers agree on the factors that are important in deciding treatment for advanced lung cancer; however, their decision differed from physicians. All the groups agreed that the oncologist's recommendation was the most important. The results indicated that this was the first study to demonstrate that faith is an important factor in medical decision making.

Another study also found a positive role for religious faith in cancer care for breast cancer patients. The study identified and examined the religious and spiritual coping strategies of elderly women newly diagnosed with breast cancer. For this study, 33 women, aged 65 and older, of various religious denominations were recruited, within 6 months of diagnosis. The findings from this study showed that religious faith either stayed the same or increased during the cancer crisis. Three themes also emerged from the analysis: Religious faith provided the respondents with the emotional support necessary to cope with breast cancer; faith communities provided social support for patients; and faith provided patients with the ability to make sense of their lives during cancer.

In another study, it was found that cancer patients have a range of psychosocial needs that require particular support interventions. Although patients may have strong needs that relate to identity, emotional, spiritual, and practical issues, they are less commonly expressed. Furthermore, patients may have particular needs based on their tumor type, severity of illness, age, gender, health status, and socioeconomic and other social factors.

Many cancer treatment centers seek to provide patients with the necessary tools to cope with their illness when treating their patients. One center, for example, offers daily spiritual gatherings for cancer patients and holds classes in praying the rosary for Roman Catholic, Orthodox, and Anglican patients, as well as Bible study for evangelical Protestants. Even patients who do not come from a strong religious background are encouraged to

connect with their spiritual side by the mind-body therapies there during the cancer care treatment. Patients can be instructed in spiritual practices such as yoga, Tai Chi, or other techniques from the Far East that can be used to concentrate the mind and body and help facilitate the healing process from cancer therapy.

Future Implications

With the aging of the nation's population, the number and rate of cancer patients will continue to increase. To meet their needs, cancer care will involve many different facets in the healing process, including traditional as well as complementary and alternative treatments. A medical team must work in synchrony to effectively care for cancer patients. Additionally, oncologists and other healthcare team members must be cognizant and attentive to cancer patients' unique needs to better facilitate cancer care and achieve the best possible outcome.

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See also Acute and Chronic Diseases; Chronic Care Model; Complementary and Alternative Medicine; Mortality, Major Causes in the United States; Quality of Healthcare; Quality of Life, Health-Related; Randomized Controlled Trials (RCTs)

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National Cancer Institute (NCI): <http://www.cancer.gov>

National Comprehensive Cancer Network (NCCN):
<http://www.nccn.org>

CAPITATION

Capitation is the prepayment for patient health-care services. Generally, capitation payments are based on a per-member per-month (PMPM) basis. While all types of physicians can be compensated on a capitated basis, primary-care physicians in family practice, internal medicine, and pediatrics are often paid on a capitated basis. The capitation rate includes services provided by the physicians, and it usually also includes diagnostic tests performed in their offices. The capitation rates vary with the age and gender of the patients. For example, the capitation rate for a child under 1 year of age is higher than the rate for a 2- to 5-year-old child because the number of physician visits is expected to be greater. Similarly, the capitation rates for women between the ages of 18 and 40 are higher because the utilization of services is expected to increase due to their child-bearing years.

Overview

Capitation in the United States is often associated with managed-care organizations; however, the concept dates as far back as the Middle Ages.

It is recorded that under the rule of Henry I of England and Normandy that John of Essex received an honorarium of 1 penny per day for serving in a physician's role, a sum equal to that paid for a foot soldier or blind person of the time.

Some early American physicians were also paid on a capitated basis. The author Samuel Clemens, better known as Mark Twain, noted that while he was growing up in Hannibal, Missouri, his parents paid a local physician \$25 annually to care for his family when they were ill.

At the height of the managed-care movement, in the 1980s and 1990s, many physicians were paid a lump sum each month to deliver primary and/or specialty services for patients. Patients were required through insurance arrangements to designate a primary-care physician through whom all their primary services would be provided. The physician then would have a panel of patients they could see on a walk-in or appointment basis. Primary care, internal medicine, and pediatrics were the clinical areas that were customarily designated for capitation payment.

In the late 1990s, physician capitation expanded from individual physicians to encompass physician group practices. Insurers used enhanced capitation schedules to recruit large physician networks and then introduced the global capitation philosophy, which incorporated multiple primary physicians and ancillary services. As the capitation phenomenon grew, some practices realized that they were poorly managing the PMPM rate that they were being paid. Patients started demanding more services, and the physicians were demanding enhanced payment. Thus, insurers introduced enhanced quality payments and bonus payments for meeting performance standards.

The clinical changes in the specialties of cardiology and orthopedics that incorporated diagnostic and technological advancements were revolutionizing those disciplines. As a result, insurance companies wanted to expand capitation payment into those clinical specialties; however, this did not catch on as a payment method. Incorporating the broad array of procedures and equipment into specialty capitation transferred too much risk to the physician. Providers who tried to manage patients under a capitation arrangement found it difficult to meet their financial expectations.

Calculation of Capitation

Every physician office has a bill collection and utilization profile. An insurance or managed-care company will use an actuary to develop a profile of the physician. For example, the average primary-care physician may charge \$100 per visit. Based on the age of the patient, the physician may expect to see the patient 2.5 times a year. Therefore, in a year, the billed rate would be $\$100 \times 2.5 \text{ visits} = \$250/12 \text{ months per year} = \20.83 per member per month. For every patient with the same gender and age, the physician would receive \$20.83 per month. Although this amount is high, it can be used for illustration purposes. Moreover, the case-mix of the patients in an office may affect the physician compensation. For example, a physician with a large HIV/AIDS patient population may receive a higher capitation rate because of the complexity of the care the patients need to receive. In other cases, the location of the physician's office may also affect the capitation rate because the cost of living in certain areas may dictate a higher capitation rate. A particular primary-care specialty may also dictate that a physician be paid more than another such as in the case of an internist being paid more than a family practitioner.

Advantages and Disadvantages of Capitation

The advantage of capitation for the physician is that he or she can negotiate a contractual relationship with an insurance company for a payment. Through the insurance company relationship, the insurer will have members who require a physician relationship. The patient-member is required to designate a primary-care physician who is responsible for his or her care. The patient can then presumably visit the physician on an unlimited basis under the capitation arrangement. In this example, the physician assumes the risk of managing the patients in a manner that allows his or her practice to make a profit.

The advantage of capitation for an insurer is that there is predictable budgeting and the delegation of medical management to the provider. For the provider's part, there is also a predictable income and steady payment on a biweekly or monthly basis from the insurer. For the patient, the

advantage is that there is a relationship with a primary-care physician and minimal out-of-pocket expenditure for services.

In terms of disadvantages, physicians may assume too much risk by having many capitated patients who are severely ill and need medical services. Furthermore, some payers, particularly Medicaid, may not adequately pay, or not pay in a timely manner, for their capitated patients.

Future Implications

Today, capitation remains an important physician payment method, especially in areas dominated by managed-care organizations. This is the case in some of the western parts of the nation, where large health maintenance organizations (HMOs) are the dominant providers of care. However, for the most part, capitation is no longer the preferred payment source of physicians because many prefer to unbundle their services and be paid on a fee schedule. This may change as healthcare expenditures continue to increase and federal and state governments along with employers move to reduce costs through the capitated model of care.

Diane M. Howard

See also Cost of Healthcare; Employee Health Benefits; Fee-for-Service; Health Insurance; Health Maintenance Organizations (HMOs); Managed Care; Payment Mechanisms; Physicians

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America's Health Insurance Plans (AHIP):

<http://www.ahip.org>

American College of Physicians (ACP):

<http://www.acponline.org>

Employee Benefit Research Institute (EBRI):

<http://www.ebri.org>

CARVE-OUTS

The term *carve-outs* in the health insurance industry relates to the unique healthcare services that are removed or carved out from a given set of insurance benefits. The carved-out services are provided by a separate vendor or company that offers expertise to a given membership base, and provision of these services involves a contract that is separate from any made with a managed-care organization. The concept of carve-outs was popularized in the late 1980s, when managed care accelerated in the United States due to rising healthcare costs. Carve-outs have advantages as well as disadvantages for healthcare providers and consumers.

Overview

Carve-outs represent a model of contracting for specialty care with providers as a way of controlling rising healthcare costs. Carve-out contracts can include care for patients with certain conditions, particular services, or care for an entire subpopulation of patients. Carve-outs are distinct because they involve a set of providers or management organizations different from those that are otherwise available for patients within a health plan. They permit a unique set of managed-care techniques to be applied to an area of care that is costly or involves complex benefits. Carve-out arrangements can occur at different levels of the healthcare system, including the payer, health plans, or group practices to manage a portion of the insurance risk. Carve-outs appear to lower the associated costs of healthcare for employers and health plans, although whether or not they improve patient outcomes is unclear. In addition, carve-outs may change the competition dynamics among health plans.

In the 1980s, insurance companies developed large utilization review programs with elaborate referral systems that quickly frustrated enrollees and primary-care physicians because of the paperwork involved in getting a referral. Behavioral health, dental care, and worker's compensation services were unique and required specialized oversight. For the most part, the staffs employed by the insurance companies had general medical/surgical backgrounds, and therefore they found it difficult to approve specialty referrals to services for which they had limited formal training. In response to these knowledge gaps, insurance and managed-care companies recruited nurses and physicians who had expertise in behavioral health, dental care, and worker's compensation to fill this void and develop carve-outs.

Advantages and Disadvantages of Carve-Outs

The intent of carve-outs is to deliver efficient and cost-effective services by a central source that has expertise in a particular service. Some examples of carve-outs include dental care, mental health, workers compensation, and pharmacy benefits. The advantages of carve-outs include the following: economies of specialization, enhancement in access to care, the knowledge and expertise that comes with specialization, better coordinating of services with medical and surgical services, control of utilization, and using market power to affect quality. In contrast, the disadvantages of carve-outs include the lack of coordination between various providers and the time needed to perform the coordination. Oftentimes, patients are caught in the middle, and they do not have anyone to serve as their advocate. In some cases, companies have in-sourced their carve-outs to limit the confusion. Some of the coordination difficulties have occurred prominently in the mental health area.

Carve-Out Examples

The number of specialty service companies in dental care, mental health, workers' compensation, and pharmacy benefits has greatly increased. For example, several states have developed contractual relationships with trade unions for carve-out dental services.

Behavioral or mental health services are another example of frequent carve-outs. The types of services under the behavioral health umbrella include the following: hospital inpatient services, residential treatment, partial hospitalization, intensive outpatient programs, outpatient treatment, and employment assistance programs. In the early 1990s, many state governments were trying to move their Medicaid recipients into more cost-efficient services. State governments anticipated that they could take advantage of the cost savings offered in managed care, and they began to promote Medicaid managed-care programs; Medicaid recipients were moved into plans with defined benefits with an associated per-member per-month (PMPM) rate. Often, the state's Medicaid recipients were given a choice of two managed-care programs to join. The very nature of Medicaid recipients with their socioeconomic problems and their associated mental health issues moved states to carve out mental health services from medical and surgical services.

Many state workers' compensation programs were established in the United States at the beginning of the 20th century. These programs provide medical care and disability income to workers who are injured in the course of their employment. Under the programs, the injured worker is prohibited from bringing a lawsuit against the employer, and the employer is obligated to pay the mandated benefits. Since workers' compensation programs are mandated by the states, the programs are funded primarily through private insurance companies, state funds, or self-insurance provided by employers. Employers that want to protect themselves from the specialized legal and regulatory nature of the workers' compensation program often carve out these services to companies with this clinical and legal expertise.

Pharmacy benefits have also been carved out to pharmacy benefit managers (PBMs). Pharmacy benefits are currently the third largest healthcare benefit expenditure of insurance plans after hospital and outpatient medical benefits. The percentage increase in pharmacy benefits has increased to the double digits to 10.1% of healthcare expenditures in 2006. And because of the aging and increasing longevity of the nation's population, pharmacy services will likely continue increasing in the near and distant future.

Future Implications

The future of carve-outs is unclear. The U.S. healthcare system is dynamic, and the nature of services will continue to change as economic incentives shift. There are many opportunities to change the nation's healthcare system so that it meets better the expectations of federal and state governments, employers, insurers, and individuals. As long as carve-outs add efficiencies, limit healthcare expenditures, offer enhanced access to services, and coordinate care, they will likely continue to play a role in the nation's healthcare system.

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See also Acute and Chronic Diseases; Competition in Healthcare; Cost of Healthcare; Disease Management; Health Insurance; Health Maintenance Organizations (HMOs); Managed Care; Mental Health

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Web Sites

- America's Health Insurance Plans (AHIP):
<http://www.hiaa.org>
- Employee Benefit Research Institute (EBRI):
<http://www.ebri.org>

CASE MANAGEMENT

Case management is a clinical tool that is used to increase the efficiency and effectiveness of

client health and social services and control costs at the same time. The Case Management Society of America (CMSA) defines *case management* as a collaborative approach to assess, plan, facilitate, and advocate for services that meet the health needs of individuals and to increase the quality and cost-effectiveness of client outcomes. More generally, case management helps coordinate resources and services; advocates for client's/patient's rights; monitors and manages clients/patients throughout episodes of illness across all care settings and systems; and addresses clients'/patients' physical, emotional, social, mental, and economic needs.

Case managers often help clients navigate between the different stages of care and providers as well as to help facilitate payment by private or government payers. The broad goals of case management seeks to prevent rehospitalization, prevent inappropriate hospital emergency department use, and reduce the number of lost days of work the client experiences to arrange for care. Case management also acknowledges the role of other systems, such as the labor, financial, and legal systems, in implementing healthcare.

Overview

Case management has its origins in the community mental health movement following the deinstitutionalization of the mentally ill that began in the 1950s. Client-centered community support systems for the deinstitutionalized mentally ill were created under the Community Support Program at the National Institute of Mental Health (NIMH). Due to the lack of sufficient public funding for care, individual case managers, who were mostly in the field of social work, assumed the responsibility for linking mentally ill clients to needed community mental health services and support. The case manager identified the resources and support systems in the communities, provided counseling, and assisted with the tasks of daily living while providing linkages to needed services. The private-sector interest in case management grew following World War II as a method to control the healthcare costs of returning veterans with complicated injuries who needed treatment from multiple providers. The foundation for

the modern case management model was established in the 1970s through the Medicare and Medicaid programs, which used social workers as caseworkers to facilitate care provided by multiple health and social service providers for identified special-needs populations, such as the elderly and those with mental illness.

As the healthcare system and the management of disease and disability have grown increasingly complex and fragmented, the need for case management has increased substantially. The application of case management, however, varies based on three criteria—the profession of the individual providing the case management services (i.e., registered nurse or social worker), the population receiving the services (i.e., the elderly or individuals with mental illness), and the type of organization providing the case management (i.e., hospital or insurance company).

A social service/public health model focuses on patient advocacy and access to services in a fragmented healthcare system. The case management model that has emerged from the managed-care sector, however, has been motivated by cost containment and encourages the utilization of cost-effective community care.

In the current environment of escalating healthcare costs, case management has become a popular method to control costs and eliminate the duplication of services and prioritize less costly services that may be equally effective. The managed-care model of case management that has been increasingly used, however, is primarily driven by cost containment as opposed to the client-centered approach of the public health model. As a result, appropriate care may be compromised by denying treatments that may be clinically necessary or by discharging patients earlier than recommended.

Case management can be of great value when dealing with the complex needs of clients who have multiple health and social issues, such as individuals with mental illness, HIV/AIDS, or substance abuse problems. Case managers typically use a client-centered approach to assess clients in a holistic manner, prioritize and advocate for their needs, and navigate them through the continuum of care.

Case managers can be internal to an organization by working within a program or facility.

On the other hand, external or independent case managers are often employed by insurance companies and are hired to provide case management services. External case managers try to facilitate coordination of care among various providers, programs, systems, and facilities.

Although case management may be implemented differently across various settings, the five common goals of case management are (1) enhancing continuity of care; (2) providing access to cross-sectional service delivery that is comprehensive, coordinated, and ongoing; (3) enhancing accessibility by overcoming administrative barriers; (4) enhancing accountability by designating a case manager as the point of contact for the responsibility of ensuring the effectiveness of the system; and (5) enhancing efficiency by increasing the likelihood of clients receiving timely delivery of appropriate services. Some of the key functions of case management include assessment, planning, linking, monitoring, and advocacy. Outreach is also sometimes identified as another function of case management.

Case management is also a key component of systems of care. When case management is a part of the system of care, it has the fiscal authority to procure needed services for clients. For example, a community agency can develop a memorandum of understanding with other agencies to provide care to their clients. This approach helps enhance a seamless continuity of services. Systems of care can be located in a single multiservice center acting as a one-stop shop for clients. On the other hand, the systems of care can use a saturation approach, mobilizing the entire spectrum of services from medical to social services, and financial and legal services. Additionally, treatment services, rehabilitation, housing, employment, and other supports can be included.

Case Management Settings and Service Delivery

Case management has been used across a variety of settings to improve service provision, service coordination, and health outcomes. Some of the individual needs that case managers address include healthcare and social issues, acute and chronic illnesses, substance abuse, homelessness, mental illness, domestic violence, and long-term

care. Hospitals often treat patients with complicated healthcare needs and therefore use case managers to help facilitate access to and coordination of services to ensure a smooth transition across the continuum of care. Case management is also used in long-term care to help clients attain needed services such as rehabilitation, nursing home facility placement, and home health care.

In addition, the context of service delivery must be taken into account when considering the range of services provided under case management. To receive and effectively use healthcare services, the client who is living in the community will need stable and safe housing, adequate nutritional intake, and a source of income or financial assistance. The client is involved in the process of service linkages; his or her background and preferences are taken into account when identifying a service delivery system, including ethnic group affiliation, cultural practices, language, and neighborhood.

Models of Case Management

Numerous models of case management exist; however, they can generally be categorized into four groups: the broker model, the rehabilitation model, the full support model, and the strengths model. The broker case management model is the least intensive and case managers in this model generally have high caseloads. Under the broker model, the case manager links the client with a service provider. The rehabilitation and full support models, however, are more intensive. Under these models, case managers identify the client's strengths and weaknesses and work to address the barriers that prevent them from functioning independently in the community. The full support model also includes an in-house team of service providers to treat clients who have complex and long-term needs. Last, the strengths model focuses entirely on the client's strengths. The case manager works with the client to develop client-centered goals and relies heavily on the client-case manager relationship. This model requires thorough outreach and follow-up services.

Case management is used mostly on a short-term basis for hospital discharge planning, rehabilitation, or end-of-life planning. Longer-term case management may be used for chronic or

complex diseases such as cancer, diabetes, and asthma. Case management has also been used in communities to coordinate care for low-income pregnant women to reduce low-birth-weight or premature babies to reduce infant mortality. Clients who use case management may also include the mentally ill, children with mental health and behavior problems, the elderly, and those with developmental or physical disabilities.

Case managers generally receive referrals from client identification and outreach in the medical community; case managers may also identify clients through their outreach. Case managers develop a therapeutic relationship with their clients to help facilitate care. After client identification, case managers assess the clients' needs for obtaining care. The case manager identifies those barriers that the client confronts in accessing, obtaining, and receiving needed healthcare services. This may include identifying the financing for care, locating transportation to care, and identifying the appropriate treatment and geographic location for that treatment. The case manager facilitates the timely treatment and receipt of services by linking the client with the service provider. Monitoring is a core component of case management since clients' needs change over time, especially with complex and multiple disabilities or medical problems. Case management is particularly important when medical services are difficult to understand or when navigating healthcare services is uncoordinated. If a client needs ongoing healthcare services over time and continuity of care is critical, case managers can link and monitor service use. Case management is also helpful when a patient has multiple comorbidities and has a need for multiple services. The case manager coordinates care when there is a need for attention to provide multiple services at any one point in time.

The case manager functions as the patient's navigator, and the caseload can vary, depending on the client's severity of need, type of medical care needed, and the duration of medical service utilization. The case manager is typically a social worker, registered nurse, or paraprofessional. The training and supervision of case managers includes training in service coordination and service evaluation. With the increased use of case management by insurance companies, professionals in various disciplines have also started to use

case management with increasing frequency, including rehabilitation counselors and occupational therapists.

Effectiveness of Case Management

The effectiveness of case management has been seriously debated, and there are no clear answers. Although some studies have found case management to be not effective in attaining improved patient health status and cost-effective outcomes, other studies have found the opposite result. Because case management is integrated with other client support services in various settings and has broad goals, this concept is very difficult to evaluate and measure. The effectiveness of a program depends on a variety of factors, including the program design, how well it was implemented, and how well it conforms to evidence-based practices. Measuring the effectiveness of case management interventions can prove challenging. However, researchers can use scales, client interviews, and questionnaires to gain further insight.

Future Implications

Case management could potentially have an impact on reducing the costs for healthcare services. Nonetheless, health services research on case management has to include the variations in case management models. Investigators, therefore, continue to explore the outcomes in access to services, systems performance, cost-effectiveness, and service patterns. Although some studies point out that case management has been ineffective in meeting its intended goals of coordinating patient care and reducing costs, other research studies have pointed out that it can increase access to care and subsequently improve health outcomes. When patients are provided with case management, there is a decreased chance of duplicating unnecessary medical services and an increased chance of providing appropriate and necessary care. Case management remains a promising tool to help certain populations obtain needed and essential social and health services. It is likely that case management will continue to be used by hospitals, insurance companies, and others to control rising healthcare expenditures and adequately manage

the health of special-needs populations and the chronically ill.

Sharon Telleen

See also Acute and Chronic Diseases; Continuum of Care; Cost Containment Strategies; Disease Management; Managed Care; Medicaid; Patient-Centered Care; Primary-Care Case Management (PCCM)

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- National Association of Social Workers (NASW):
<http://www.socialworkers.org>

CASE-MIX ADJUSTMENT

A variety of situations in health services research demand the use of some type of case-mix or acuity adjustment, that is, adjustment made on the basis

of the characteristics of those receiving services. Case-mix adjustment is crucial in reimbursement for health services, especially in any prospective reimbursement model. For example, the services needed by an 80-year-old diabetic with arteriosclerotic heart disease who is admitted to a hospital for an acute exacerbation of congestive heart failure will differ dramatically from those required by a 25-year-old athlete admitted for repair of a torn knee ligament. Equitable and effective reimbursement models must take such differences into account. The first widely used case-mix adjustment system was the Diagnosis Related Groups (DRGs) used by Medicare since 1983, which paid a specific amount for acute care depending on a hospital patient's discharge diagnosis, gender, age, procedures, and comorbidities.

Any attempt to analyze individual health outcomes also requires researchers to include in their models those individual characteristics that affect a patient's likelihood of a better or worse outcome. The likelihood of in-hospital mortality will differ dramatically between a patient who has fallen and sustained a serious closed head trauma and a similar patient whose fall resulted in a hip fracture. These types of adjustments are also necessary when one analyzes some measures of process quality. The presence or absence of specific care practices may depend on the severity of one's illness.

Finally, case-mix adjustment is crucial when one attempts to measure provider performance, either for quality assurance or some pay-for-performance model. Mortality rates in tertiary care hospitals may be higher than mortality rates in community hospitals due to the differing nature of their patient populations. Failing to adjust for those differences may significantly distort one's judgment concerning differences in the quality of care provided by those two types of acute care settings.

Nursing Home Example

The Medicare resource utilization group (RUG) models used in nursing homes are examples of case-mix classification systems used for reimbursement. The steps in the development of the RUG models are the same as those that might be used in any healthcare setting. First, a sample of

nursing homes (i.e., healthcare providers) is selected for participation in the development of the classification model. The sample must meet minimum quality criteria. Second, researchers conduct a time study in the chosen nursing homes, in which each staff member or caregiver records how they spend all their time over a 1- to 3-day period. The care time provided by each type of staff member (e.g., registered nurse, nurse aide) will eventually be weighted by his or her relative salary level. Third, at roughly the same time, each resident in the selected nursing homes is assessed using a multidimensional assessment tool that evaluates his or her need for care. Fourth, statistical analyses are performed on the data concerning roughly half to two thirds of the residents. These analyses result in the identification of groups of residents who received roughly the same amount of wage-weighted care time and had relatively similar health problems or levels of impairment. The degree to which these groups explain the statistical variation in weighted care time is an important criterion for choosing among potential classification models. In nursing homes, for example, these models usually explained between 50% and 70% of the statistical variance in weighted care time. Fifth, the chosen patient classification model is validated on data from the remaining residents. Sixth, one group of residents is chosen to serve as the index group and given a case-mix index of 1.0. Every other group of residents is assigned a case-mix index that reflects the relative average weighted care time provided to that group compared with the average weighted care time provided to the index group. Seventh, in some instances (RUG-III), case-mix indexes are adjusted, based on clinical judgments. Finally, the case-mix index for the group into which a patient falls can then be used to adjust all, or a portion of, the payment for that provider's services to that patient.

Common Criticisms

One of the most common criticisms of all case-mix classification systems comes from healthcare providers. Some providers invariably believe that these models fail to capture the true level of need exhibited by their clients, patients, or residents. This means, of course, that these providers see themselves

as not receiving appropriate reimbursement for the care they give. The implementation of these models creates both winners and losers in terms of reimbursement levels. For this reason, the models are often implemented in a "soft" manner with wide corridors around presumptive reimbursement levels for nursing homes. Over time, however, these corridors narrow as the providers adjust to this new reimbursement model.

Among advocates and academics, the most common criticism is that these models only replicate the care provided. Case-mix classification models do not identify ideal patterns of care or recognize and reimburse best practices. The resource use estimates that form the core of these models, whether they are weighted hours of care in a nursing home or days of care in a hospital, rest on current care patterns. These patterns can be excellent, adequate, or inadequate. Those involved in nursing home resident classification have a standard response to this argument. They believe that the relative differences reflected by case-mix indexes reflect real differences among residents. They admit, however, that the specific hours of care provided to the index group may not be ideal. As reassuring as this argument seems, it currently lacks a strong base of empirical evidence.

Also, for long-term care, such models pay a provider more if it allows someone to decline or become more seriously ill. In essence, these models can arguably be said to offer incentives exactly the opposite of pay-for-performance models. Professional ethics, state inspections, the availability of ombudsmen and consumer advocates, and reports to consumers of provider performance would all seem to counterbalance such perverse financial incentives. At times, it seems that these "counterincentives" may not function as well as one would hope. In acute care, one must only remember concerns about "quicker and sicker" hospital discharges as a result of the implementation of the Medicare DRG system to realize such concerns are unwarranted. In long-term care, one simply needs to remember the state residential care reimbursement model that paid for the care of residents in wheelchairs and those residential care homes that allegedly put all their residents in wheelchairs, needed or not, to maximize reimbursement.

In performance-measurement or consumer-reporting models, one of the most common

objectives of case-mix adjustments comes again from healthcare providers. Most provider organizations that find themselves identified as giving poorer care in a performance measurement or consumer reporting system argue that their performance is unfairly reflected in that system. They often blame any case-mix adjustment model for this error. If appropriate adjustments for the acuity or consumer needs were made, these providers argue, their organization would fare much better.

Case-Mix Adjustment in Various Settings

In adjusting quality measures, usually outcomes, acute care in many ways provides the simplest setting. The patient's stay is generally very short, the admission often involves a single presenting problem, and the patient's status at admission is clearly unrelated to the hospital's performance (assuming this is not a readmission). All these things make for somewhat less complicated risk adjustment. The nature of the primary complaint, the severity of that complaint, and the number and severity of comorbidities, along with the patient's demographic characteristics, constitute the basics for good risk, acuity, or case-mix adjustment in an acute care setting.

However, this same process is more complicated in other settings. In nursing homes, for example, the average length of stay for long-stay residents amounts to years, not days. Evaluating quality over such longer time periods when the residents are exposed to the nursing home's performance becomes difficult. A nursing home resident's health may decline between the 9th and 12th months of their stay. This decline will probably be reflected in the diminution in their ability to independently perform certain activities of daily living (ADLs). It is difficult to determine whether that decline was an unavoidable result of their disease burden or whether it might have been avoided if the nursing home had provided additional or different care in the first 9 months of their stay.

Attempting, under such circumstances, to determine how much of the change in outcomes can be attributed to the care provided by a nursing home and the "natural" process of decline is exceedingly difficult. The condition of the resident in that 12th month is inextricably intertwined with the quality

of care provided by that nursing home during the first 9 months of his or her stay. Thus, the idea of adjusting for "baseline status" unrelated to the provider's performance (as in hospitals) is quite difficult to achieve. Surprisingly, however, this difficulty has not driven nursing home researchers to move more heavily toward the use of process quality measures that often require less acuity adjustment.

Future Implications

Across the entire spectrum of health services, the eventual success of the growing movement toward pay-for-performance will depend heavily on the quality of the case-mix adjustment used in these reimbursement models. Paying more to healthcare providers that perform better is an eminently reasonable idea. However, to the degree that indicators of clinical outcomes are used as part of such a process, it is important that one understands, for such indicators, just how much of the variation among providers is a function of random fluctuation, consumer characteristics, or provider action. In essence, when the variation in a quality indicator is broken down, a sizeable proportion of that variation should be attributable to provider performance. At this time, it is unclear how attentive those pursuing the development of pay-for-performance models are to this issue.

Charles D. Phillips

See also Diagnosis Related Groups (DRGs); Long-Term Care; Nursing Homes; Pay-for-Performance; Payment Mechanisms; Prospective Payment; Quality of Healthcare; Severity Adjustment

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InterRAI: <http://www.interrai.org>

Johns Hopkins University ACG Case-Mix System:
<http://www.acq.jhsph.edu>

National Association of Children’s Hospitals and Related Institutions (NACHI):
<http://www.childrenshospitals.net>

CATO INSTITUTE

The Cato Institute seeks to broaden the parameters of public policy debate—including debates over health and medicine—to allow consideration of the traditional American principles of limited government, individual liberty, free markets, and peace. Toward that goal, the Cato Institute strives to achieve greater involvement of the intelligent, concerned lay public in questions of policy and the proper role of government.

Background

The Cato Institute was founded in 1977 by Edward H. Crane. It is a nonprofit public policy research foundation headquartered in Washington, D.C. The institute is named for *Cato’s Letters*, a series of libertarian pamphlets that helped lay the philosophical foundation for the American Revolution.

To maintain its independence, the Cato Institute accepts no government funding. Cato receives approximately 75% of its funding from individuals, with smaller amounts coming from foundations, corporations, and the sale of publications. Cato’s 2005 revenues were more than \$22.4 million, and it has approximately 95 full-time employees, 70 adjunct scholars, and 20 fellows, plus interns.

Publications Program

The Cato Institute undertakes an extensive publications program dealing with the complete spectrum of public policy issues. Books, monographs, briefing papers, and shorter studies are commissioned to examine issues in nearly every corner of the public policy debate. Policy forums and book forums are held regularly, as are major policy conferences, which Cato hosts throughout the year and from which papers are published thrice yearly in the *Cato Journal*. All these events are recorded and archived on Cato’s Web site. Additionally, Cato has held major conferences in London, Moscow, Shanghai, and Mexico City. The institute also published the quarterly magazine, *Regulation*, and a bimonthly newsletter, *Cato Policy Report*. The institute recently launched the Cato@Liberty blog, where its scholars provide timely commentary on public affairs, and *Cato Unbound*, a monthly online magazine that engages the world’s leading thinkers in the exchange of big-picture ideas.

Health Policy Studies

Cato scholars argue that individuals should be free to own and control their earnings, to engage in whatever exchanges of health-related goods and services they choose, and to engage in whatever behaviors they choose—provided they respect the equal rights of others. Cato scholars maintain that in a free and open society, the government should play no special role in health or medicine: In the absence of violence, theft, tortious injury, fraud, or breach of contract, introducing the government’s power to coerce is unwarranted, immoral, and counterproductive.

For example, Cato scholars assert that federal and state governments deny individuals the freedom to choose whether to purchase health insurance and what type; deny the freedom to choose whether and how to provide charitable care; restrict patients’ ability to choose their course of medical treatment; restrict free entry into the medical professions; prohibit the sale of human organs; and refuse to honor contracts limiting providers’ liability for malpractice. These scholars argue that individuals have a fundamental right to self-determination in each of these areas, free from any coercive restraints.

Where advocates of government regulation of drugs and medical devices claim that such regulation protects the public from unsafe products, Cato scholars maintain that government has no constitutional or moral authority to prohibit a patient from using a medical treatment that imposes costs on no one but herself or himself. Moreover, the economic literature suggests that the U.S. Food and Drug Administration (FDA) causes more morbidity and mortality than it prevents.

Likewise, proponents of medical licensing, which restricts entry into the professions and dictates what services each profession may offer, claim that it enhances the quality of care. Cato scholars say that licensure denies patients the right to be treated by the practitioner of their choice; that low-quality care is widespread despite licensing; that licensing does not improve overall quality because it reduces access to care (primarily among the poor); and the chief proponents of licensing are incumbent practitioners who profit by restricting entry; and that licensing has enabled the medical profession to resist evidence-based efforts to improve quality such as electronic medical records. Cato scholars further argue that markets—backed up by the tort system—develop voluntary means of ensuring quality, such as hospital-admitting privileges and board certification.

Cato scholars argue that laws prohibiting the sale of human organs (to transplant patients or organ brokers) restrict the freedom of individuals to control their own bodies, cause an artificial shortage of transplantable organs that leads to thousands of unnecessary deaths each year, and ominously allow the government to assert a property right in the body of every citizen.

Cato scholars also object to the refusal of courts to uphold contracts limiting a provider's liability for malpractice in exchange for reduced-price or free medical care. Opponents of such contracts argue that patients harmed by negligent providers might not be able to recover. Cato scholars counter that such a rule limits the right of consenting adults to engage in mutually beneficial exchanges that harm no one else, reduces access to care among those least able to pay, and reduces experimentation with malpractice rules that ensure both quality and access.

Cato scholars argue that the government likely does the greatest damage in the area of financing medical care. Government programs such as Medicare and Medicaid finance nearly half of all medical expenditures in the United States, displace private markets, deny adults the freedom to choose how to fund their health needs in retirement and how to assist the needy, and waste scores of billions of dollars each year on services that make patients no healthier or happier. Cato scholars argue that targeted tax breaks, principally for employer-sponsored insurance, have much the same effects: They deny workers control over their earnings and health insurance decisions, encourage wasteful spending, strip workers of their coverage when they leave a job, and hamper the pursuit of high-quality, affordable healthcare.

Cato scholars seek to eliminate these restrictions on the freedom of individuals to control their earnings and on the decisions that affect their health. Moreover, Cato scholars reject government intervention to remedy private health problems, such as obesity, diabetes, or addiction.

Health Policy Impact

The Cato Institute has played an influential role in U.S. health policy for more than a decade. In 1992, the institute published the book *Patient Power: Solving America's Health Care Crisis*, which laid the intellectual foundation for the consumer-directed healthcare movement. Two years later, Cato published a companion book, titled *Patient Power: The Free-Enterprise Alternative to Clinton's Health Plan*, for a wider audience. The book made *medical savings accounts* a household term, helped defeat President Bill Clinton's Health Security Act, and set the stage for the creation of health savings accounts in 2003.

Cato scholars continue to advocate the restoration of liberties that have been eroded by political intervention in health and medicine.

Michael F. Cannon

See also American Medical Association (AMA); Consumer-Directed Health Plans (CDHPs); Credentialing; Public Policy; U.S. Food and Drug Administration (FDA)

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- Cato Institute: <http://www.cato.org>
 Cato@Liberty (blog): <http://www.cato-at-liberty.org>
Cato Unbound (monthly magazine):
<http://www.cato-unbound.org>

CAUSAL ANALYSIS

Does smoking cause lung cancer? It is hard to believe that this was once a question in some dispute. Yet despite the fact that there has been no randomized controlled trial (RCT) in which research subjects were randomly assigned to smoking or nonsmoking conditions with subsequent long-term follow-up to ascertain differences in health outcomes, there has long been a consensus that smoking does indeed cause lung cancer, although it is certainly not the only cause. However, although smoking-and-health is certainly not the only case where a consensus has been reached about causality, asbestos exposure being another, the research literature and the popular press are full of cases where causal impacts are in hot dispute. For example, currently bisphenol A, a chemical found in baby bottles and many other plastic products, has been tentatively associated with various health conditions. However, the extent to which the association is causal and the strength of the effect, if any, remain in dispute, and a long series of investigations will need to be conducted to resolve the matter.

Why is causal inference so difficult? Even in cases where RCTs are possible, the results are often open to challenge. In cases where randomized studies are not possible, due to ethical or other reasons, establishing causality is far more difficult. The concept of cause itself is famously elusive. Apart from definitional problems, attempts to elucidate sets of causal criteria, from David Hume to John Stuart Mill to Austin Bradford Hill, have not provided necessary and sufficient conditions for concluding that an observed association between two variables results from the causal impact of one on the other. From the standpoint of social science research, at least three issues are problematic. First, many philosophical discussions of cause begin with a deterministic relationship. If X changes, Y changes, by the same amount and for all cases under study. But in health services research relationships are usually probabilistic and heterogeneous. A change in X may or may not result in a change in Y , the amount of change may vary across units of the population, and changes in X may not be the only source of variation in Y . While statistical models are designed to cope with probabilistic outcomes, they are often based on assumptions that are difficult to defend (e.g., that the source of random noise in the data is uncorrelated with systematic sources of variation). A second problem, related to the first, is that variation in many outcomes is multicausal. For example, a teenager's proclivity to commit violent acts may have its origins in a variety of genetic and environmental factors, any one of which may be sufficient to cause violent behavior in some but not all persons exposed to the risk. Finally, in health services research, researchers are often interested in a causal sequence such that at a particular attribute, say race, puts an individual at varying levels of risk for some outcome, say discrimination, which in turn is reflected in a subsequent outcome such as access to healthcare. Demonstrating the validity of the mediational assumption is often difficult.

An important source of confusion is a failure to distinguish between research that seeks to find the *causes of an effect* and that which examines the *effects of causes*. In the former case, researchers seek to elucidate a set of variables that explain variance in some outcome, say the probability of preterm birth. The result may be a series of regression models in which various candidate variables

are considered as possible causes (risk factors) of the outcome. Not uncommonly, the variables are a mixture of demographic, biological, and psychosocial measures, and the researcher seeks to determine which of them are “important.” Studies of this kind are essentially descriptive, however sophisticated the statistical analysis, and open to the charge that this or that variable has been ignored or badly measured or that a particular population has been excluded. While it is true that work of this kind has a degree of cumulativeness as researchers come to agree on a set of relevant variables and then explore those variables in increasingly diverse populations, the process is slow and difficult to focus. Results are often presented with very little serious comparison to other studies in terms of effect sizes, samples, and other details. Given the usual constraints of journal publication, this is understandable but nonetheless lamentable.

Effects of Causes and Potential Outcomes

In contrast are studies that seek to determine the *effects of some cause*, say the effect of a particular health promotion intervention for expectant mothers on the probability of a preterm birth. Here, the focus is on a particular variable, which, at least potentially, can be manipulated. Indeed, one point of view is that of “no cause without manipulation,” ruling out causal effects of fixed attributes of individuals such as gender and race. While many argue with this point of view, at least potentially, the definition of *cause* can be lodged in the difference or change that comes about in an outcome variable as a result of exposure to different conditions. Other variables may be important, particularly if the study is not randomized, but by focusing on a particular well-defined potential cause, at least some difficulties are avoided.

Donald Rubin has formalized this idea in what has become known as the potential outcomes approach. The basic idea is quite simple. In a simple two-group study in which some subjects are exposed to some “treatment”—a drug, an educational program, a particular environment—and others are not, researchers can think of an individual as having a score on an outcome variable Y under both circumstances. For every individual i ,

there is potentially Y_{i_t} , person i in the treatment condition, and Y_{i_c} , the *same person* in the control condition. An obvious measure of effect then is $Y_{i_t} - Y_{i_c}$. But researchers do not see persons in both conditions; one of them is *counterfactual* and thus a form of missing data, a fact that has been called *the fundamental problem of causal inference*. This point is a bit subtle; typically researchers talk about “changes in X causing changes in Y .” The potential outcome approach asks researchers to think about changing the conditions under which a particular subject is observed, which leads to the counterfactual. These ideas easily generalize to multiple group designs.

Randomized designs assume that the potential effect of treatment is the same for subjects in both groups (i.e., that had subjects in the control condition been in the treatment group, the treatment effect for them would have been, on average, the same as it was for the subjects who were actually there). But when subjects self-select, it is possible that the treatment effect among the treated group would be quite different from the potential treatment effect among those who were not treated. Thus one can think about the treatment effect among the treated as opposed to the (potential) treatment effect among the non-treated. Even in crossover research designs, where subjects are observed in both conditions, they experience the conditions in a particular order (e.g., the control condition first, and for a given subject, the opposite order is counterfactual). For the sample two-group case, an obvious “solution” is to compute the difference in the means, $\bar{Y}_E - \bar{Y}_C$ as a measure of effect, realizing that the two means are computed on different groups of subjects, and the question then becomes whether that is justified.

Randomized Studies

A controlled experiment, in which subjects are assigned at random to two or more treatment conditions, is the bedrock of causal inference. This design, known in the medical literature as a randomized controlled trial (RCT), allows a researcher to rule out alternative explanations of observed postintervention differences between groups on the basis of long-run equivalence of the two groups, that is, the expected value of the group

means prior to the intervention being the same. Although investigators sometimes worry about *randomization failure* (i.e., the persistence of group differences on one or more variables after properly executed randomization), standard methods of statistical inference evaluate the probability of observed postintervention differences relative to the variability introduced by randomization. It is easy to show that if the assumptions are met, simple mean comparisons in a randomized study result in unbiased estimates of causal effect.

Despite its obvious strengths, the randomized design is not without problems. Randomization is sometimes more easily designed than done. Elaborate randomization schemes may not work in practice, research subjects may not comply with the treatment, and measurement may be biased in particular treatment groups. Generalization to the intended population (referred to as *selection bias*) is often a major source of difficulty. It may be difficult to recruit and retain subjects in RCTs, particularly those in which some risk is involved or in which a potentially effective treatment for some disease is withheld from members of the control group. In many cases, potential subjects for a study are relatively rare, and as a result the study is conducted at a number of different institutions that draw on populations that vary in numerous ways. Although a formal requirement for generalization (i.e., to support the computation of *p*-values in standard statistical analysis) is that the sample be drawn such that each member of a well-defined population has a known probability of inclusion, this is often not feasible. Instead, subjects are recruited from available sources, such as patients in medical practices or self-selected volunteers recruited in various ways. Thus, the experimental result may be generalized to an ill-defined local population, and the degree to which the intervention will be effective to the population at large is unknown.

When it can be conducted, the RCT remains the gold standard for causal inference. Unfortunately, in many areas of investigation, that standard is unreachable. In some cases, randomization is literally impossible. The effects of natural disasters on healthcare delivery are of intense interest, but hurricanes cannot be delivered at random. In other cases, randomization might, in principle, be feasible, but strong ethical barriers exist. One can

imagine a randomized study of the effects of breast-feeding but assigning mothers at random to conditions would encounter strong resistance both from ethics review boards and from the potential research subjects themselves. Finally, even when randomization is possible, it may only be feasible at the group level, as when particular hospital units and all patients in them are assigned to an intervention and other units are the controls. This design, known as a *group randomized trial*, brings with it other issues of analysis and generalization. In particular, the statistical power of such trials is notoriously low.

Observational Studies and Quasi-Experiments

In many cases then, randomized studies are simply impossible. In some cases, researchers might conclude that the trade-off between using data from a true probability sample that does not permit randomization versus a randomized study on a non-probability sample is worth it. An example in the United States is the Health and Retirement Study, in which a representative cross-sectional sample of the population 51 to 61 years of age was sampled at baseline and has been followed longitudinally for many years. Various life course events and transitions such as retirements and major illnesses occur over the course of the study. With observations at fixed intervals, these events occur more or less at random with respect to observation points, and investigators have varying amounts of pre- and postevent data. The determinants of such events can be studied (causes of effects), or their sequelae (effects of causes) can be studied. Thus the study is strong on one form of generalization at the expense of being weak on another. A study of this kind is usually referred to as *observational*, a word that highlights the passive nature of the design.

Although some researchers refer to any nonrandomized study as observational, quasiexperiments usually involve some comparison or manipulation of experimental conditions but without randomization and other aspects of control associated with true experiments. Sometimes the intervention is under the control of the researcher, such as providing an “exercise and healthy eating program” in a workplace to self-selected participants. In

other cases, the investigator takes advantage of a so-called natural experiment as might be the case when a health facility introduces an electronic clinical records system or when a change in regulation requires healthcare suppliers to deal suddenly with new clients. There are many variants on the quasiexperimental theme. Over the years, an elaborate classification of such designs, each assessed with respect to its various strengths and weaknesses, has emerged.

Faced with nonrandom assignment, the instinctive thing to do is to statistically adjust group comparisons for preexisting differences. A simple way to do this is via *blocking* or stratification of the sample on one or more variables that are associated with the outcome and that are differentially distributed across comparison groups. For example, if women were more likely to choose an exercise program than were men and it was suspected that gender was related to the outcome variable, gender could be treated as a design factor, although the result is frequently “unbalanced” because members of one gender self-select into a particular condition. This approach not only allows researchers to explore the effects of the intervention conditional on gender but also may substantially increase the statistical power of the analysis. It is relatively rare, of course, to have to deal with only one potentially contaminating variable. More commonly, there are many such variables, and researchers deal with them by treating them as linear covariates in regression-type models. This approach to analysis has been the backbone of many research areas for many years.

There are several difficulties with this approach, however. First, researchers never can know if the right covariates are in the model. In many cases, there are relatively few of the potentially important covariates actually observed. Second, most models treat the effect of covariates in simply linear and additive terms. In principle, this is not necessary; any functional form is admissible, and covariates can interact. However, relatively large sample sizes are required to deal with such complexities, and in any case, researchers often do not make the effort. A third issue is “balance.” Suppose researchers want to assess the effects of socioeconomic status (SES) on healthcare utilization. For simplicity, assume that SES is measured

in quartiles on some composite of education and income. Noting that race (measured simply as White/non-White in this example) is strongly correlated with the outcome, the researchers control on it. But the association of race and SES is such that the lowest SES quartile consists almost entirely of non-Whites and the reverse is true in the highest quartile. In such a case, what does it mean to look at the effects of SES, “holding race constant?”

Matching and Propensity Scores

One way to avoid the unbalanced comparison problem is by matching. Some decades ago, matching fell into some disrepute, largely as a result of the difficulty of matching on multiple variables. In fact, one can see the “blocking on gender” example above as a primitive form of matching. Recent work has led to a variety of sophisticated approaches to matching on multiple variables along with a set of weights indicating the quality of the match. A very popular approach is to create a set of propensity scores in which the researcher regresses a 0/1 indicator for group membership on a set of covariates and estimates the probability of being in one group or another based on them. The estimated probability summarizes all the available information in the covariates and allows the researcher to stratify the sample on propensity scores, assess the balance across groups on those scores, and carry out analyses within strata. Many other approaches are possible, including using the propensity scores directly in the analysis or as weights. These methods require the researcher to assume that all potential sources of bias are directly observed. More sophisticated methods, particularly when longitudinal data are available, permit researchers to control on unobserved sources of bias as well.

Statistical Approaches

Whether or not researchers match in some fashion, in recent years, several statistical approaches to dealing with nonequivalent comparison groups have emerged. The space available does not permit a lengthy discussion here, but two approaches bear mentioning. The first is to model

the selection process itself. Ideally, researchers look for one or more variables that determine selection but that are correlated with the outcome only via the effects on treatment. That is, the variables in the selection equation cannot have a direct effect on the outcome. Finding such variables is not easy, although not impossible. A famous example is the random selection of birth dates to determine eligibility for the Vietnam era military draft. Researchers interested in the effects of military service on later income were able to use birth date as an instrument for military service in income estimation equations. Causal estimates from models of this kind are strongly dependent on assumptions and require careful sensitivity analyses. Recent statistical work has focused on establishing upper and lower bounds for effects in these kinds of models and others.

A second approach is known as the regression discontinuity design. Suppose that selection for treatment is based on some cutoff on a continuous measure, for example access to subsidized medical care. All subjects below an income cutoff get the treatment, while those above it do not. Obviously, the cutoff is somewhat arbitrary, and those just above the cutoff are probably not a great deal unlike those just below it. As a result, a regression of the outcome variable on the selection variable is likely to show a jump (a change in the intercept) and perhaps a change in the slope of the regression line at the cutoff.

Future Implications

It is comparatively rare for a single randomized study to definitively resolve a causal question and even rarer for an observational study to do so. Studies which seek to isolate causes of effects rather than effects of causes are unlikely to ever do so. Still, as the history of research on smoking and health demonstrates, resolutions are achievable. Technical approaches to summarizing available information, such as meta-analysis, continue to grow in sophistication. So also do institutionalized means of reconciling controversial and conflicting evidence such as the U.S. Preventative Agencies Task Force and formal National Institutes of Health (NIH) consensus conferences. The process is slow and sometimes discouraging. In most cases, even for most well-designed randomized

studies, close replication is essential. Somehow, regardless of statistical niceties, researchers are generally more confident of independent replications that reach the same conclusions. With regard to observational studies, the conclusions of which tend to be assumption-dependent, supportable conclusions tend to be achieved when researchers have conducted a series of studies that reach similar conclusions in the face of a substantial variation in design and analysis rather than from exact replications. Usually, that variation occurs in an unplanned way, and thus the time to reach a consensus is longer than it might be in the face of a more systematic approach. This is unfortunate because the public finds itself buffeted by each sequence of studies that contradict previous well-publicized results, and public confidence in the research enterprise often suffers as a result. Still, a great deal of significant work in causal inference has been accomplished in recent decades, the result of which has at least been increased clarity in what needs to be done. Two things head the list: rapid and wide diffusion of techniques more appropriate than simple regression models for the analysis of observational data; and greater insistence from journal editors that authors take prior work seriously, carefully specifying how the research design and results of their own analyses differ from the best prior work.

Richard T. Campbell

See also Cohort Studies; Cross-Sectional Studies; Epidemiology; Measurement in Health Services Research; Meta-Analysis; Public Health; Randomized Controlled Trials (RCTs); Risk

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- American Statistical Association (ASA): <http://www.amstat.org>
- National Institutes of Health (NIH): <http://www.nih.gov>

CENTER FOR STUDYING HEALTH SYSTEM CHANGE

Founded in 1995, the Center for Studying Health System Change (HSC) is a nonpartisan policy research organization based at Washington, DC, focused on changes in the financing, delivery, and quality of healthcare in the United States, with a particular emphasis on the policy implications of these changes. The HSC strives to provide high-quality, timely, and objective research and analysis that lead to sound policy decisions, with the ultimate goal of improving the health of the American public. Instead of advocating for particular policies, the HSC serves as an honest broker of information for policymakers, the news media, employers, healthcare providers, health insurers, and the public.

All research undertaken by the HSC is consistent with the organization's mission to inform healthcare decision and policymakers about changes in the healthcare system at both the local and national levels. The HSC is funded principally by the Robert

Wood Johnson Foundation (RWJF) but also conducts research consistent with its mission for others, including foundations and government agencies. The HSC is affiliated with Mathematica Policy Research, a leader in evaluating the effectiveness of local, state, and federal, health, human services, and educational programs.

To preserve the HSC's reputation for high-quality, independent, and nonpartisan research, nurtured and sustained during the long period when the RWJF was the sole source of support, the HSC only accepts funding when it retains the right to publish all research results. Final research topic selection, methodological, and editorial decisions ultimately reside with the HSC. Guided by these principles, the HSC seeks research support from many different types of sources: government entities, foundations, and private nonprofit and for-profit organizations.

Healthcare in Communities

Ultimately, all healthcare is organized and delivered in local communities—where the HSC collects information about the changing health system. The HSC's main research tool is the Community Tracking Study (CTS), which consists of national surveys of consumer households and physicians. The HSC also conducts intensive site visits at 12 metropolitan communities selected randomly to be representative of the nation. Led by Paul B. Ginsburg, a nationally known health economist and health policy expert, the HSC researchers combine quantitative and qualitative research from the surveys and site visits to provide policymakers with a vibrant picture of changing healthcare market dynamics and the implications for healthcare policy. The HSC researchers—economists, physicians, sociologists, and public policy experts—are knowledgeable about a wide range of healthcare policy topics. Their areas of expertise include private health insurance coverage, access to healthcare by the uninsured, healthcare quality, and healthcare markets. The HSC researchers regularly publish in peer-reviewed journals, including *Health Affairs*, *The New England Journal of Medicine*, *The Journal of the American Medical Association*, *Archives of Internal Medicine*, *Inquiry*, and *Health Services Research*.

Key Policy Research Areas

The HSC's focus on local market dynamics allows it to provide targeted research that can contribute to better health policy. To assist policymakers, the HSC focuses on four key policy research areas: health insurance coverage and costs, access to healthcare, quality and healthcare delivery, and healthcare markets.

National Household and Physician Surveys

Since 1996, the HSC has conducted four national surveys of American households and physicians and is in the process of conducting the fifth survey. Approximately 46,600 people in 25,400 families take part in the household survey, which focuses on assessing whether consumers' access to healthcare is improving or declining over time. The household survey also explores patients' satisfaction with the healthcare they receive and with their health insurance coverage. Approximately 6,600 practicing physicians across the nation provide survey information about how the practice of medicine is changing. In the physician survey, they respond to questions about their ability to provide needed services for patients, how much charity care they provide, how they are compensated, and other topics.

Site Visits to Nationally Representative Communities

In 2007, the HSC completed its sixth round of intensive site visits to Boston, Massachusetts; Cleveland, Ohio; Greenville, South Carolina; Indianapolis, Indiana; Lansing, Michigan; Little Rock, Arkansas; Miami, Florida; northern New Jersey; Orange County, California; Phoenix, Arizona; Seattle, Washington; and Syracuse, New York. In each community, the HSC researchers interviewed between 50 and 100 local healthcare leaders, including employers, physicians, hospital executives, policymakers, safety net providers, and health insurers.

Additional Research Projects

Although principally funded by the RWJF, the HSC also conducts research for others consistent

with its mission. Recent and current funders include the Agency for Healthcare Research and Quality (AHRQ), the California HealthCare Foundation, the Commonwealth Fund, the Henry J. Kaiser Family Foundation, the National Institute on Aging, the National Cancer Institute, the Health Care Financing and Organization Program of the RWJF, and the U.S. Department of Health and Human Services, Assistant Secretary for Planning and Evaluation.

Timely Access to Publications and Related Data Files

The HSC is committed to providing policymakers, the news media, the public, and researchers with convenient and timely access to its survey data files and related publications. The HSC's publication series includes *Issue Briefs*, *Data Bulletins*, *Tracking Reports*, and *Research Briefs*—all of which combine to provide detailed information on survey and site-visit findings. All the HSC's publications and public-use and restricted-use data files are available on its Web site. The HSC also offers a convenient e-mail notification service to alert interested parties to its new publications and research that is available on its Web site.

CTSONline

CTSONline is an easy-to-use, Web-based tool provided by the HSC to allow policymakers and the public to quickly access and interpret data from its surveys.

Alwyn Cassil

See also Access to Healthcare; Forces Changing Healthcare; Ginsburg, Paul B.; Healthcare Financial Management; Health Insurance; Mathematica Policy Research (MPR); Quality of Healthcare; Robert Wood Johnson Foundation (RWJF)

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Center for Studying Health System Change (HSC):
<http://www.hschange.org>

CENTERS FOR DISEASE CONTROL AND PREVENTION (CDC)

The Centers for Disease Control and Prevention (CDC), which is part of the U.S. Department of Health and Human Services (HHS), is the nation's premier and largest public health organization. The CDC is composed of the Office of the Director, the National Institute for Occupational Safety and Health (NIOSH), and six coordinating centers and offices. With its headquarters in Atlanta, Georgia, the CDC employs more than 14,000 employees in 170 occupations. Most of its employees work at its headquarters, but others work in Washington, D.C., in other cities in the nation, and in more than 40 foreign countries.

History

The CDC evolved out of a World War II malaria control program—Malaria Control in War Areas

(MCWA). Formally established in July 1, 1946, the organization was originally known as the Communicable Disease Center (CDC). The CDC's early work concentrated on malaria control in the United States. However, it was soon engaged in other public health problems such as polio by providing assistance to local governments and public health departments facing epidemics and disasters. Over time, the CDC's mission continued to broaden, expanding beyond infectious diseases to include chronic diseases, nutrition, and occupational and environmental health. To reflect these changes, the organization has changed its name a number of times; however, it has always kept the same acronym, CDC. In 1970 it changed its name from the Communicable Disease Center to the Center for Disease Control, in 1980 to the Centers for Disease Control, and in 1992 to its current designation, the Centers for Disease Control and Prevention.

Goals and Strategic Areas of Focus

Currently, the CDC has four stated organizational goals. Specifically, it works to have (1) healthy people in every state of life by reducing health risks; (2) healthy people in healthy places by ensuring that all locations including where people live, work, and play are healthy environments; (3) people prepared for emerging health threats by safeguarding them and responding to threats; and (4) healthy people in a healthy world through efforts to improve global health using medical technology, international coalitions, government interventions, and behavior changes.

To reach these goals, the CDC focuses on six strategic areas: (1) health impact focus—align the CDC staff and other resources to maximize health; (2) customer-centricity—provide what people want; (3) public health research—create and disseminate healthcare knowledge; (4) leadership—use the CDC's expertise to improve health; (5) globalization—extend the CDC's knowledge around the world; and (6) accountability—sustain confidence and trust.

Organizational Structure

The current organizational structure of the CDC includes the Office of the Director, the National

Institute for Occupational Safety and Health (NIOSH), and six coordinating centers and offices: (1) Coordinating Center for Health Information and Services, (2) Coordinating Center for Health Promotion, (3) Coordinating Center for Infectious Diseases, (4) Coordinating Center for Environmental Health and Injury Prevention, (5) Coordinating Office for Terrorism Preparedness and Emergency Responses, and (6) the Coordinating Office for Global Health.

Office of the Director

The Secretary of the HHS appoints the director of the CDC. The heads of each of the CDC's six coordinating centers and NIOSH as well as the heads of nine offices directly report to the director. The reporting offices include the following: Office of Chief Science Officer; Office of Chief of Public Health Practice; Office of Chief Operating Officer; Office of Strategy and Innovation; Office of Workforce and Career Development; Office of Enterprise Communication; Office of Chief of Staff; Office of Dispute Resolution and Equal Opportunity; and the CDC Washington Office.

National Institute for Occupational Safety and Health (NIOSH)

Headquartered in Washington, D.C., with research laboratories in Cincinnati, Ohio; Morgantown, West Virginia; Pittsburgh, Pennsylvania; Spokane, Washington; and Atlanta, Georgia, and with a staff of more than 1,400 employees, NIOSH is the largest division of the CDC. NIOSH is responsible for conducting research on new safety and health problems and making recommendations for the prevention of work-related injury, illness, disability, and death. Its specific objectives include conducting research to reduce work-related illness and injuries; promoting safe and healthy workplaces; and enhancing global workplace safety and health through international collaborations.

Coordinating Center for Health Information and Services

This CDC coordinating center oversees three centers that provide the public with access to information and statistics on a variety of health topics.

The National Center for Health Marketing provides current, science-based information to the public. It conducts research in the area of health marketing and communicates and publishes the results. This center is responsible for publishing the *Morbidity and Mortality Weekly Report (MMWR)*, which reports on disease trends and outbreaks each week. The center also runs the Health Alert Network (HAN), which provides instant information regarding serious health threats to a network of public health departments across the nation. The Public Health Training Network, another service of the center, is a professional development resource for public health workers, which provides listings of conferences and workshops, satellite broadcasts, and other learning opportunities of which public health workers may avail themselves.

The National Center for Health Statistics (NCHS) collects data from a variety of sources. The data are then used to identify and address health problems. The NCHS tracks trends in births, deaths, marriages, divorces, the aging population, hospital discharges, nursing home residents, and many other topics. Its data are widely used by policymakers, researchers, and public health professionals to address various health problems.

The National Center for Public Health Informatics coordinates technology-based applications to achieve CDC's goals. The use of computers and associated applications has become increasingly important in the public health field. The center also works to support other CDC centers and offices.

Coordinating Center for Health Promotion

This CDC coordinating center oversees two centers: (1) the National Center on Birth Defects and Developmental Disabilities and (2) the National Center for Chronic Disease Prevention and Health Promotion.

The National Center on Birth Defects and Developmental Disabilities conducts research and health promotion efforts addressing the causes of birth defects and provides resources to people dealing with these conditions. The center's programs work to educate women about healthy pregnancy. It also strives to provide resources and information about developmental disabilities such

as hearing loss, cerebral palsy, mental retardation, and other conditions.

The National Center for Chronic Disease Prevention and Health Promotion focuses on preventing chronic disease conditions such as heart disease, cancer, and diabetes. Chronic diseases are among the leading causes of death in the United States, and this center coordinates research and health promotion efforts to inform interventions and target illnesses. In addition to health disease, cancer, and diabetes, the center's programs also address chronic conditions such as stroke, epilepsy, and arthritis.

Coordinating Center for Infectious Disease

This CDC coordinating center oversees four centers that target specific infectious diseases. The four centers are (1) the National Center for HIV/AIDS, Viral Hepatitis, STD and TB Prevention; (2) the National Center for Immunization and Respiratory Diseases; (3) the National Center for Zoonotic, Vector-Borne, and Enteric Diseases; and (4) the National Center for Preparedness, Detection, and Control of Infectious Diseases. Each of these centers targets a specific type of infection, such as tuberculosis, sexually transmitted diseases, and the West Nile virus, and focuses on its prevention, control, and treatment efforts.

Coordinating Center for Environmental Health and Injury Prevention

This CDC coordinating center oversees two centers: the National Center for Environmental Health/Agency for Toxic Substances and Disease Registry; and the National Center for Injury Prevention and Control.

The National Center for Environmental Health conducts research, surveillance, and education related to the interaction between humans and the environment. Its responsibilities include protecting the public from hazards in the environment. This center has three divisions: (1) the Division of Emergency and Environmental Health Services, (2) the Division of Environmental Health Hazards and Health Effects, and (3) the Division of Laboratory Sciences.

The Division of Emergency and Environmental Health Services works to develop policy initiatives

and prevention activities related to environmental public health emergencies. The programs within this division address several health issues such as the safe and healthy use of land, elimination of chemical weapons, food and water safety, sanitation, housing, lead poisoning, and the health and well-being of refugees. In relation to disease investigation, this division monitors cruise ships for cases of gastrointestinal illness.

The Division of Environmental Health Hazards and Health Effects conducts research and education relating to the interaction of humans and the environment, including activities that focus on air pollution and respiratory health, asthma, carbon monoxide, and radiation.

The Division of Laboratory Sciences investigates exposure to toxic chemicals and other substances in the environment, and their effects on human health, through the use of laboratory methods. Through the testing of blood and urine samples, scientists in the laboratory are able to measure the amounts of chemical substances in a person's system.

The Agency for Toxic Substances and Disease Registry (ATSDR) is also housed with the coordinating center. The ATSDR is 1 of the 13 federal agencies with the HHS. It is mandated by the U.S. Congress to conduct specific activities that relate to hazardous substances in the environment. The agency's responsibilities include monitoring of waste sites, health consultations, surveillance, education and training, and research. The ATSDR is one agency that responds to emergencies caused by the release of hazardous substances. It also develops information for the public regarding hazardous substances.

The National Center for Injury Prevention and Control is the lead agency in the nation's efforts to prevent unintentional injuries. This center tracks cases of injury and assesses their associated risk factors. One well-known publication of the center is a list of the 10 leading causes of death. This list, which is compiled annually by various age groups, is widely used by educators, researchers, and public health professionals in their efforts to prevent injury.

Coordinating Office for Terrorism Preparedness and Emergency Response

This office addresses emergency preparedness for natural disasters and terrorist attacks. The

office educates first responders, healthcare professionals, and the general public about the types of emergencies that may occur. It also provides information on recent outbreaks, natural disasters, and other emergency events. Additionally, state and local health agencies take their lead from this office, and the office oversees grants and support to state, local, and community preparedness efforts.

Coordinating Office for Global Health

This CDC office partners with other health agencies and works to address global public health threats. The office's International Experience and Technical Assistance Program trains public health workers at the federal level to increase experience at the international level. Its Division of Epidemiology and Surveillance Capacity Development initiative works toward improving the disease investigation infrastructure at an international level. This division provides technical assistance to foreign nations, partners with international organizations to improve surveillance for infectious diseases, and works toward disease prevention efforts. The office's Sustainable Management Development Program collaborates with global partners to provide leadership and development of public health systems worldwide. The program attempts to look beyond theory and focuses on skills-based initiatives.

Future Implications

The CDC is the nation's, and to a great extent the world's, public health department. Its public health efforts, coordinated through the NIOSH and its various coordinating centers and offices, focus on disease prevention and health promotion, disease investigation and surveillance, and emergency and disaster preparedness. Today, and in the foreseeable future, the CDC will remain the global leader in public health.

Kristin Hartsaw

See also Bioterrorism; Disease; Emergency and Disaster Preparedness; Epidemiology; National Center for Health Statistics (NCHS); Pan American Health Organization (PAHO); Public Health; World Health Organization (WHO)

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- Centers for Disease Control and Prevention (CDC): <http://www.cdc.gov>
- National Center for Health Statistics (NCHS): <http://www.cdc.gov/NCHS>
- U.S. Public Health Service (USPHS): <http://www.usphs.gov>

CENTERS FOR MEDICARE AND MEDICAID SERVICES (CMS)

The Centers for Medicare and Medicaid Services (CMS), formerly known as the Health Care Financing Administration (HCFA), is a federal agency within the U.S. Department of Health and Human Services (HHS). CMS is the nation's largest purchaser of healthcare, it is responsible for administering the Medicare program, and it works collaboratively with states to administer the Medicaid program and State Children's Health Insurance Program (SCHIP). Additionally, CMS also works to simplify the standards associated with the Health Insurance Portability and Accountability Act of 1996 (HIPAA), ensure quality standards in long-term care facilities through surveys and certification, and maintain clinical laboratory standards of quality through the

Clinical Laboratory Improvement Amendments (CLIA). The agency employs nearly 4,100 employees and serves approximately 92 million individuals through all its programs. The CMS headquarters is located in Baltimore County, Maryland, with an office at the Hubert H. Humphrey Building in Washington, D.C., and 10 regional offices across the country.

Overview

President Lyndon B. Johnson signed the legislation that established the Medicare and Medicaid programs into law on July 30, 1965. Initially, the Social Security Administration (SSA) administered the Medicare program, while the Social and Rehabilitation Service Administration (SRA) ran the Medicaid program under the purview of the Department of Health, Education, and Welfare (DHEW). However, because of growing healthcare costs, the HCFA was formed in 1977 to coordinate both the Medicare and the Medicaid programs under the auspices of DHEW. In 1980, DHEW was divided into the Department of Health and Human Services (HHS) and the Department of Education (DOE), with the HHS overseeing the responsibilities of the HCFA.

The agency was later renamed the Centers for Medicare and Medicaid Services in 2001 to reflect its mission better. CMS's vision is to transform and modernize the U.S. healthcare system.

Today, CMS serves the elderly and disabled through its Medicare program, the low-income population through Medicaid, and children and families through SCHIP. The Medicare and Medicaid programs combined account for nearly one third of the nation's healthcare expenditures. The agency is dedicated to administering its program as efficiently as possible. In FY2009, the estimated total benefit costs are expected to be \$703.9 billion.

Medicare

CMS has the primary responsibility of administering the nation's Medicare program. Medicare is a health insurance program for individuals aged 65 or older, individuals with certain disabilities, and

those with end-stage renal disease. Since its inception, the Medicare program has grown 130%, from 19.1 million enrollees in 1966 to 43.9 million in 2007.

In 2003, one of the most significant changes to the Medicare program since its inception was signed into law. The Medicare Modernization Act (MMA) included provisions for an outpatient prescription drug benefit for Medicare beneficiaries and several other changes to the program.

Medicaid

Medicaid is a joint state and federal program that provides healthcare coverage to certain groups of low-income individuals and families who qualify. The states administer the program, and they may set their own eligibility and benefits guidelines. To participate in the Medicaid program, certain requirements need to be met such as age, income, disability, and citizenship. The average monthly enrollee for the Medicaid program in 2007 was estimated to be 48.1 million individuals, with the largest group being children.

State Children's Health Insurance Program

In 1997, SCHIP was created to address the needs of uninsured children. SCHIP is a program funded jointly by the federal government and states and it is administered by the states. This program provides low-cost health insurance coverage to children and families. Each state determines the eligibility, benefits, design, payment level, and operating procedures for the SCHIP program within federal guidelines. Under this program, the states are given a capped amount of matching funds by the federal government.

Research

CMS collects and maintains a wealth of quantitative data on its programs and makes them available to researchers. These data include information on claims, spending, and enrollment. The agency is also involved in conducting its own research efforts, such as examining patterns in prescription drug use, risk-adjustment methods for different

payment systems, quality initiatives, and consumer assessments. In addition, CMS performs demonstration projects to examine alternative policies for healthcare coverage and delivery. The Office of Research, Information, and Development within CMS coordinates these activities.

Some of the agency's initiatives include the Consumer Assessment of Health Providers and Systems (CAHPS) Survey, Health Outcomes Survey, Hospital Compare, and pay-for-performance. CMS also publishes a subscription journal, *Health Care Financing Review*. The review is dedicated to improving the understanding of the Medicare and Medicaid programs and the U.S. healthcare system by examining delivery and financing issues.

Outreach and Education

CMS provides numerous outreach and education initiatives to assist healthcare providers, professionals, and volunteers with its programs. The Medicare Learning Network (MLN) presents educational information to fee-for-service healthcare providers and promotes the responsiveness of the agency. MLN also helps providers deal with changes in Medicare policy. The National Medicare Training Program (NMTP) provides training to professionals and volunteers to help Medicare beneficiaries make informed decisions. The Provider Communications Group at CMS develops and disseminates provider education campaigns that involve Medicare fee-for-service programs. Through these various outreach and educational efforts, CMS employs a diverse set of methods using the Internet, fact sheets, brochures, videos, and Web-based training courses.

Future Implications

The Medicare and Medicaid programs will face a number of challenges in the future. The aging of the nation's population and the demand to meet the growing entitlement has raised serious questions regarding the solvency of the programs. Despite this, the CMS continues to serve the needs of its beneficiaries by ensuring healthcare coverage to millions of Americans. Although many

challenges remain, with increased enrollment and rising healthcare costs, the agency strives to further the vision of President Lyndon B. Johnson's Great Society to provide accessible, high-quality healthcare for the elderly, disabled, and poor.

Jared Lane K. Maeda and Raymond Swisher

See also Health Insurance Portability and Accountability Act of 1996 (HIPAA); Medicaid; Medicare; Medicare Part D Prescription Drug Benefit; Medicare Payment Advisory Commission (MedPAC); State Children's Health Insurance Program (SCHIP)

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Web Sites

- Centers for Medicare and Medicaid Services (CMS): <http://www.cms.hhs.gov>
- Hospital Compare: <http://www.hospitalcompare.hhs.gov>

CERTIFICATE OF NEED (CON)

Certificate of need (CON) is a state-level regulatory process first established more than 40 years ago for the purpose of rationalizing the growth and distribution of hospitals, other health facilities such as nursing homes and ambulatory surgery centers, and expensive healthcare equipment and services. In this process, a hospital or other healthcare provider must establish through an analysis that a need exists in a specific service area for the new or expanded facility or proposed service. This analysis is reviewed by a state agency or appointed health services planning body, often in a formal public hearing during which sponsors and opponents of the proposed expenditure can argue their case. If a determination is made that a need actually exists consistent with the sponsor's proposal, a CON is issued that grants the sponsor permission to proceed with the project. Currently (2007), 36 states plus the District of Columbia and the Virgin Islands have CON legislation in place. CON has been controversial during most of its history, with much of the debate centering on whether it is necessary, if it actually works, and more fundamentally, if a regulatory tool is an appropriate way to plan and control aggregate health-related investment in the United States.

CON was established at a time when healthcare services in the nation were undergoing a period of profound growth, driven by the expansion of employer-sponsored health insurance and the Medicare and Medicaid programs, along with federal subsidies for hospital construction. Prior to the end of World War II, health services grew slowly, with little investment for new hospitals or modernization. At that time, all but the largest teaching hospitals were sponsored by or affiliated with a specific community, a religious denomination, or a fraternal organization. Hospital construction and modernization at that time was financed by philanthropic and community fund raising efforts. The expansion of private and public health insurance allowed hospitals to generate needed capital internally from patient revenues. Beyond this internal source, the 1946 federal Hill-Burton Act provided grants to hospitals for construction and modernization.

By the mid-1960s, the nation's total healthcare spending had accelerated to a point where the concerns about hospital bed shortages of 20 years before were replaced with concerns that the U.S. healthcare system was becoming too expensive and that healthcare costs were out of control, largely because of unregulated construction, expansion, and purchase of new technology. Since 1966, a voluntary form of health planning and CON existed in a growing number of states. Rochester, New York, piloted the concept in 1964, where a coalition of local businesses and Blue Cross established a community health planning council to evaluate hospital need. Impressed by the Rochester experiment, and spurred by the federal Comprehensive Health Planning Act (PL 89-749) of 1966, New York State, followed closely by Maryland, Rhode Island, and the District of Columbia, soon enacted CON legislation. Voluntary CON was eventually established in 29 states prior to the federal mandate. In 1974, the U.S. Congress enacted the National Health Planning and Resources Development Act (PL 93-641), making CON mandatory for all states as a condition for receiving certain federal funds. By 1978, 42 states plus the District of Columbia had enacted CON laws, with CON in place in all states except Louisiana by 1986, when federal funding for CON ended.

Rationale

The rationale behind the use of CON to control the supply of medical services was based on a belief that normal economic market forces that bring demand and supply into balance for other goods and services would not work for medical services. There were several reasons why this was believed to be true. On the demand side, unlike other goods and services in the marketplace, consumers don't make an informed decision about which medical care service they will receive. First, as medical care is highly specialized and complex and beyond the understanding of most consumers, this decision is usually made by the person's physician. Seldom will a person refuse a medical service on cost grounds alone if the physician recommends it. Second, with the growth of health insurance coverage, patients don't directly pay for

the services they receive. Third-party payment insulates patients from the costs of medical services except for those that are paid out of pocket. Third, without quality or cost information, patients usually don't comparison-shop for medical services; and, when they do, they often wait until the time when they need the services for some acute medical condition. This puts the patient at a disadvantage in being able to behave as a consumer normally would.

On the supply side, unlike the case with most other goods and services in the marketplace, healthcare providers did not compete on price. Indeed, prices of medical services were seldom made public, and patients usually never knew the price of the service they were to receive until after they (or more accurately their insurance company) received the bill for the service. In addition, the supply of medical services seemed to generate its own demand. For example, a good predictor of surgical rates in a community was the number of surgeons, regardless of population need. So if two communities of similar size and population characteristics were compared, the one with the greater number of surgeons would likely have more surgeries performed. For hospital services, this phenomenon was so pronounced that it became known as the Roemer Effect, after the researcher who first noticed the relationship where "a bed built, is a bed filled." A community with more hospital beds is likely to fill those beds, regardless of population need.

Goals

While cost containment was the overriding motivation for CON, the 1974 federal health planning legislation outlined two primary purposes. The first was restraining skyrocketing healthcare costs, which was to be done through controlling the expansion of new healthcare services and preventing underutilization and unnecessary duplication of healthcare resources, which was thought to be the primary cause of skyrocketing healthcare costs. The U.S. Congress at the time found the national need for additional hospital beds had virtually disappeared, and as of 1974, an aggregate surplus of 20,000 underused beds existed.

CON had a second primary purpose, which was to achieve equal access to quality healthcare

at a reasonable cost. This often-overlooked purpose connected CON to a common thread in prior federal health legislation, including Hill-Burton, the comprehensive health planning act, and the landmark Medicare and Medicaid legislation. This reflected a deeply rooted concern that the nation's healthcare resources should be allocated in an equitable manner. Medicare and Medicaid made healthcare services affordable to the elderly and the poor. CON was to ensure that healthcare capital investment would not bypass low-income or rural communities as the U.S. healthcare system grew. This goal was linked to cost containment in recognizing that equal access would not be possible if healthcare services were not also affordable, and so controlling healthcare inflation was required to keep costs reasonable. Achieving this second purpose presented a challenge, as while CON provided a regulatory tool to limit capital investment that was proposed, it could not compel investment in an area deemed financially undesirable to a healthcare provider. However, by having the regulatory expectation that the needs of low-income communities should be considered, CON reviews were often able to leverage consideration of these needs in proposals that otherwise would not have done so.

Scope

While hospital construction and expansion was the initial focus of CON, given the relatively high cost of hospital facilities, it was soon realized that hospital building alone was not the only driver of healthcare costs. With advances in medical technology, new services, exotic imaging devices, and sophisticated treatment modalities were also being introduced. While most of these advances were hospital based, some were being proposed for other noninstitutional sites, including freestanding facilities where the new service or technology would be provided. These included most notably diagnostic scanners (e.g., CT, MRI, PET) and radiation beam treatment devices (linear accelerators and gamma knives). At the other end of the technology spectrum, long-term care services were also becoming a significant driver of runaway healthcare cost, and so nursing homes were an early focus of CON in all states.

After 1986, the range of review of facilities, services, and equipment covered by CON varied from state to state. Currently, some states take a comprehensive approach covering upward of 30 categories of service. Most states are less comprehensive, targeting CON to those services thought to be major cost drivers. Beyond service categories, states also adopted a financial threshold approach to CON, reviewing only those proposals that exceed a dollar threshold. Since the end of federal funding, state financial thresholds have varied greatly, ranging from under a \$0.5 million to more than \$10 million. The rationale for this approach is that the more expensive proposals are likely to make the most significant contribution to rising health costs.

Regulation Versus Planning

CON is at best only a partially effective remedy for achieving access points. It was never meant to be the only tool for either controlling cost or enhancing access but was to be partnered with health planning. The 1974 act set up a nationwide network of more than 200 community-based health planning agencies or health system agencies (HSAs) whose principal function was to develop local and state health system plans that attempted to bring into balance community needs with facilities and resources required to meet those needs. In each state and region, plans were drafted by a staff of professional health planners under the direction of an agency governing body of healthcare providers, consumers, educators, insurers, and local government officials. Hospital and nursing home administrators, along with practicing physicians and other healthcare professionals, were often among agency board members. The plans developed were to provide the framework that was to guide new construction, modernization, and the introduction of new expensive medical equipment and services by hospitals and other providers in the community. CON was intended to “put teeth” into the plans and the planning process. State CON laws usually called for an initial review by the local health system’s agency prior to consideration by the state CON body. A proposal would have to be judged consistent with the local plan to get a favorable review by the local agency, and the

favorable local review was a strong consideration in the review at the state level.

The composition of the local reviewing board often gave an advantage to the projects of local providers over those proposed by outsiders. And providers were seen as having undue influence on decisions of the local planning agency, sometimes leading to rejection at the state level of locally approved proposals. This attitude that CON was better in principle than in practice, especially when applied to a well-supported hospital expansion project, was one factor that led to its eventual unpopularity, its limited effectiveness, and the repeal of the federal mandate. Nonetheless, the linking of CON with planning at a local level provided an effective context to apply CON as a tool for achieving affordable access, as well as cost containment, as proposals could be reviewed against a plan that had specified local needs and optimal service performance. The local review process provided a mechanism to negotiate how those needs could be explicitly considered in the proposal under review.

Regulation Versus Competition

Nationally, regulation and CON fell out of favor as an approach to control healthcare costs after 1980, driven by several forces. First was the growing unpopularity of CON among healthcare providers and some communities whose projects did not receive CON approval. A second factor was that, despite the existence of mandatory CON in 49 states, healthcare costs continued to rise at an alarming rate. So, at least on the surface, there was a lack of clear evidence that CON was an effective cost containment tool. Third, and perhaps most significant, was the election of President Ronald Reagan. The year 1980 marked the ascendancy of a conservative trend in American politics and, with it, a belief that market forces and competition were more appropriate than regulation, which was seen generally as a tool of big government. Managed competition and especially managed care replaced planning and CON as the hope for controlling costs. Competition held up the promise of introducing market forces into healthcare, the lack of which was the reason behind the need for planning, regulation, and CON in the first place. In response to these forces,

in 1983, the U.S. Congress repealed the 1974 Health Planning Act and with it the federal mandate for CON (a continuing resolution maintained state funding for another 3 years). Without the federal mandate, some states began to repeal and roll back their CON laws, and the network of local health planning agencies started to dissolve. However, CON was retained in some form by most states, with only a handful opting for an outright repeal.

Throughout CON's history, healthcare providers have taken a contradictory posture toward it, largely reflecting the regulatory versus competition debate. In the early years, hospitals, in particular, were generally supportive of CON, recognizing the need for some form of planning. But as healthcare services began to look more like an industry, a belief that market forces and competition should work began to take hold, and opposition to CON increased. This opposition was behind the repeal of CON laws in 14 states and the paring down of CON's scope or raising reviewability thresholds in others. But hospitals also recognized that too much competition would not be good for existing hospitals, which might find themselves competing with neighboring facilities or, worse, a new for-profit corporately owned hospital, likely with better access to capital for new constructions and the latest medical technology. Under these conditions, CON resembled a franchising mechanism for existing facilities, protecting them from unwelcome competitors. Thus, many hospitals came to support CON in principle, but always looking for ways to reduce its impact on them while using it as a barrier against competitors.

Physicians as a group were less likely to support CON and were often the force behind hospital expansion and demands for new equipment and sophisticated services such as open-heart surgery. In addition, as a profession, physicians have long been more likely to exhibit an entrepreneurial streak. With the help of creative practice managers, physicians soon saw opportunities to directly purchase new technology and offer new services in physician-owned freestanding diagnostic and treatment centers. Consequently, physicians have usually been in the lead in opposing CON, a government-sponsored program, which they saw as thwarting their private business plans.

CON Today

CON in the 36 states where it still exists varies broadly from state to state but in general seems to have shifted in some common ways. Without the existence of local plans against which to judge need or at least place the need within a local context, CON determination is now largely based on meeting state-established performance and charity standards, oftentimes divorced from their local context. In one way, CON has become an even more regulatory process despite the continued national skepticism toward government regulation. With this regulatory character, the CON process has become as much concerned over procedural issues as with the substance of need, access, and costs, and the process has become as much an arena for lawyers and economists as for health planners and regulatory analysts. Without local agencies to represent broader community interests, the CON process is often dominated by networked institutional providers, specialized medical practitioners, and their lawyers, consultants, and lobbyists, who mount well-polished presentations to support their proposals. Opposition to a proposal may be raised on technical grounds (standards and criteria) by the staff of the state planning or CON agency, but the regulators, too, can be as much concerned about procedural issues as substance. The occasional effective opposition to a proposal is usually offered by a competing provider that has the resources to mount a case. In this environment, one of the original purposes of CON, which is achieving equal cost-effective access to quality healthcare, has taken a back seat.

Yet in many states, CON still retains much of its original character and function. And more recent evidence now shows that it can be an effective tool to control costs, expand access, and enhance healthcare quality. Studies reported by the American Health Planning Association (AHPA) of healthcare costs in states where the big-three automakers have a major presence have shown that employee and overall per-person healthcare costs are lower in states with CON. Other studies have also found that states with CON have lower costs for some regulated healthcare services as well as lower mortality for certain serious, but common, surgical procedures such as coronary artery bypass. Both of these findings support the original purpose of CON.

The future of CON is likely to be determined not only by its effectiveness as a cost containment tool but also by its political support within each state and the broader national climate. CON may continue to be one part of an evolving mix of strategies aimed at improving healthcare access, increasing quality, and controlling costs.

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See also American Health Planning Association (AHPA); Cost of Healthcare; Health Planning; Health Systems Agencies (HSAs); Hospitals; Public Policy; Regulation; Roemer, Milton I.

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- National Conference of State Legislators (NCSL):
<http://www.ncsl.org>

CHARITY CARE

Charity care may be generally defined as the financially quantifiable costs of activities, services, or programs that a hospital provides for individuals and for which the hospital does not expect to be compensated, whether fully or in part. This entry examines the role of charity care for non-profit hospitals, as compared with their for-profit counterparts, the expectations, approaches, and measurement of charity care, and the legal ramifications and policy implications of charity care.

Background

During the 1980s, a period of rapidly escalating healthcare costs and changes in third-party reimbursement, nonprofit hospitals in the United States adopted a number of different strategies to reduce costs and increase revenues. Hospitals sought to increase operating or profit margins. Rather than being praised for adopting a business-like approach, however, nonprofit hospitals drew criticism for abandoning their not-for-profit charitable missions. For reasons related to the perceptions that nonprofit hospitals were focused more on profit and less on charitable services, and pressure by local governments to find new revenue sources, the concept of charity care became the operative construct in the ensuing policy debate; nonprofit facilities, which benefit from local, state, and federal tax exemptions, are expected to provide a certain level of charity care through

contributions and services made available to their local communities. If these hospitals do not offer charitable, non-revenue-generating services, should they keep their nonprofit status?

Changes in the Public's Perception

Five factors largely accounted for the change in the public's perception of the charity mission of nonprofit hospitals and the resulting quid pro quo between levels of charity care and a nonprofit hospital's tax-exempt status. These factors are the following: (1) the distancing of local hospitals from their locally supportive communities, which resulted in the erosion of credibility and trust; (2) the movement toward greater efficiencies through the elimination of loss leader services; (3) charges of unfair competition; (4) research finding few differences between nonprofit and for-profit healthcare providers; and (5) the search for new revenue sources by financially strapped municipalities. Each of these factors is discussed below in more detail.

Distancing From Local Communities

Whether hoping to realize financial efficiencies or facing the prospect of closing, many single community-based nonprofit hospitals were absorbed into large multihospital healthcare systems. Subsequently, some hospitals with long and distinguished histories of service to their local communities not only lost their identities but also traded their links to the very communities that had supported and governed them. Instead, they were now managed by entities that were geographically distant and had anonymous corporate accountability and control. Having lost ties to their local communities, these hospitals began to suffer an erosion of credibility and trust. Distance and mistrust made nonprofit hospitals easier targets for those who questioned their charitable ethos when the move to efficiency seemed to supplant charitable services.

Movement Toward Efficiency

Whether as members of large multihospital healthcare systems or as stand-alone healthcare facilities, many nonprofit hospitals tried to realize

financial efficiencies by eliminating services that were deemed loss leaders or unable to make revenues. Some of these services, such as trauma centers, burn units, and maternity units, were often high profile and attracted large numbers of people who could not pay for primary or emergent healthcare services. Public perceptions, articulated by legislators, jurists, and for-profit hospital competitors, turned sour. In their efforts to generate revenue and serve as a business, nonprofit hospitals were seen as renegeing on their charitable mission to the community and foisting additional healthcare costs for the medically indigent on already financially strapped communities.

Charges of Unfair Competition

Owners of for-profit hospitals, also suffering from rapidly escalating healthcare costs, began to question the competitive advantage nonprofit hospitals received through their exemption from a variety of local, state, and federal taxes; for-profit hospitals have to pay these taxes. Further supporting this contention were local business people who claimed that they were suffering from unfair competition from untaxed nonprofit hospitals that were trying to raise new revenues by running for-profit services such as gift shops, health clubs, and laundries that already existed in the community as for-profit enterprises.

Research Finding Few Differences

Attracted by contentions that there were few or no substantial differences between nonprofit and for-profit hospitals, health services research that examined differences between nonprofit, for-profit, and public organizations increased. During the 1980s, empirical research comparing nonprofit and for-profit hospitals was inconclusive, largely due to measurement issues. These studies found no significant differences between the two types of hospitals in areas such as levels of uncompensated care, percentages of uninsured patients served, percentages of Medicare and Medicaid patients, and the range of often unprofitable services being offered to the medically indigent. There were, however, sufficient data from reputable researchers to create doubts about the amount of charity care nonprofit hospitals were providing. This research

spurred ongoing debates about the competitive tax status of nonprofit hospitals and the expectation of charity care.

Search for New Revenue Sources

At this time, many local municipalities were encountering significant funding shortages. The federal government was withdrawing revenue-sharing funds that once supplemented funding for local projects and programs, and local legislators were also imposing caps on property and sales taxes. Many local government officials seized on the idea of generating new revenues by rolling back the generous property tax exemptions that they traditionally accorded nonprofit organizations. These officials were facing a sluggish economy and diminished federal support, and they recognized a growing lack of trust between nonprofit hospitals and the business community. As a result, they required a certain level of charity care to qualify for property tax exemptions. Nonprofit hospitals, they argued, should no longer be able to siphon off local services if they were unable to meet their charitable responsibilities to a community that privileged them with tax exemptions.

Charity Care and the Nonprofit Tax Exemption

The 1980s brought a level of public scrutiny and criticism heretofore unknown to nonprofit hospitals. Even as they evinced financial stewardship, they were criticized for becoming too businesslike at the expense of providing charity care for those who could not afford it. Local, state, and federal governments treat nonprofit hospitals differently from for-profit hospitals and other proprietary enterprises, especially in terms of tax exemption; but are nonprofit hospitals able to justify their exemptions from a variety of taxes by making sufficient contributions of charity care to their local communities?

Such scrutiny was primarily academic until 1985, when the Utah Supreme Court moved the issue from theoretical bantering to the level of law and precedent. It denied property tax exemption to two nonprofit hospitals in the Intermountain Health Care System. Specifically, the Utah Supreme

Court established a six-part test that the local tax board could use to determine whether nonprofit hospitals made charitable contributions to the community sufficient to make them eligible for tax exemptions. In addition to examining the distinctions between nonprofit and for-profit hospitals, the extent to which the two hospitals involved were supported by donations and gifts, the profit derived from operation, the charges levied on patients, and several other factors before concluding that the hospitals did not qualify as charitable institutions, the court also examined the type and scope of charity care nonprofit hospitals provided. It looked at whether nonprofit hospitals offered services at charges below the current market rate or through a substantial imbalance in the exchange between what it costs the charity and what it costs the recipient of its services or in the lessening of a government's burden through the charity's operation. This case sought to determine if these hospitals made unremunerated contributions to the community.

Lacking evidence of providing unremunerated contributions to the healthcare of the local community, the Utah Supreme Court allowed Utah County to withdraw the tax exemptions of the two hospitals. Evidence of providing charity care was key to this newly established *quid pro quo*.

In addition to this state judicial decision, federal legislators also flirted with federal income tax exemption strategies to compel nonprofit hospitals to do more for the poor and uninsured. Concerned about the enormous revenues many nonprofit hospitals were realizing in the mid-1980s during the early days of Medicare's prospective payment system (PPS), two U.S. representatives proposed legislation in 1991 to require nonprofit hospitals to provide more charity care in return for their federal income tax exemptions. This legislation was subsequently withdrawn. Although most of the policy debates about charity care and the nonprofit hospital tax exemption are at the state and local levels, this legislation, at least for a time, gave the issue national prominence.

In 2002, the tax exemption issue reverted back to the states, only this time in Illinois. In a precedent-setting ruling by the Illinois Department of Revenue, Provena Covenant Medical Center of Urbana, part of the Provena Health System, a large Catholic health organization, was stripped of its

Champaign County property tax exemption. In a decision later upheld by the state, and having national implications, the director of the Illinois Department of Revenue ruled that the hospital was providing insufficient charity care to needy people. Since 2003, the Provena Covenant hospital has paid more than \$6 million in property taxes.

In 2006, the Illinois Attorney General proposed the Tax-Exempt Hospital Responsibility Act, which would mandate Illinois nonprofit hospitals to invest at least 8% of total operating costs toward medically necessary care for uninsured Illinois residents with incomes below certain poverty levels. The care provided would be entirely free of charge or discounted. Such investments cannot be based on foregone revenues from charges but rather on costs calculated as those measured by a hospital's Medicare cost-to-charge ratio. Proposed sanctions for noncompliance would include the revocation of tax exemption and monetary penalties. As of 2008, however, no such law has been passed.

Nonprofit Hospitals' Defense of Their Charity Care Activity

These mandates and court decisions created threats to nonprofit hospitals that potentially impacted the financial situation of all tax-exempt organizations. In response, the hospitals took historical, organizational, and operational approaches to argue that they provided charity care to the community. Each approach is discussed below.

Historical Approach

Nonprofit hospitals argued that since they were founded, they were always engaged in charity care by serving the poor and the medically indigent. For example, the ill who were wealthy, at least in their earliest days, were cared for in their homes. Those individuals who lacked access to healthcare services, because of poverty, geography, or ethnic, racial, or religious discrimination, found free or subsidized care in nonprofit hospitals, whose charitable activities were supported through goodwill and local philanthropy. Using this rationale, nonprofit hospitals clearly provided charity care by serving those who could not pay at the time of their founding.

This type of charity care argument was easier to make, however, when philanthropic activity was more obvious in the fund-raising activities of members of the community. When private insurers and state and federal governments began to take a more active role in paying for and providing healthcare services, first through the Hill-Burton legislation in 1946, then through Medicare Prospective Payment in 1983, and later through Medicare and Medicaid contractual reimbursements, nonprofit hospitals began to rely more on third-party reimbursement and less on local philanthropy. Lacking such community philanthropy, nonprofit hospitals had a difficult case, ensuring that their activities were something other than maximizing revenues or selling services to people with diminishing abilities to pay.

Organizational Approach

From an organizational perspective, nonprofit hospitals argued that they were charitable through state laws of incorporation. Because they were organized to be "not-for-profit," they did not maximize profit to distribute to individual shareholders. Rather, they were required to return any excess of revenue over expenses—any "profit"—to their hospitals to provide new, better, or below-costs services to the community. Such an organizational structure, they argued, made them inherently charitable. The charitable returns they made to their hospitals, however, were asserted and not measured. Those skeptical of the activities of nonprofit hospitals began to insist on proof.

Operational Approach

Increased skepticism about a nonprofit's organizational test directed attention to the operational test in Section 501(c)(3) of the Internal Revenue Code. This section of the Internal Revenue Code, which grants tax exemption to nonprofit organizations, states that nonprofit corporations seeking tax exemptions cannot simply assert adherence to the organizational test or "non-distribution constraint," where no "part of the net earnings inures to the benefit of any private shareholder or individual." Rather, they must also be operated exclusively for charitable purposes.

Although the Internal Revenue Code does not define *charitable* specifically, a 1956 Revenue Ruling recognized the expression of a hospital's charitable purpose in "the extent of its financial ability for those not able to pay for services rendered." By 1969, however, the Internal Revenue Service (IRS) had modified this ruling and eliminated the requirement that nonprofit hospitals provide free or subsidized care.

With the advent of the Utah case, and more recently the Provena Covenant ruling, and with changes in the nation's political and economic climate, nonprofit hospitals could no longer rely on history or organizational or operational forms as arguments for or indicators of charity care. Rather, they have to begin to measure their charity care levels in order to justify ongoing favorable tax treatment.

Measuring Charity Care

Despite being a definition that relies on quantifiable costs, an operational construct of charity care is nevertheless problematic because the cost component of charity care is difficult to measure and because there is disagreement over the types of costs that should be included in measures of charity care.

A charity care definition that depends on costs, or that counts "foregone revenues" as a proxy for measuring the costs of charity care, may over- or understate charity care contributions. Despite the advent of Diagnosis Related Groups (DRGs) and better information technology, individual hospital patient costs are still difficult to calculate. Moreover, to rely on foregone revenues as proxies for measures of costs is really to rely on foregone charges. While charges are easier to measure, they are typically higher than costs because of markups. Thus, any charity care measure that depends on charges or on deductions from revenue rather than actual costs expenses would actually favor hospitals with higher markups. And hospitals with higher markups do not necessarily make larger contributions of charity care.

Despite the difficulty of calculating costs, there is still little consensus about the types of uncompensated costs that should be included in an operational measure of charity care. Some argue that a

measure of charity care should be pure, one that is based on only the upfront write-offs of care. Others maintain that a measure of charity care should include bad debts: They consider that most bad debts are really charges that the medically indigent cannot pay and that should have been, but were not, written off before service was rendered. Additionally, consideration should be given to whether to include the shortfall from Medicare and Medicaid in an operational definition of *charity care*. Such distinctions are germane, especially for those trying to justify the nonprofit tax exemption, because the picture of a hospital's charity care contributions improves dramatically—especially if measures include unreimbursed contractuals—depending on the types of costs that are included in the operational definition of *charity care*.

Pure Charity Care

The most restrictive and the easiest to quantify form of charity care, pure charity care, is not one typically advocated by healthcare providers but by governments. Attorney generals, for example, challenge that nonprofit hospitals are providing insufficient charity care when, as a charity care measure, they calculate the prior to service write-offs of all charges to patients whom a hospital has classified as being unable to pay. These write-offs, whether they are for all or part of the bill, constitute pure charity care.

Uncompensated Charity Care

Uncompensated charity care includes both pure charity care and the costs of bad debts. Bad debts are the charges for services that a hospital tries to collect from a patient but cannot. Prior to rendering services, a hospital presumes such patients are able to pay, but they do not. Because it includes a bad-debt component and reflects foregone charges rather than costs, economists, legislators, and policy analysts usually reject uncompensated care charity care measures. While uncollected debt may be construed as a reflection of poor management practices and inefficiencies, there is some evidence to suggest that some part of a bad debt may actually be charity care provided to indigent people who were below 150% of the federal poverty level. Thus, it is not clear whether including a bad-debt component in

measures of charity care actually inflates or understates a hospital's charity care contributions. Nevertheless, including bad debt as charity care does not promote good management practices.

Unreimbursed Charity Care

Measured as the sum of foregone charges of pure charity care and Medicare and Medicaid contractual allowances and shortfalls, unreimbursed charity care reflects the differences between what a hospital charges to provide a service and the rate at which the federal or state government reimburses a hospital for its services. Hospital administrators argue that the government reimburses for Medicare and Medicaid programs at substantially lower rates than what it costs to provide service, and believe that any charity care measure that does not reflect these allowances severely understate the real value of the contribution a hospital makes to society for care of the poor. In addition, they argue, such shortfalls must be made up from other revenue sources, a strategy that pushes costs on to insured patients.

Total Charity Care

The most inclusive of all measures of charity care, total charity care, includes pure charity care, bad debt, and Medicare and Medicaid contractual shortfalls. While it is the most robust, this measure can be criticized for all the reasons for which its individual components can be criticized.

Importance of a Common and Operational Definition

As the courts and legislators become more assertive in linking a hospital's nonprofit tax exemption with the level of charity care it produces, the need to measure charity care becomes more important. It does not, however, become less complex. It is easier to define charity care than to measure it. Nonprofit hospitals can make a stronger case for a tax-exempt status if courts and legislators accept more inclusive operational measures of charity care. Of all components, however, Medicare and Medicaid contractual shortfalls have the most dramatic effect on the charity care measure.

Future Implications

Proposed changes in tax exemption policy based on measures of charity care could include tying amounts of tax exemption subsidy to levels of charity care, totally revoking the nonprofit tax exemption, or targeting individual hospitals, as seems to be the current practice. Depending on the rates of subsidy, tying levels of the tax exemption subsidy to outputs of charity care is a strong incentive for nonprofit hospitals to increase their production of charity care. The complete revocation of current tax exemption policy, however, is clearly a disincentive to the production of charity. Moreover, such a policy may actually increase the financial distress of hospitals that serve large numbers of poor, underinsured, or uninsured patients or high percentages of people whose healthcare comes through Medicare or Medicaid. The current policy trend of a quid pro quo of tax exemptions for charity care suggests that both the definition of charity care and the operational components needed to measure it will, in importance, supplant prior arguments based on the historical activities of nonprofit hospitals or any IRS ruling based on organizational and operational tests.

Susan M. Sanders

See also Cost of Healthcare; For-Profit Versus Not-For-Profit Healthcare; Healthcare Financial Management; Hospitals; Public Policy; Safety Net; Uncompensated Healthcare; Uninsured Individuals

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- National Council of Nonprofit Associations (NCNA):
<http://www.ncna.org>

CHASSIN, MARK R.

Mark R. Chassin is a national leader in healthcare quality, patient safety, and public policy. In 2008, he became the president of the Joint Commission, the nation's leading accrediting body in the United States.

Born in Brooklyn and reared in New York City and Long Island, Chassin earned his bachelor's degree and a medical degree from Harvard University. He went on to earn a master's degree in public policy from the Kennedy School of Government at Harvard, and a master's degree in public health from University of California, Los Angeles. He is also a board-certified internist.

Prior to joining the Joint Commission, Chassin was the Edmond A. Guggenheim Professor of Health Policy and the chairman of the Department of Health Policy at the Mount Sinai School of Medicine in New York. Chassin also was the Executive Vice President for Excellence in Patient Care at the Mount Sinai Medical Center. During his 12 years at Mount Sinai, he led an initiative to achieve excellence in all aspects of patient care including patient safety, clinical outcomes, the experiences of patients and their families, and the working environment of caregivers. In addition, he

successfully implemented Six Sigma quality-improvement methods at the hospital and medical school. His research at Mount Sinai focused on developing healthcare measures, using those measures to improve quality, and understanding the relationship of quality measurement and improvement to health policy. He also expanded intervention trials to reduce racial and ethnic disparities in healthcare.

Before joining the faculty at Mount Sinai, Chassin served as the commissioner of the New York State Department of Health from 1992 to 1994 under Governor Mario M. Cuomo. From 1988 to 1992, he was the senior vice president and cofounder of Value Health Sciences, Inc., a Santa Monica, California, private-sector company that developed computer software and systems for quality assessment and utilization review. Prior to that, he worked as a senior project director at RAND Corporation, where he led several major health services research studies on the inappropriate use of various medical and surgical procedures. From 1979 to 1981, he served as the deputy director and medical director of the Office of Professional Standards Review Organizations at the federal Health Care Financing Administration (HCFA) (now the Centers for Medicare and Medicaid Services [CMS]). At HCFA, he oversaw the development and application of federal guidelines for determining which medical procedures were inappropriate for treating Medicare patients. Before working at HCFA, Chassin practiced emergency medicine in California.

Chassin has received many awards and honors recognizing his contributions to the fields of quality measurement and improvement. He is a member of the National Academy of Sciences, Institute of Medicine (IOM). In 2001, he was selected in the first group of honorees as a lifetime member of the National Associates of the National Academies, a program of the National Academy of Sciences recognizing career contributions to the National Academies. He is the recipient of the Founders' Award of the American College of Medical Quality, and the Ellwood Individual Award from the Foundation for Accountability. He has also served as a member of the Board of Directors of the National Committee for Quality Assurance (NCQA) and AcademyHealth.

Amie Lulinski Norris

See also Accreditation; Health Report Cards; Joint Commission; Medical Errors; O'Leary, Dennis S.; Patient Safety; Quality of Healthcare; RAND Corporation

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CHILD CARE

Some health services researchers examine the impact of access, cost, financing, quality, and the organization of child care on the health and medical outcomes of children. Child care consists of various care services and the education provided to children from birth to age 12. Child care can be licensed or unlicensed care. Licensed care consists of programs that meet their state government's minimum standards for health, safety, and quality. It can also be accredited by professional education associations for meeting standards of quality, and its workforce is credentialed. Those programs that do not require a license within their state are typically the paid care provided by family members, friends, and neighbors.

Background

According to the U.S. Census Bureau's Survey of Income and Program Participation of 1999, among the nation's 12.2 million children aged 5 and younger with employed mothers, 60% were in a child care arrangement with someone other than a parent. The 22 million children of age 6 to 14 with an employed mother spent an average of 22 hours per week in the care of someone other than their parents before or after school.

The same survey also found that for children 4 to 35 months of age, about 55% had mothers who were employed either part-time or full-time. About 61% of the children spent time in child care. About 38% of the children whose mothers were employed full-time spent 21 to 40 hours in child care. In contrast, children whose mothers were not employed often spent no time in child care (59%).

In 2003, 20% of all children in the nation below the age of 6 (4.7 million children) were living in poverty. In low-income families, there is a demand for child care but with limited child care facilities. Opportunities are limited for care for school-age children and adolescents. The existing range of after-school programs and activities meets only 20% of the potential demand in urban areas.

Child Care Settings

Child care offers developmental care and education for children who live at home with a parent or guardian. There are a variety of child care settings. The National Health and Safety Performance Standards, set by the American Academy of Pediatrics (AAP) and other organizations in 2002, define several types of facilities offering child care. Family Child Care Homes provide care and education in a residence that is usually, but not necessarily, the home of the caregiver. A Small Home cares for up to 6 children at one time, and a Large Home cares for 7 to 12 children at a time, including the preschool children of the caregiver. *Center-based care* refers to a facility that provides care and education to any number of children in a non-residential setting. Centers include Head Start and Early Head Start programs. A center provides care for some children for more than 30 days per year per child, which may include summer camps.

A drop-in facility provides care for fewer than 30 days per year per child on a consecutive or intermittent basis. A school-age child care facility offers activities to children before and after school, during vacations, and on nonschool days when there are teachers' in-service programs. A facility for children with special needs provides specialized care and education for children who must be accommodated in a setting with a smaller staff-child ratio, such as for children with disabilities or certain chronic illnesses. A facility for ill children provides care for 1 or more children who are temporarily excluded from care in their regular child care setting. Facilities for ill children can serve up to 6 children and be integrated in a licensed facility for well children, or they can be a special facility for ill children that cares for only ill children or for more than 6 ill children at a time. The National Health and Safety Performance Standards recommend facilities serving birth to 12 months have a child-to-staff ratio of 3 children to 1 staff member, with a maximum group size of 6 children; for children 13 to 30 months old, the recommended ratio is 4 to 1; for children 31 to 35 months old, it is 5 to 1. As children get older, the child-to-staff ratio can grow. For example, for 3-year-olds, the ratio is 7 children to 1 staff member. For 4- to 5-year-olds, it increases to 6 to 1. The recommendations suggest a child-to-staff ratio of 10 children to 1 caregiver for 6- to 8-year-olds. For 9- to 12-year-olds, the recommended ratio is 12 to 1. Ratios for facilities serving children with special health needs are significantly smaller.

During the summer, almost 30% of school-age children are in at least one child care arrangement that can be defined as an organized program (a summer program, summer school, or a before and/or after school program). According to the Urban Institute's National Survey of America's Families for 2002, 34% of children are in relative care during the summer. The remainder is in patent care. Low-income parents spend 14% of their income during the school year for child care.

Separate from state-regulated child care sites, the U.S. Department of Defense (DoD) has developed high-quality child care programs for military personnel at 800 sites worldwide. They have a comprehensive system of child care options with accountability, oversight, and mandates for accreditation, staff training and professional

development, staff wage enhancements, and parent involvement.

Child Care Policy

Though there is the National Health and Safety Performance Standards, child care is regulated at the state government level. States typically have a statute that identifies the regulatory agency and mandates the licensing and regulation of all full-time and part-time out-of-home care for children, regardless of the setting of child care. States establish regulations for child care settings and monitor compliance with those regulations. The primary goal of state licensing is to ensure basic health and safety protection for the child and child care workers. In addition, local and state public health departments have the legal responsibility to control communicable diseases in their jurisdictions.

Child Health Issues in Child Care Settings

An effective health intervention at a child care site should address nutrition services, mental health, access to health services, quality of child care services, and systems of care.

Nutrition Services

Most child care sites provide nutritional services. The National Health and Safety Performance Standards used by state licensing agencies specify guidelines for the implementation of nutrition standards to provide high-quality meals, and nutrition education programs. Two major federal nutritional programs are available to children in child care settings. The Child and Adult Care Food Program (CACFP) is a federal subsidy for meals, snacks, and nutrition education in licensed child care centers, and family and group day care homes. The program primarily serves children whose income falls below 185% of the federal poverty level. The program, administered by the U.S. Department of Agriculture (USDA), serves more than 2 million children nationally. The department also administers the Summer Food Service Program (SFSP), which is intended to serve school-age children nutritious meals at child care sites in the summer, when they do not have access to the National

School Lunch or School Breakfast Program. Individual states also may have nutrition services funding child care sites.

Mental Health

The Comprehensive Community Mental Health Services for Children and Their Families is a federal program that child care sites can use in their referral and mental health consultation to staff. The Center for Mental Health Services, Substance Abuse and Mental Health Services Administration (SAMHSA), under the U.S. Department of Health and Human Services (HHS), funds 40 comprehensive mental health systems of care throughout the nation. The Head Start program has child mental health guidelines and has established regional Technical Assistance Centers that provide consultation to Head Start Centers on mental health issues facing children and their families.

Access to Health Services

Some child care programs such as Head Start have an integrated health service access and delivery approach. Head Start Centers often partner with local child healthcare systems to provide dental services, health screening and pediatric care, and nutrition services.

Quality of Child Care Services

Quality care requires lower child-staff ratios, smaller group sizes, and developmentally appropriate activities, as well as well-trained staff to prevent the spread of infectious diseases, provide a safe environment, and provide for safe evacuation and management of emergency situations.

Quality care provides health promotion and child protection, including hygiene, sanitation, disinfection maintenance, child and staff health protection, accommodation of special medical conditions in young children, and management of illness. Quality child care settings offer nutrition education to the child and family and a nutritious food service. They also focus on the prevention and management of infectious diseases. They are settings that are sensitive to the cultural and ecological

contexts that affect early child care for ethnic minority families, including their healthcare.

Children in child care arrangements with other children experience more bouts of upper-respiratory tract illnesses between the ages of 36 months and 54 months than do those not in child care settings. Therefore, centers have developed plans for care or exclusion of the sick child. These centers have been developed to care for the sick child, allowing working parents fewer missed days of work due to a child's illness.

Systems of Care

The quality child care programs provide are linked to the local systems of healthcare, including dental services and oral health education for the child and family, and linkages with healthcare providers who offer immunizations, health screening, and preventive pediatric care and nutrition services for the child and family. There are partnerships with healthcare professionals, mental health professionals, and community social service agencies.

The Child Care Workforce

A study by the Early Child Care Research Network of the National Institute of Child Health and Human Development (NICHD) in 2002 found that regulations regarding staff training and staff-child ratios affect the quality in child care settings and ultimately child outcomes.

The National Health and Safety Performance Standards recommend that any individual with primary responsibility for child care have an official child care credential as granted by the authorized state agency. Among the standards for credentials are those of the National Association for the Education of Young Children (NAEYC) and the Child Development Associate (CDA). The national standards recommend that staff should receive ongoing training in health, psychosocial and safety issues, including information on the spread of communicable diseases and their prevention, immunization requirements for children and staff, and the management of common childhood illness, including exclusion policies. In addition, caregivers are trained in infection control and injury prevention, emergency procedures, management of a blocked

airway, rescue breathing, and other first aid procedures. Caregivers learn nutrition, medication administration policies and practices, behavior management, and how to recognize and report child abuse in compliance with state laws.

Health advocates in child care facilities, usually one of the caregivers on-site, are the primary parent contacts for health concerns, including health-related information and the provision of resources. The National Health and Safety Performance Standards recommend that the health advocate refer children without a regular source of care to a healthcare provider who offers competent routine child care services. In addition to the on-site health advocate, each center should have a health consultant who is a health professional with training and experience and expertise in child health and development. This person should be knowledgeable about the special health and safety needs of children in out-of-home care settings, the child care licensing requirements, and available health resources. Sites should have registered nurses available on-site to provide medical treatment, staff training, and ongoing supervision of the health needs and practices of staff and children, which ensures appropriate administration of health education and prescribed medical treatment.

Facilities serving children with disabilities need the off-site availability of a variety of healthcare professionals, including a physician, registered dietitian, registered nurse, psychologist, physical therapist, occupational therapist, speech pathologist, and respiratory therapist.

Caregiver training in health and safety practices, including injury prevention, infection control, and health promotion, needs to be ongoing. The CDA credential includes training in five areas: (1) the recommended immunization schedule, (2) reporting of communicable diseases, (3) techniques, (4) emergency medical services, and (5) emergency preparedness for disaster. The National Health and Safety Performance Standards recommend caregiver training in health and safety practice, including injury prevention, infection control, and health promotion. Caregivers should also receive training in cultural diversity; nutrition and healthy eating; the protocol to prevent, recognize, and correct health and safety problems; and management of illness.

Child Health Outcomes

When looking at child care centers and services, child health outcomes should be considered in terms of general outcomes, economic impact, and access to healthcare.

General Outcomes

According to studies conducted by the NICHD, children have better school readiness and language comprehension and fewer behavior problems at 36 months of age when they attended quality child care that met recommended child-staff ratios and recommended levels of caregiver training and education. According to the NICHD's Study of Early Child Care, a 10-site prospective study of more than 1,100 participants that began at birth, in addition to education and developmentally appropriate activities, sites with positive child outcomes had programs promoting and protecting children's health and controlling infectious diseases, ensuring children's nutritional well-being, and maintaining a healthy environment. Within the sample, when only poor or near-poor children were in care for at least 20 hours a week, a higher quality of care was found to be associated with more favorable developmental outcomes in the children.

Economic Impact

In another study conducted by NICHD (the Study of Early Child Care and Youth Development) using a stratified random sample of more than 1,300 children and their families from birth through first grade, researchers found that the total number of hours in child care was associated with higher maternal wages and more hours of employment when children were in first grade. There was also a reduction in the number of parent's missed days of work, industry's lost productivity, and employee absenteeism. A study by the Federal Reserve Board in Minneapolis, Minnesota, estimated that high-quality early-childhood programs could yield a 12% rate of economic return to the public and a 4% rate of return to the individual child and his or her family. To deliver this rate of return, the child care program must meet high standards of quality, which some researchers feel can be achieved through more private outlay and public investment.

Access to Healthcare

As discussed earlier, the National Health and Safety Standards recommend that the child care facility help families who have no regular health-care provider locate a resource that can meet their needs. Referral to health services should be comprehensive and range from preventive services such as immunizations, injury prevention, and nutrition, to acute treatments to referral and evaluation for potential chronic health problems. Child care centers can serve as a linkage of families to the healthcare system, and providers can assist families in obtaining information about their child's eligibility for the State Children's Health Insurance Program (SCHIP). Additionally, they can help families access a medical home and establish a regular source of care. Linkage and referral to child care resource center, county public health departments, Early, Periodic, Diagnosis, and Treatment (EPSDT) programs, and hospital and clinic pediatric departments are among the health service use outcomes.

Future Implications

Child care is vital for families, industry, and society. It affects education, childhood development, and pediatric health. In terms of health services research, there is a need for research on the benefit-to-cost ratio of preschool health services, immunizations, health screenings, and preventive care on child health status indicators. Further research is also needed on the effects of the child health standards for children with developmental delays or chronic health problems.

Health service researchers will need to focus on effective treatments and best practices that effectively address poor nutrition, infections, and exposure to environmental toxins, drugs, and other biological hazards that affect healthy brain development. More studies with using experimental and quasi-experimental designs will help establish best practices for integrating child healthcare and child care systems.

In terms of state and federal policy, quality programs must ensure that all child care settings are safe, stimulating, and compatible with developmental needs. These settings need to be made more accessible to larger numbers of the working poor

for whom the benefits are substantial. Finally, public policies that address the financing and investment in child care by government and the private sector need to be developed, proposed, and implemented.

Sharon Telleen

See also Access to Healthcare; American Academy of Pediatrics (AAP); Health Insurance; Medicaid; Preventive Care; Primary Care; State Children's Health Insurance Program (SCHIP); Vulnerable Populations

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 U.S. Census Bureau: <http://www.census.gov>

CHIROPRACTORS

Chiropractic is America's most popular form of alternative healthcare, and more than 25 million patients annually visit chiropractors for pain relief and other benefits. Chiropractic is a healthcare profession that focuses on disorders of the musculoskeletal system and the nervous system and the effects of these disorders on general health. Chiropractic care is used most often to treat neuromusculoskeletal complaints, including but not limited to back pain, neck pain, pain in the joints of the arms and legs, and headaches.

Doctors of chiropractic—often referred to as chiropractors or chiropractic physicians—practice a drug-free, hands-on approach to healthcare that includes patient examination, diagnosis, and treatment. Chiropractors have broad diagnostic skills and are also trained to recommend therapeutic and rehabilitative exercises, as well as to provide nutritional, dietary, and lifestyle counseling.

Chiropractors are considered first-contact providers (i.e., primary-care providers) and are so defined in federal and state regulations, including within the Medicare program. For many conditions, such as lower-back pain, chiropractic care may be the primary method of treatment. When other health conditions exist, chiropractic care may complement or support medical treatment by relieving the musculoskeletal aspects associated with the condition.

Doctors of chiropractic may assess patients through clinical examination, laboratory testing, diagnostic imaging, and other diagnostic interventions to determine when chiropractic treatment is appropriate or when it is not appropriate. Chiropractors will readily refer patients to the

appropriate healthcare provider when chiropractic care is not suitable for the patient's condition or when the condition warrants comanagement in conjunction with other members of the healthcare team.

Philosophy

Doctors of chiropractic believe in a holistic “total person” approach to healing, which typifies the new and changing attitude toward health. It is based on the concept of “maintaining health” versus “treating disease.” Chiropractic philosophy includes (a) a recognition that dynamics exist between lifestyle, environment, and health; (b) understanding the cause of illness to eliminate it, rather than simply treat symptoms; (c) a recognition of the centrality of the nervous system and its intimate relationship with the capacities of the human body; (d) a patient-centered, hands-on approach focused on influencing function through structure; and (e) a focus on early intervention, emphasizing timely diagnosis and treatment of conditions that are wholly functional and reversible.

Treatment Methods

The most common therapeutic procedure performed by doctors of chiropractic is known as *spinal manipulation*, also called *chiropractic adjustment*. The purpose of manipulation is to restore joint mobility by manually applying a controlled force into joints that have become hypomobile—or restricted in their movement—as a result of a tissue injury. Tissue injury can be caused by a single traumatic event, such as improper lifting of a heavy object, or through repetitive stresses, such as sitting in an awkward position with poor spinal posture for an extended period of time. In either case, injured tissues undergo physical and chemical changes that can cause inflammation, pain, and diminished function for the sufferer. Manipulation, or adjustment of the affected joint and tissues, restores mobility, thereby alleviating pain and muscle tightness and allowing tissues to heal.

Chiropractic adjustment rarely causes discomfort. However, patients may sometimes experience mild soreness or aching following treatment (as

with some forms of exercise) that usually resolves within 12 to 48 hours.

Research

Throughout its history, the chiropractic profession has had the difficult task of justifying itself to the mainstream medical community. The chiropractic profession has undertaken an extensive amount of research to show that chiropractic provides effective treatment that is patient-focused, low-cost, low-risk, and noninvasive.

A 2007 study from the Chicago area found that patients visiting chiropractors who serve as primary-care providers have lower utilization costs and higher patient satisfaction levels than do patients treated by conventional medical physicians. Researchers found that over the course of the 7-year study, which was published in the *Journal of Manipulative and Physiological Therapeutics*, patients visiting chiropractors and other complementary and alternative medicine-oriented primary-care providers had 60% fewer hospitalizations, 62% fewer outpatient surgical cases, and 85% lower pharmaceutical costs when compared with total network HMO utilization rates and costs. The chiropractors and other complementary and alternative medicine doctors treated and managed cases ranging from upper-respiratory-tract infections and allergies to headaches, orthopedic, and other medical conditions.

A significant amount of evidence also shows that the use of chiropractic care for problems such as acute and chronic lower-back pain, neck pain, headaches, and many other neuromusculoskeletal conditions can be more effective and less costly than traditional medical care. Most recently, the report of a 2005 study in the *Journal of Manipulative and Physiological Therapeutics* concluded that chiropractic and medical care have comparable costs for treating low-back pain, with chiropractic producing better outcomes for chronic pain. In addition, the report of a 2003 study published in the medical journal *Spine* found that manual manipulation provides better short-term relief of chronic spinal pain than do a variety of medications.

A 2007 literature review in the *Journal of Manipulative and Physiological Therapeutics*

found “high-quality evidence” that patients with chronic neck pain showed significant pain-level improvements following spinal manipulation. No trial group was reported to remain unchanged, and all groups showed positive changes up to 12 weeks after treatment.

With regard to headaches, a report released in 2001 by researchers at the Duke University Evidence-Based Practice Center found that spinal manipulation resulted in almost immediate improvement for headaches that originate in the neck and had significantly fewer side effects and longer-lasting relief of tension-type headache compared with a commonly prescribed medication.

Although there have been some isolated media reports of stroke following chiropractic neck manipulation, the findings in the current research literature agree that adverse events such as stroke or stroke-like symptoms associated with cervical manipulation are extremely rare. For example, a medical review published in 2002 looked at 73 studies of chiropractic care and found no serious complications reported in any of them. Studies have also shown that when an adverse reaction does occur, it is often the result of an improperly trained person performing the procedure—rather than a doctor of chiropractic.

Origins and History

The word *chiropractic* comes from the Greek words *cheir* (meaning “hard”) and *praktos* (meaning “done”)—that is, *done by hand*. The developer of chiropractic, Daniel David Palmer (1845–1913), chose the name.

A prolific reader of all things scientific, Palmer realized that although various forms of manipulation had been used for thousands of years, no one had developed a philosophical or scientific rationale to explain their effects. Palmer’s major contribution to the health field was the codification of the philosophy, art, and science of chiropractic, which was based on his extensive study of anatomy and physiology. Palmer performed the initial chiropractic adjustment in 1895. Palmer examined a janitor who had become deaf 17 years earlier after he felt something “give” in his back. Palmer examined the area and gave a crude “adjustment” to what was felt to be a misplaced vertebra in the

upper back. The janitor then observed that his hearing improved.

From that first adjustment, Palmer continued to develop chiropractic and in 1897 established the Palmer School of Cure, now known as the Palmer College of Chiropractic in Davenport, Iowa, where it remains today. Following the first adjustment, many people became interested in Palmer's new science and healing art. Among his early students were Palmer's son, Bartlett Joshua Palmer, as well as members of the older healing arts of medicine and osteopathy.

Kansas was the first state to license chiropractors in 1913, and by 1931, 39 states had given chiropractors legal recognition. Today, there are more than 60,000 active chiropractic licenses in the United States. All 50 states, the District of Columbia, Puerto Rico, and the U.S. Virgin Islands officially recognize chiropractic as a healthcare profession. Many other countries also recognize and regulate chiropractic, including Canada, Mexico, Great Britain, Australia, Japan, and Switzerland.

Education, Licensing, and Regulation

Chiropractic education is much more regulated and extensive than most people appreciate. The Council on Chiropractic Education, an agency certified by the U.S. Department of Education, currently recognizes 15 chiropractic programs at 18 different locations.

The typical applicant at a chiropractic college has already acquired nearly 4 years of premedical undergraduate college education, including courses in biology, inorganic and organic chemistry, physics, psychology, and related laboratory work. Once accepted into an accredited chiropractic college, students receive an additional 4 or 5 academic years of professional study. Because of the hands-on nature of chiropractic, and the intricate adjusting techniques, a significant portion of time is spent in clinical training.

In total, the chiropractic curriculum includes a minimum of 4,200 hours of classroom, laboratory, and clinical experience. Compared with medical students, chiropractic students receive considerably less instruction in pharmacology and surgery; however, added emphasis is placed on biomechanics,

musculoskeletal function, and manual treatment methods.

In the United States, all aspects of chiropractic education must meet official accreditation standards, and a graduate must also complete state and national licensing board examinations before gaining the right to practice.

Furthermore, virtually all states have mandatory continuing education requirements for chiropractors to maintain or renew a license to practice. Chiropractic colleges frequently offer postgraduate continuing education programs in specialty fields ranging from sports injuries and occupational health to orthopedics and neurology. These programs allow chiropractors to specialize in a healthcare discipline or meet state relicensure requirements.

Institutional Recognition

The public's attitude toward chiropractic care has been instrumental to the profession's growth and acceptance into mainstream healthcare. A few notable examples of chiropractic integration into today's healthcare system include the chiropractic department at the National Naval Medical Center in Bethesda, Maryland, the successful Complementary and Alternative Medicine Center at the National Institutes of Health (NIH), and the doctors of chiropractic who work as consultants to the Office of the Attending Physician at the U.S. Capitol Building. Furthermore, the federal government has recognized the effectiveness and cost savings potential of chiropractic care by providing benefits to veterans, active-duty military personnel, and Medicare patients.

Insurance Coverage

Compared with complementary and alternative therapies as a whole (few of which are reimbursed), coverage of chiropractic by health insurance plans is extensive. As of 2002, more than 50% of HMOs, more than 75% of private health-care plans, and all state workers' compensation systems covered chiropractic treatment, although chiropractic trade organizations have seen other more anecdotal and informal reports that put the percentage of PPOs offering chiropractic care at around 90%.

Chiropractors can bill Medicare for select services and more than two dozen states cover chiropractic treatment under Medicaid. Chiropractic care is available to members of the armed forces at more than 40 military bases in the United States and is covered benefit for America's veterans at nearly 30 U.S. Veterans' Administration health facilities. Furthermore, the Internal Revenue Service (IRS) includes chiropractic services as a valid medical deduction.

Chiropractors in Practice

Doctors of chiropractic represent the third largest doctoral-level healthcare professionals in the United States, after medical physicians and dentists. Nearly 82% are in full-time practice, with the average chiropractor working between 40 to 52 hours per week. The majority (61%) of chiropractors work in an office in which they are the only doctor. Nearly one third (31%) share an office with one or more chiropractors, while the remaining doctors either work in a multidisciplinary setting or work in other office arrangements.

The Chiropractic Patient

The results of a 2005 survey conducted by the National Board of Chiropractic Examiners found that more than 35% of patients receiving chiropractic care were being treated for mid- or low-back problems and almost 20% were being treated for neck pain. More than half of those surveyed indicated that their symptoms were chronic. Conditions commonly treated by chiropractors included, but were not limited to, back pain, neck pain, headaches, sports injuries, motor vehicle accident injuries, and repetitive strains. Patients also sought treatment of pain associated with other conditions, such as arthritis.

Angela M. Kargus

See also Antitrust Law; Complementary and Alternative Medicine; Licensing; Medicare; National Institutes of Health (NIH); Pain; Physicians; Primary Care

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- National Board of Chiropractic Examination (NBCE):
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- National Center for Complementary and Alternative Medicine: <http://http://nccam.nih.gov>
- World Federation of Chiropractic (WFC):
<http://www.wfc.org>

CHRONIC CARE MODEL

The Chronic Care Model (CCM) is a proposal for reorganizing primary medical care to address

better the needs of patients with chronic illnesses. This proposal creates a new clinical paradigm for delivering chronic disease care, with a major emphasis on patient self-management and secondary prevention. The ideas behind the CCM were outlined in a series of landmark articles published in 2002 in the *Journal of the American Medical Association* that described a number of attempts to implement various aspects of the model in diverse healthcare delivery systems across the United States. The principles of the model were originally developed by Edward H. Wagner, from the Center for Health Studies at Group Health Cooperative of Puget Sound.

Background

During the 1970s and 1980s, with U.S. healthcare costs regularly doubling the rate of inflation, many proponents of reforming the nation's healthcare system turned to managed care. A centerpiece of healthcare expenditure increases during these decades, above and beyond the aging of the population, was the rapid increase in the "intensity" of care, particularly hospital care for older patients with chronic illnesses. Yet despite the increase in surgical procedures and hospital-based specialty care, health services researchers were simultaneously producing ample documentation of major quality problems in basic chronic disease care for all Americans.

Early policy responses included the original federal health maintenance organization (HMO) acts of 1973 and 1976, which aimed at the creation of large integrated healthcare delivery systems that combined hospital and outpatient care. Such systems offered financial incentives, such as capitation (a fixed fee per year) reimbursement for a defined population of enrolled patients, to emphasize preventive health maintenance and avoidance of preventable exacerbations of chronic diseases. Because about 10% of the sickest patients generate over two thirds of all healthcare costs, there is a major financial incentive for prepaid delivery systems to better manage their highest-risk enrollees. It was hoped that capitated payment systems would initiate a new prevention and health promotion paradigm that could reverse the often perverse financial incentives of the fee-for-service system, which restricted

reimbursement to treatment of acute, urgent medical problems.

Although the HMO movement failed to transform the nation's healthcare, several large integrated systems, such as Group Health Cooperative, Kaiser-Permanente Northern California, and the Veterans Health Administration (VHA), did develop innovative disease management approaches to providing coordinated chronic disease care. These organizations were pioneers in adopting medical management information systems that could track utilization of care across multiple episodes of illness and provide computerized clinical guideline reminders and decision support to physicians. In addition, these organizations were able to offer multidisciplinary team-based care and proactive telephone follow-up of patients—services that are generally not reimbursed in traditional fee-for-service practice settings. It was from these successful experiments in redesign of primary care for chronically ill patients that Wagner and his colleagues distilled the CCM.

Basic Principles of the Model

The CCM was developed to capitalize on the best features of primary care, defined by the Institute of Medicine (IOM) as the provision of integrated, accessible healthcare services by clinicians who are accountable for addressing a large majority of personal healthcare needs, developing a sustained partnership with patients, and practicing within the context of family and community. The CCM seeks to go beyond managed-care gatekeeper models that attempt to reduce unnecessary care (and costs) by requiring specialty referrals from primary-care physicians. Instead, recognizing that most chronically ill patients receive the bulk of their care from primary-care physicians, and that the majority of them have multiple disease conditions, the CCM advocates efficient integration of specialty care into clinical case management while preserving a "whole"-patient perspective. Six synergistic "ingredients" of the model were distilled from evaluations of successful disease management and quality improvement efforts during the 1990s. Each is discussed below.

Clinical Information Systems and Disease Registries

Healthcare organizations that seek to improve care for a particular condition must first be able to identify patients with the condition as well as relevant aspects of their care. Chronic disease registries, which ideally should include diagnostic, laboratory, and pharmacy data, are thus essential to providing clinicians with information about all patients with a particular diagnosis (e.g., diabetes) in their practice. The registry is used to further determine whether relevant evidence-based tests and procedures have been performed (e.g., regular eye and foot examinations), to notify both patients and physicians when important exceptions to guidelines are identified or clinical services are overdue, or to identify very high-risk patients requiring intensified follow-up care. Registries provide an ongoing resource for quality improvement and continuous monitoring and evaluation of therapeutic progress (e.g., hemoglobin A1c laboratory results).

Despite the potential of health information technology to improve care, less than a half of even the largest physician group practices in the nation (those with greater than 20 physicians) had even a single chronic disease registry in 2001. Far fewer of these practices had registries linked to clinical data or that extended beyond a single condition such as diabetes. Obviously, smaller medical practices, which handle the majority of all physician visits in the nation, are even less likely to currently use chronic disease registries.

Support for Patient Self-Management

Central to the CCM is the concept of behavioral interventions in the way in which patients manage their illnesses on an everyday basis. This is conceptually distinct from shared decision making in clinical encounters between clinicians and patients, which focuses on treatment planning and collaborative decisions on medical management. Rather, self-management theory stresses the psychosocial aspects of coping with chronic illness and aims at both educating patients and improving patients' self-efficacy, or confidence in their ability and skills to undertake preventive measures to limit disease progression and symptom severity. Self-management initiatives thus

go beyond traditional didactic patient education to embrace strategies for patient empowerment. These strategies focus on individually tailored action plans that are capable of overcoming barriers to lifestyle changes, based on patients' existing health beliefs and readiness to make changes. Central to such behavior change is effective management of common psychological obstacles such as anxiety, fear, fatigue, and depression that so commonly afflict patients with incurable illness (and complicate successful medical treatment regimens). Self-management must therefore build on a patient's own goals and aspirations, with clinicians playing the role of coaches, providing feedback, and assisting in practical problem solving.

There is considerable evidence that differences in the efficacy of self-management may explain much of the widely observed socioeconomic and ethnic and racial disparities in health outcomes of patients with chronic illness. One of the greatest challenges to self-management educational initiatives is limited health literacy, including the ability to read and understand medical information. Given a general lack of fee-for-service reimbursement for psychosocial interventions, there remains a major deficit in funding for proven behavioral interventions such as smoking cessation, physical activity promotion, or weight loss.

Delivery System Redesign

The CCM calls for a redesign of the traditional physician office-based visit setting with its time limitations and focus on acute care. A basic concept is multidisciplinary, proactive team care, which can be conducted outside traditional physician office visits by allied health professionals. Nurses, case managers, health educators, and even nonclinician support personnel, working in conjunction with primary-care physicians, can be employed to schedule tests and visits, provide coaching, monitoring and education, conduct telephone (or Internet) follow-up, and update chronic disease registry information. Team members could also include pharmacists, psychologists, social workers, physical or occupational therapists, dietitians, or information system specialists. One noteworthy innovation is group visits, where patients who share a chronic illness can find mutual support, problem-solving help, and role models. In

theory, group visits can provide the type of social persuasion that characterizes effective interventions such as Alcoholics Anonymous or Weight Watchers. Other potentially useful innovations include home visits (e.g., by social workers following depressed patients), physician office open to advanced access to walk-in appointments, and “one-stop shopping” visits when patients can access a full range of specialized ancillary services such as foot or vision care in a single visit.

There are many obvious barriers to implementing these redesign features in smaller, fee-for-service physician office settings. One approach to encourage redesign has been pay-for-performance reimbursement incentives. Insurers (potentially including Medicaid and Medicare) may offer physician practices additional payments for meeting goals on “reportcard” measures that rate adherence to established clinical guidelines for chronic conditions across all patients cared for by a healthcare organization. This may spur more medical practices to pursue chronic disease redesign initiatives.

Accessing Community Resources

Community resources are critical in expanding the reach of physician office care. The CCM suggests developing ongoing linkages to community institutions such as mental health centers, senior citizen centers, hospital-based educational, smoking cessation or diet programs, exercise facilities, home health care agencies, and other community support institutions. An additional function of community resources might be assisting vulnerable or lower-income patients and their families with navigating the healthcare system or helping them find sources of health insurance, low-cost drugs, transportation, and child care or adult day care or respite care arrangements.

Medical Decision Support and Guidelines Implementation

The CCM calls for readily accessible clinical data to provide physicians and other providers with timely information and reminders, including point of care reminders of the need for indicated services at the time of patient visits. In this way, clinical guidelines and protocols can be implemented with minimum burden on physicians. Such

reminders can also be directly addressed to patients outside the physician’s office when appropriate. Registries can also be used to generate aggregate clinical performance feedback or report cards on panels of patients, displaying the percentage of each physician’s patients adhering to guidelines for their care, or providing information about clinical outcomes such as blood pressure control. Efforts such as “academic detailing” (university-based educational outreach) and specialized training and staff development programs for chronic care teams are also advocated. Finally, by flagging more severely ill patients or those who require additional medical resources, decision support may improve the efficiency of specialty care referrals.

Currently, decision support capabilities are limited by the paucity of medical practices that use electronic clinical records, particularly systems that are capable of interfacing laboratory and pharmacy prescription data. While computerized clinical records can potentially improve both patient outcomes and economic efficiency, there is a large initial investment required in hardware, software, and training. Finally, the validity and reliability of physician performance measures remains controversial, and physician or practice performance measures require adjustment for higher-risk patient populations.

Healthcare Organizational Leadership

Echoing continuous quality improvement theory, the CCM requires the enthusiastic endorsement of top-level healthcare leadership to be successful. Without top leaders supporting changes required by the CCM, traditional incentives for business as usual will undermine change efforts. CCM implementation requires significant reallocation of resources from the health system infrastructure, including information systems, use of multidisciplinary personnel in new roles, and incentives for clinicians to change their practice style to accommodate new approaches. Implementation of the model will often require a major shift in organizational culture, to proactive follow-up, emphasizing behavioral medicine, cooperative teamwork, and shared decision making with patients, skills that may conflict with traditional medical education as primarily experienced by physicians in the acute care hospital setting. It

is therefore not surprising that only about half of the largest medical practices in the nation reported using case management or performance feedback to physicians for any chronic illness.

Disease Management and the Chronic Care Model

Over the past decade, many of the functions of the CCM have been adopted by disease management firms, which primarily sell their services to large managed-care organizations, insurers, and health plans. The growth of the disease management industry has come in part as a response to the failure of managed care and the HMO movement to directly transform the healthcare delivery system through intrusive and unpopular restrictions on patient access and utilization review of physicians. Instead, large health plans hope to reduce costs by changing patient behavior outside the physician practice environment. The primary difference between the emerging disease management industry and the CCM is that educational and case management services are provided directly to patients by third-party firms contracting with the patient's insurer rather than being administered directly through the patient's medical practice.

The disease management industry began with pharmaceutical benefit and behavioral and mental health management firms that negotiated carve-out contracts with large health plans to manage care for specific populations of chronically ill patients. The industry has subsequently grown to include firms that provide many of the educational, self-management, and monitoring functions associated with the CCM. Disease management firms use sophisticated data warehouses containing claims and utilization data for millions of patients and, increasingly, specialized electronic home monitoring devices and patient self-assessments provided over the Internet. These data allow the firms to identify high-risk patients for a particular insurance entity and to then provide direct-to-patient services (usually by telephone) by specialized personnel such as nurse case managers, with or without the participation of physicians. These firms may also contact physicians directly when there is evidence of a divergence from practice guidelines or optimal care. While lacking the

intimate knowledge of patients and familiarity with local conditions that might characterize a primary-care practice, disease management firms have the resources to employ highly specialized and trained personnel who are fully dedicated to providing care management services. The future interaction of disease management and the CCM remains controversial and presents a potential financial conflict as disease management firms gain revenue that might otherwise be allocated to redesigning physician practices.

Future Implications

A number of meta-analyses have found that disease management and patient self-management programs have been generally successful in improving process quality of care and clinical outcomes for patients with chronic medical conditions. The best results have been reported for programs focused on care for diabetes, hypertension, asthma, and depression, with somewhat more contradictory results for congestive heart failure and arthritis. Data on whether self-management or case management reduces direct medical care costs remain mixed and inconclusive. There are also ongoing evaluations of attempts to implement components of the CCM through support for more than 100 demonstration projects from the Robert Wood Johnson Foundation (RWJF) and the Institute for Healthcare Improvement (IHI). These evaluations have generally been positive with regards to the fidelity of the model's principles, but the depth and extent of programs varied widely among participating provider organizations. Programs differ widely in what was done, the usual care that the control groups received, and the severity of illness of the study populations.

Because the studies to date cover only partially implemented aspects of disease management and never a full CCM implementation and because the literature may suffer from publication bias favoring successful programs, little is known about which specific aspects of self-management or case management programs actually produce the best results. This ambiguity about disease management and CCM outcomes has led to several calls for more standardized reporting of evaluations. As the nation's population ages and chronic illness

becomes more prevalent, the concepts behind the CCM will undoubtedly continue to shape health policy and delivery system innovation and will remain a central focus of health services research.

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See also Acute and Chronic Diseases; Case Management; Disease Management; Health Maintenance Organizations (HMOs); Long-Term Care; Managed Care; Primary Care; Quality of Healthcare

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<http://www.ihl.org>
- Robert Wood Johnson Foundation (RWJF):
<http://www.rwjf.org>

CHRONIC DISEASES

See Acute and Chronic Diseases

CLANCY, CAROLYN M.

Carolyn M. Clancy is a health services researcher and a general internist, and she is the director of the U.S. Department of Health and Human Services' Agency for Healthcare Quality and Research (AHRQ), the federal agency that is responsible for supporting research to improve healthcare quality, reduce healthcare costs, decrease medical errors, improve patient safety, and increase access to care. Clancy served as acting director of AHRQ from March 2002 until she was appointed director in February 2003. She previously directed the Center for Outcomes and Effectiveness Research, which conducts and supports research on the outcomes and effectiveness of healthcare services and procedures, and the Center for Primary Care Research at AHRQ, where she helped develop the U.S. Public Health Service Primary Care Policy Fellowship. Prior to joining AHRQ in 1990, Clancy was an assistant professor in the Department of Internal Medicine at the Medical College of Virginia in Richmond.

Clancy received her bachelor of science degree from Boston College and a doctorate of medicine degree from the University of Massachusetts School of Medicine. After completing medical school, she did postdoctoral training at the Kennedy Institute of Bioethics Intensive Course at Georgetown University in 1989 and the Stanford Faculty Development Program in Clinical Teaching in 1988 and was a Henry J. Kaiser Family Foundation Fellow in General Internal Medicine at the Hospital of the University of Pennsylvania from 1982 to 1984.

Clancy holds an academic appointment as a clinical associate professor at the George Washington University School of Medicine in the Department of Medicine. She has edited or contributed to seven books and has published extensively in peer-reviewed medical journals. Clancy has served on various editorial boards, including those of the *Annals of Family Medicine*, *American*

Journal of Medical Quality, and *Medical Care Research and Review*, and is a senior associate editor of the journal *Health Services Research*. Clancy has also held leadership positions in many professional organizations, including the Society of General Internal Medicine. In addition, she is an elected member of the National Academy of Social Insurance and the national Institute of Medicine (IOM) and was elected a Master of the American College of Physicians in 2004. Her research interests have been strongly influenced by the field of medical decision making and currently include the various dimensions of healthcare quality and patient care, including women's health, primary care, access to healthcare, and the impact of financial incentives on physicians' decisions.

Jared Lane K. Maeda

See also Agency for Healthcare Research and Quality (AHRQ); Clinical Practice Guidelines; Eisenberg, John M.; Equity, Efficiency, and Effectiveness in Healthcare; Health Services Research, Origins; Public Policy; Quality of Healthcare

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- AARP Speaker Biography: http://www.aarp.org/aarp_benefits/natl_events/boston/speakers/carolyn_clancy.html

CLINICAL DECISION SUPPORT

Computer systems to augment medical decision making were introduced to the healthcare marketplace in the late 1970s and early 1980s. Healthcare organizations have been using decision support in areas of marketing, cost accounting, strategic planning, and case-mix analysis. However, despite decision support being generally considered an old technology, relatively few organizations actively use it in the delivery of clinical work though many are beginning to use this capability in various ancillary department operations.

Decision support systems involve the capacity of combining data elements into information and then transforming information into knowledge on which to base logical decisions. Decision support goes beyond "who" and "what" questions to present data in a logical way to answer "what if" and "why" questions.

Benefits

A variety of research studies on clinical decision support systems have been conducted and published in the literature. There is a general consensus that clinical decision support technologies have the potential to enhance patient care and at the very least have the potential to modify clinicians' behavior. Clinical reminders and alerts, adherence to treatment plans, and suggested patient education have been reported as effective ways of changing

clinician practices. While some may say that these are features that demonstrate the value of clinical decision support, others say that while clinicians' behavior may be shown to be modified, there is little evidence of whether the actual thinking behind the practice modifications is indeed changed. Furthermore, only limited data suggest any improvement in actual patient outcomes. This represents an opportunity for further research and study.

The increasing pressures to monitor and reduce healthcare costs and demonstrate improved outcomes are driving the national trend toward using information as a strategy. Timely data are required to reduce operational inefficiencies and enhance the delivery of patient care. Disparate systems by themselves are inadequate, and data sharing through interfaces presents often inconsistent and conflicting results. Thus, mechanisms are needed to consolidate patient data in a meaningful way to present only the requisite data to make clinical decisions.

Uses

Clinical decision support systems have previously been used for a variety of retrospective analyses. These concepts have expanded into the clinical arena so that data are then presented to clinicians at the point of care and, more important, at the precise time clinical decision making occurs. In its foundation form, the clinical decision support systems include at least one trusted knowledge source (a database of known information about a particular subject, such as drug data) and a set of software programs that establish intelligence (usually referred to as a "rules engine") to process how the data from the knowledge source may apply to a specific clinical situation. Preestablished rules and guidelines, with corresponding alerts, are developed and edited as necessary by the healthcare organizations. These rules and guidelines typically integrate a variety of clinical data from multiple sources to generate clinician alerts and other treatment suggestions.

Most of these systems have been designed to perform a specific function, such as using data from the knowledge source to validate a medication order for potential drug or therapeutic interactions or against some predetermined range of laboratory result values. Specific rules are established to fit

clinical situations, such as if the patient has "X" diagnosis, the "Y and Z" classes of drugs are contraindicated, or if "A" medication is ordered, then the patient must have laboratory values within the range of "B to C." If the preestablished rule is violated, then an alert is sent back to the prescriber before the order is processed, thus giving the prescriber the opportunity to change the order or asking for an explanation as to why the action is to be taken. Rules and subsequent alerts are usually developed and managed by the healthcare organizations.

Problems and Concerns

A number of problems and concerns contribute to the relatively limited use of clinical decision support. These problems must be overcome before clinical decision support can become a trusted and valuable tool in the delivery of patient care.

First, rules are too restrictive and the subsequent alerts are wedged into the patient care thought process. Healthcare organizations that establish too many rules restrict the thought flow of its clinicians. Clinicians complain that the time required to respond to the rules inhibits productivity; as a result, many just bypass them without paying attention to the alert. Rules that are often bypassed and retained in the system become cumbersome and time-consuming. This diminishes the overall value of the clinical decision support systems and actually may contribute to additional patient care errors and reduced quality. It is critical that the organizations establish and endorse rules that are truly meaningful to the delivery of patient care and not overburden clinicians.

Second, alerts must have meaning to the clinician. Healthcare organizations using clinical decision support systems must realize that clinicians need to be informed in a variety of specific ways if they are to derive value from these systems. Some attending physicians desire e-mail inbox or pager notification, while others may desire a direct telephone call. This requires maintenance to keep alert notification as up-to-date as possible.

Third, extensive staff time is required to research, establish, and monitor rules and alerts. A working committee must be established with executive endorsement, and staff must be assigned to maintain the clinical decision support system. In

organizations that actively use these systems, the committees meet regularly to discuss new rules while monitoring established rules for usage and exception reporting. Some committee members may be assigned research tasks and then are expected to report their findings at subsequent meetings. Other clinician members who may be assigned the responsibility of discussing often bypass rules with peers with the intent of modifying behavior or changing the rules. In some cases, a valid reason exists for bypassing rules, which may then become a new rule in itself. Regardless, this is a dynamic process that requires the organization's continual commitment if clinical decision support systems are to become a valuable clinical tool and remain a viable tool over the long term.

Last, knowledge sources may not be up-to-date. Healthcare knowledge continuously evolves and changes. Out-of-date knowledge sources may actually contribute to reduced quality and more errors. Healthcare organizations must implement processes that ensure that knowledge sources are updated as necessary to reflect current data available in the industry.

Establishing a true clinical decision support system environment has become a high priority in some healthcare organizations, but many must still implement electronic medical records and bedside medication administration applications before rules and alerts have full utility. While many healthcare organizations recognize the value of decision support, a thorough understanding of the need for foundation applications in addition to the critical success factors and the organizational commitment required to make clinical decision support a useful utility are the first steps to success.

Lawrence M. Pawola

See also Computers; E-Health; Electronic Clinical Records; E-Prescribing; Forces Changing Healthcare; Healthcare Informatics Research; Health Informatics; Health Insurance Portability and Accountability Act of 1996 (HIPAA)

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Healthcare Information and Management Systems Society (HIMSS): <http://www.himss.org>

CLINICAL PRACTICE GUIDELINES

Clinical practice guidelines are increasingly being used in the United States to reduce inappropriate care and improve patient outcomes. Several factors are fueling the use of guidelines, including the increasing costs of healthcare, new medical technology, a growing aging population, and variations in the service delivery of care by physicians, hospitals, and geographic regions. Clinical practice guidelines are broadly defined as statements that are systematically developed to assist clinicians and patients in making decisions about appropriate healthcare, given specific clinical conditions. Specifically, the major purposes for guidelines include the following: (a) assisting patients and practitioners in making clinical decisions, (b) educating individuals and groups, (c) assessing to ensure the quality of healthcare, (d) providing guidance for allocation of resources, and (e) reducing liability risk in cases of negligent care.

Primarily, clinical practice guidelines are of most value to healthcare practitioners, patients and their families, and healthcare institutions. In an effort to contain healthcare costs, public policymakers, health benefit plans, and regulators may find them useful when making specific decisions

about reimbursement. For patients, a consumer version of guidelines made available through leaflets, audiotapes, videos, magazines, newspapers, and Web sites provides a summary of the benefits and harm regarding healthcare options and potential outcomes. Guidelines empower patients to become more educated consumers, active in choices about their own health. Guidelines may also help the patient by calling attention to the need for changes in public policy regarding issues such as preventive interventions to assist neglected or high-risk groups or other areas requiring increased attention. For healthcare providers, guidelines can improve the quality of clinical decisions by providing clear directions on how to proceed with an intervention, keeping clinicians updated, improving consistency of care, and providing an authoritative base for decision making. Healthcare organizations may primarily benefit from guidelines by minimizing costs and optimizing the value of money spent through the greater standardization of care.

Despite all the perceived benefits, clinical practice guidelines have their limits. Recommendations may not apply readily to an individual patient, requiring clinicians to tailor decisions based on the patient's unique medical history and personal circumstances. Guidelines may also influence policymakers to refuse to pay for certain services. In terms of their development, guidelines may be flawed due to a lack of adequate scientific evidence, inadequate evaluation of study design flaws, the bias of the group that developed the guidelines, or a bias in favor of serving the needs of payers or special interests groups rather than with the patient's best interest. In weighing their advantages and disadvantages, guidelines may be best viewed as one option for improving the quality of healthcare.

The development of clinical practice guidelines involves three basic stages: (1) development, (2) implementation, and (3) evaluation. This process or cycle is dynamic in that the implementation and evaluation stages prompt periodic revisions when they become outdated due to new scientific evidence, when omissions are found, or when other problems are identified. Historically, most of the focus has been on the development phase. In more recent years, however, the last two stages have received growing attention.

History

While clinical practice guidelines, broadly defined, were in use for numerous aspects of healthcare for some time, a more formalized approach to guideline development began in the United States when an amendment to the Public Health Service Act in 1989 replaced the National Center for Health Services Research (NCHSR) with the Agency for Health Care Policy and Research (AHCPR). The Omnibus Budget Reconciliation Act of 1989 (PL 101-239) mandated the AHCPR to have a stronger emphasis on medical outcomes and effectiveness research and to develop, disseminate, and evaluate clinical practice guidelines. A newly created office, the Forum for Quality and Effectiveness in Health Care, was charged with this task. The AHCPR sought advice from the national Institute of Medicine (IOM) on how best to approach its newly appointed responsibilities involving clinical practice guidelines. The IOM is an advisory body of experts who provide science-based advice on critical national issues in biomedical science, medicine, and public health to the federal government and the public. The IOM appointed a study committee for technical assistance and advice on defining terms and determining key components of guidelines, implementation, and evaluation. This committee produced two reports, *Clinical Practice Guidelines: Directions for a New Program* (1990) and *Guidelines for Clinical Practice: From Development to Use* (1992).

The legislation that spawned the work of the AHCPR stemmed from a growing national concern with the high cost of healthcare, inconsistency in medical-practice patterns, and the perceived low value of some health services. The main goal of the AHCPR was to expand knowledge rather than focus on applications. The ultimate goal was to rely less on purely professional judgment and move more strongly toward a more structured approach to support healthcare decisions.

The Forum for Quality Effectiveness in Health Care was charged with arranging the development and periodic review of clinical practice guidelines. The guidelines were not to be created by the federal government but could be contracted with public and nonprofit private organization or produced by expert panels to develop and update them. The goal was to have guidelines, standards,

performance measures, and review criteria for at least three clinical treatments or conditions by 1991. Guidelines development has continued with an array of developers.

Developing Guidelines

Clinical practice guidelines are developed by many organizations, including professional societies, public agencies, healthcare institutions, and researchers. Insurers, health maintenance organizations (HMOs), and other private organizations have also been active in their development. Guidelines may be developed through single or collaborative effort.

In the medical professions, various academies, colleges, and societies have included the development of guidelines in addition to their sponsorship of peer-reviewed clinical journals for given specialties. Public agencies play a role in guideline development mainly to promote public health and welfare, to improve quality, and to control the costs associated with government-funded healthcare programs. Federal agencies such as the Agency for Healthcare Research and Quality (AHRQ) (formerly the AHCPR) and National Institutes of Health (NIH) also play key roles, with related activities occurring in the Food and Drug Administration (FDA), the Centers for Disease Control and Prevention (CDC), and the Centers for Medicare and Medicaid Services (CMS).

The large number of organizations developing clinical practice guidelines lends great breadth to the topics available and to the diversity in the manner in which they are developed. These variations, however, lead to variable quality. According to the IOM, the guidelines can vary in five key ways: (1) clinical orientation (clinical condition, technology, or process); (2) clinical purpose (screening and prevention, diagnosis, aspect of treatment, more discrete aspects of healthcare); (3) complexity (high, medium, or low as indicated by the amount of detail, complexity of logic, length of narrative or documentation); (4) format (free text, tables, if-then statements, critical pathways, decision paths, algorithms); and (5) intended users (practitioners, patients, others).

The U.S. Congress mandated that the AHCPR present clinical practice guidelines in formats

appropriate for use by practitioners, medical educators, and medical care reviewers. After the sponsoring agency or organization has created and disseminated an initial set of guidelines, the guidelines may be transformed into various other forms of presentation for various publications or groups who may benefit from them (e.g., journals, continuing medical education, specific user groups).

To encourage the developers of guidelines to use criteria to improve their processes and products, the IOM outlined eight desirable attributes of guidelines: (1) validity (including strength of evidence and estimated outcomes), (2) reliability/reproducibility, (3) clinical applicability, (4) clinical flexibility, (5) clarity, (6) multidisciplinary process, (7) scheduled review, and (8) documentation.

A concern was that guidelines published in peer-reviewed medical journals do not follow standards for guideline development, often lacking critical information to determine their validity. To address the problem, in 2002, the AHRQ supported the Conference on Guideline Standardization (COGS), which developed a checklist of components for the evaluation of the validity and usability of guidelines.

Clinical practice guidelines are generally developed through a series of steps. The first step involves initial decisions such as the selection of the topic (e.g., condition, procedure), selection of panel members (e.g., physicians, nurses, dentists, epidemiologists, statisticians), and clarification of purpose (e.g., specification of the target condition, type of patient, clinical presentations for use of the guidelines, and interventions). Next, there is an assessment of the clinical appropriateness based on clinical benefits and harms, admissible scientific evidence, and expert consensus. A summary of benefits and harms based on scientific evidence and expert consensus is generated. This summary helps determine which practices are appropriate, are inappropriate, or are of uncertain appropriateness in the clinical situation. An assessment is then made of public policy issues that affect the broader society. Considerations involve limitations in resources such as payment, opportunity, equipment, and personnel. Feasibility issues are also considered to determine if the research findings are applicable to real-world situations. Guidelines are then drafted to provide clear recommendations

and the rationale on which they are based. Content experts review the guidelines to ensure scientific and content validity. A sample of practitioners may be asked to pretest the guidelines and provide suggestions for improvements of the document. Recommendations are then made through a plan for dissemination, evaluation, and updating. Finally, guidelines outline recommended research priorities to call attention to important gaps in scientific evidence. Disclaimers and references complete the document.

Since the 1990s, with the growth of the evidence-based medicine (EBM) movement, the development of clinical practice guidelines has increasingly been based on scientific research evidence where available, but it also relies on expert consensus, especially when such evidence is lacking. Experts are selected based on expertise in the appropriate area, and credibility with the target audience by random or purposeful sampling. Members of the selected group are asked to take cues into account when making their decisions. Cues are dimensions or indicators to consider, such as a description of a situation as part of a scenario or vignette, or the severity of a condition.

When using expert consensus, clinical practice guidelines are generally developed by using one of three methods: (1) the nominal group technique (NGT), (2) the Delphi method, or (3) a hybrid of the two. The NGT aims to structure an interaction within a group. Each participant independently records his or her ideas. The facilitator then lists one idea from each participant in turn until all ideas have been recorded for the group. Each idea is discussed in turn. Participants then return to privately record their opinions and vote. The group may reconvene to discuss and vote. Group judgment is aggregated statistically from individual opinions. In contrast, the Delphi method involves no direct interactions by the participants. Initial views are collected via a mailed questionnaire. Participants are asked to suggest the cues to be used in decision making. At the next stage, another questionnaire is sent that asks for the individual's views, often using a Likert scale. The organizers then compile the results and send a summary indicating individual and group judgments. Over one or more opportunities, individuals may modify their judgment based on information provided by

the group. A third option, the modified Delphi method, asks the participants to first express their opinions by a mailed questionnaire that is sent to the group. The group then meets to discuss their opinions and records their final judgments by a questionnaire. Finally, a consensus development conference brings together a selected group of about 10 people to meet over the course of a few days. Interest groups or experts unrelated to the decision-making group present evidence. Participants disperse to determine their opinions and then reconvene to reach consensus through a chaired discussion.

Recently, systematic reviews of research have provided the foundation for guideline development. The judgment of experts has been criticized as lacking sufficient objectivity and rigor. Basing guidelines on scientific evidence rather than expert opinion has been found to be more thorough but also more costly.

Implementing Guidelines

The implementation of clinical practice guidelines involves a cultural shift in the healthcare system from one that traditionally relied on professional judgment and discretion to one that requires accountability for judgments. Formal organizational structures and management must support the use of clinical guidelines. For the guidelines to be relevant, it is important for physicians and others to develop those that are tested in actual clinical settings rather than solely in controlled clinical trials. As practitioners adopt the guidelines, more information becomes available in adapting and revising them to make them more useful for clinical outcomes.

The implementation of clinical practice guidelines is often considered more challenging than their development. Yet their true value lies in their successful use. Many of the potential users may not be aware of the existence of guidelines that could be helpful in their decision making, or they may see them as only marginally related to their practical daily work. Guidelines may be seen as a threat to professional autonomy, resulting in rejection of their use. While guidelines may be useful to patients, their implementation involves direct education to make the patients aware of guidelines that could be useful to them.

Evaluating Guidelines

Clinical practice guidelines make explicit recommendations to influence clinical decision making. They present evidence, costs, and a model for making decisions but also contain a value judgment based on the groups that produced them. Before a guideline is adopted for use, it should be evaluated for validity. For example, it is important to determine what methods were used and if the evidence was collected systematically. All reasonable practice options and potential outcomes should be considered with an estimation of how likely the outcome will occur. It is important to note if the guideline is current with recent developments by looking at the data on the guideline and the date that final recommendations were made. To account for individual value differences, it is necessary to determine if the guideline was subject to peer review and testing. The recommendations should provide practical and unambiguous advice. The strength of the recommendations should be indicated based on the literature and taxonomies that measure “levels of evidence” as deemed appropriate for the given specialty. Of utmost importance is evaluating whether the recommendations are applicable to the patient in question based on medical history, individual circumstances, or other factors.

Updating and Withdrawing Guidelines

Clinical practice guidelines need to be evaluated periodically, in terms of both content and validity, to avoid potential breakdowns in the process of care or poor patient outcomes. Guidelines may become obsolete as new scientific information becomes available. The volume of research advances, and the amount of time between reviews will determine how thorough the update needs to be. Conducting a traditional systematic literature review can be both time-consuming and costly. Most commonly, it is recommended that guidelines receive a scheduled review date. Guidelines may require an update when new information becomes available. However, the optimal timing for such an update is unclear.

Updating guidelines should occur when changes in clinical evidence make a preexisting guideline invalid, when new outcomes become important

(such as quality of life), when new interventions supersede or complement other interventions, when the gap between ideal and current practice narrows to the point that a guideline is no longer needed, when society changes values based on specific outcomes, or when increases in service delivery warrant an update. A suggestion that has received increasing favor is a model using the expert opinion of a multidisciplinary group and focused literature reviews based on target review articles, editorials, commentaries, new guidelines found in registries, and articles that reference the guidelines to determine when a guideline requires an update. Based on this method, some guidelines may remain valid, while others may become obsolete.

Locating Guidelines

Clinical practice guidelines are available through a number of agencies, organizations, and resources, including the National Guideline Clearinghouse, the Cochrane Collaborative, and several databases.

The National Guideline Clearinghouse is an initiative of the AHRQ. Hosted on the AHRQ's Web site, the clearinghouse provides a publicly available comprehensive database consisting of more than 1,000 evidence-based clinical practice guidelines. It provides structured abstracts of the guidelines and their development and links to full-text guidelines, when available, or information for ordering print copies. A guideline comparison feature is available that allows a comparison of two or more guidelines side-by-side along with other components and features noted on the Web site.

The Cochrane Collaboration provides a compilation of five databases for finding evidence to assist in deciding on the best treatment for a given condition. These include the following: (a) Cochrane Database of Systematic Reviews; (b) Database of Abstracts of Reviews of Effects; (c) Cochrane Central Register of Controlled Trials; (d) Cochrane Methodology Register; (e) Health Technology Assessment Database; and (f) the National Health Service (NHS) Economic Evaluation Database.

Clinical practice guidelines may also be found by searching the CINAHL (Cumulative Index to Nursing and Allied Health Literature) and PubMed databases. In CINAHL (available by subscription),

the phrase *practice guidelines* may be selected from the “Publication Type” menu. In PubMed (freely available from the National Library of Medicine), under the “Limits” tab, the box for “practice guideline” can be checked in the section under “Type of article.”

Institutions and centers within the NIH often post guidelines on their Web sites. These may be searchable via the Web search feature on the page by using the search terms *guidelines*, *practice guidelines*, or *clinical practice guidelines*.

Barbara Nail-Chiwetalu

See also Agency for Healthcare Research and Quality (AHRQ); Clinical Decision Support; Evidence-Based Medicine (EBM); National Guideline Clearinghouse (NGC); National Institutes of Health (NIH); Outcomes Movement; Quality of Healthcare; United Kingdom’s National Institute for Health and Clinical Excellence (NICE)

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- Agency for Healthcare Research and Quality (AHRQ): <http://www.ahrq.gov>
- Cochrane Collaboration: <http://www.cochrane.org>

- Institute for Clinical Systems Improvement (ICSI): <http://www.icsi.org>
- National Guideline Clearinghouse (NGC): <http://www.guidelines.gov>
- National Heart, Lung, and Blood Institute (NHLBI): <http://www.nhlbi.nih.gov/guidelines>

COCHRANE, ARCHIBALD L.

Archibald L. (Archie) Cochrane (1909–1988) was a British physician who contributed greatly to the development of epidemiology, and he was a pioneer in evidence-based medicine. His ideas eventually led to the creation of the international Cochrane Collaboration, which tracks down, evaluates, and synthesizes the results of clinical trials and other studies in all areas of medicine.

Cochrane was born in 1909 in Scotland to a wealthy family. He began his medical studies in 1934 at the University College Hospital, London, after receiving first class honors in the Natural Sciences Tripos from King’s College, Cambridge. In 1936, he served in a field ambulance unit in the International Brigade in the Spanish Civil War. In 1938, he qualified in medicine (receiving what is equivalent to a medical degree in the United States). With the outbreak of World War II, Cochrane enlisted and served as a captain in the Royal Army Medical Corps. While on duty in Crete in 1941, he was captured and taken prisoner by the Nazis. For the rest of the war, he was as a medical officer in various prisoner-of-war camps in Greece and Germany. Many prisoners he treated suffered from tuberculosis, and he became interested in studying the disease. After the war, through a Rockefeller scholarship, he attended the Diploma in Public Health program at the London School of Hygiene and Tropical Medicine. In 1947–1948, he left Britain to study the epidemiology of tuberculosis at the Henry Phipps Institute in Philadelphia.

Returning to the United Kingdom, from 1948 to 1960, Cochrane was a member of the Medical Research Council’s (MRC’s) Pneumoconiosis Research Unit in Penarth, Wales. His work at the council included the study and classification of pneumoconiosis, a common occupational lung disease of coal miners in Wales. At his work, he

became increasingly interested in the reproducibility of all clinical and related measurements, as well as many aspects of field epidemiology, such as the standardization of collected data and the validation of diagnoses.

In 1960, Cochrane was appointed the David Davies Professor of Tuberculosis and Chest Diseases at the Welsh National School of Medicine in Cardiff. He also became the director of the Medical Research Council Epidemiology Research Unit.

In 1972, Cochrane gave the Rock Carling Lecture “Effectiveness and Efficiency: Random Reflections on Health Services,” which was subsequently published as a book. In the book, which he is best known for, Cochrane stressed the need to use the evidence from randomized controlled trials (RCTs).

In 1974, he presented the Dunham Lectures at Harvard University; and in 1975, he became an honorary fellow of the American Epidemiological Society.

Archibald Cochrane died in 1988 at the age of 79. His autobiography, *One Man’s Medicine*, written with the assistance of Max Blythe, was published in 1989.

Cochrane’s ideas were instrumental in the founding of the Cochrane Collaboration in 1993. The collaboration is an international, nonprofit, independent organization that produces and disseminates systematic reviews of healthcare interventions and promotes the search for evidence from clinical trials and other studies. Its major product is the Cochrane Database of Systematic Reviews, which is published quarterly as part of the Cochrane Library.

Rosemary Walker

See also Epidemiology; Evidence-Based Medicine (EBM); Physicians; Public Health; Quality of Healthcare; Randomized Controlled Trials (RCTs)

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Web Sites

Cochrane Collaboration: <http://www.cochrane.org>

CODMAN, ERNEST AMORY

Ernest Amory Codman, MD (1869–1940), had a guide star for his life’s work: the *end results idea*. He argued that patients and physicians should know the end results of the medical care they receive and give so that patients can choose good care and physicians can learn from their mistakes and improve their care.

In 1889, even before he graduated from Harvard College (class of 1891) and Harvard Medical School (class of 1895), he started a yearly log of his bird-hunting efficiency. He recorded the number of shots fired (process) and birds killed (outcome or end results of hunting) and the rates of birds to shotgun shells expended (efficiency).

In those days, medical students at the Massachusetts General Hospital gave anesthesia during surgery. Codman bet his classmate and best friend, Harvey Cushing (1869–1939), who later became a renowned neurosurgeon, to see who would have better outcomes of their care. The result was the first use of anesthesia charts, graphing the patients’ pulse and respiration every 5 minutes.

Briefly Codman became the first radiologist at the Boston Children’s Hospital. He ran the fluoroscopy for the landmark physiological experiments of Walter B. Cannon (1871–1945) showing a goose swallowing a radiologically opaque button.

Codman became a junior surgeon at the Massachusetts General Hospital and followed up on the outcomes of all patients he cared for. He urged others to do the same. Unsatisfied with the

willingness of this hospital to adopt his ideas, he created his own proprietary “End Result Hospital” nearby, where he could pursue his ideas about hospital efficiency. His hospital existed from 1911 until 1918. All patients treated at the hospital were followed up after discharge, with the results reported, patient by patient, and published at Codman’s own expense for all to read.

Here is an example of what was written (Case #17): “February 10, 1912, Female, 39, Hemorrhoids Operation (EAC) clamp and cautery. Complications: none, Result Sept. 8, 1913. Well, except for annoyance from skin tabs which were not removed (E-j).” Note that for the case, the surgeon is named (Codman), the process of care is described, a post-discharge follow-up of the patient’s perception and physical condition is included, and the public recording of the surgeon’s error in judgment (E-j) is given.

His error classification is another of his many contributions. In this case, Codman decided that he had made an error in not removing the skin tabs. This brief description is as plausible to us today as when Codman wrote it.

In 1910, Codman helped start the American College of Surgeons. He chaired its Committee for Hospital Standardization, which studied hospital outcomes (end results) and how they could be improved. Eventually the committee led to the creation of the Joint Commission.

On January 8, 1915, Codman unveiled a large cartoon at a local surgical society meeting showing his colleagues as being more interested in money than end results. This was the peak of his undiplomatic outspokenness in advocacy of his end results beliefs. His colleagues were offended, his medical income fell, and his hospital was closed in 1918, when he entered military service. Codman would eventually create end result cards for all the soldiers he treated in World War I.

After the war, Codman returned to surgical practice in Boston. He started a registry of bone sarcoma, which is the forerunner of all cancer registries. In 1934, he wrote the first book ever written solely on the shoulder, which is considered a classic work in orthopedic surgery. The book’s preface contains his autobiography, while the last chapter of the book discusses the influence of economics on surgery.

Codman received no appreciation during his lifetime. He was ostracized by many of his peers,

he received no patient referrals, and he had few patients and little income. When he died, he was too poor to afford a headstone and was buried in an unmarked grave. However, Codman realized he was ahead of his time and thought that future generations would appreciate his end result ideas.

In 1996, the Joint Commission established an award in his honor. The Codman Award is awarded annually to recognize the achievements of individuals and organizations in the use of process-and-outcome measures to improve the quality and safety of healthcare.

Duncan Neuhauser

See also Health Report Cards; Joint Commission; Medical Errors; Outcomes Movement; Patient Safety; Quality Indicators; Quality of Healthcare

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Joint Commission: <http://www.jointcommission.org>

COHEN, WILBUR J.

Wilbur J. Cohen (1913–1987) was the Secretary of the Department of Health, Education, and Welfare (DHEW) under President Lyndon Johnson, but today Cohen is often credited with a larger role in public service. He is seen as the key architect of the American social welfare system. A participant in drafting the Social Security Act of 1935, Cohen was also closely associated with the passage into law of Medicare legislation in 1965. Between those two watershed events in American welfare history, Cohen proved himself a tireless advocate of federal assistance for America's most vulnerable members.

The conditions of Cohen's early life likely contributed to his later advocacy for social welfare. The son of immigrants, Cohen grew up in Milwaukee in modest circumstances. His father was a grocer. And from an early age, Cohen was keenly aware of economic disparities. Cohen was also intelligent and a good student in school. At the University of Wisconsin–Madison, he majored in economics, influenced in his choice by the great depression that had settled on the nation in the early 1930s. There he distinguished himself as an energetic and hardworking student and, more important, made contacts that were to prove immensely helpful in launching him into a career in government.

After graduating in 1934, Cohen considered graduate school and a career in academe but instead accepted a job as a research assistant with a former professor in Washington, D.C. Edwin Witte was one of a number of academics who were drawn to Washington to assist in writing the New Deal legislation of President Franklin D. Roosevelt. Witte was then executive director of the Committee on Economic Security, working under Arthur Altmeyer (another Wisconsin alumnus), the Assistant Secretary of Labor.

Cohen arrived in Washington in 1934 and found it much to his liking, a heady place for a bright young college graduate with liberal leanings and boundless energy. Working under Witte on the Committee on Economic Security, Cohen helped write language that eventually became the basis of the nation's first social insurance legislation. In 1935, President Roosevelt signed into law the Social

Security Act, the most well-known provision of which was insurance for the elderly. Cohen, at the age of 22 years, had played a part in drafting it.

A provision of the act created the Social Security Board—later known as the Social Security Administration—and Altmeyer, a board member, offered Cohen a job. For the next 20 years, Cohen served as a staff member of the board, and in that time he worked to expand the provisions of the original Social Security Act well beyond its original coverage. In 1939, for example, he was much gratified when amendments to the act added survivor benefits to the original legislation.

As director of the Bureau of Research and Statistics within the Social Security Administration, Cohen developed a keen knowledge of the technical aspects of the Social Security programs, which he used to good effect as a congressional liaison, providing crucial assistance in drafting public policy language, statements, and scripts. Cohen was a technocrat—a technical expert—but he was by no means a minor bureaucrat only handy with statistics. Instead, he played an important part in drafting national welfare policy and persuading legislators to embrace it and make it their own cause.

In the 1940s and 1950s, Cohen played a part in advancing the idea of national health insurance, which to him seemed a logical extension of the original Social Security legislation, leading to healthcare for all Americans. While Cohen was unsuccessful in that effort, he was nonetheless able to help expand incrementally the benefits of Social Security, which by the 1950s had become a popular program receiving bipartisan support. In 1956, the U.S. Congress passed legislation that added disability benefits to the Social Security program. In the same year, Cohen made a significant career change, leaving Washington for Ann Arbor, where he became a professor of public welfare administration in the School of Social Work at the University of Michigan.

After the 1960 national elections, Cohen was invited to join President John F. Kennedy's team as Assistant Secretary for Legislation in the Department of Health, Education, and Welfare. In New Frontier Washington, Cohen set to work on national health insurance for the elderly. This was to be part of Kennedy's vision of a "second generation" of social welfare programs, and Cohen, as an expert on Social Security, was a logical choice to play a

central role in it. After President Kennedy's death, Cohen remained in Washington, a member of President Johnson's Great Society team, where he was able to continue much of the work begun under Kennedy.

Cohen threw himself into the push for Medicare. He assisted in writing legislation; he worked with legislators to get the bill through Congress; and later, he helped implement its provisions. In that effort, he was fortunate in having the support of Arkansas Congressman Wilbur D. Mills, the powerful Democratic chairman of the House Ways and Means Committee, and in securing other political alliances to ensure its passage. The year 1965 was a watershed for social welfare legislation, as Medicare became law and Medicaid expanded healthcare to the poor. It was also the high watermark of Social Security expansion, just as it was, on a personal level, among the high points of Cohen's career in Washington, second in importance to his confirmation as Secretary of the Department of Health, Education, and Welfare (DHEW) in 1968. At the swearing-in ceremony for the new DHEW Secretary, President Johnson acknowledged Cohen's "role in every piece of social legislation in the last 35 years."

When President Johnson left public office in 1969, Cohen returned to teaching at the University of Michigan. But he could not put his political agenda behind him. Settled into academe, Cohen was never far from the ongoing social welfare battles in Washington, which he viewed from a distance with a passionate interest and outspoken advocacy. Cohen retired from the University of Michigan in 1978, but he returned to the classroom 2 years later, accepting a professorship in the Lyndon B. Johnson School of Public Affairs, University of Texas at Austin. Until his death in 1987, Cohen continued to speak out in support of social welfare legislation and in defense of the Social Security programs he had done so much to build.

From Roosevelt's New Deal to Johnson's Great Society, Wilbur Cohen played a part in shaping national welfare policy. A technocrat with a keen understanding of the statistical arguments for Social Security expansion, Cohen was also a skillful salesman of the programs he promoted. He was a man with the political contacts and know-how for guiding legislation through the U.S. Congress. It is a telling comment on Cohen's lifelong passions

to note that he maintained a home near Washington after leaving federal employment in 1969. Until the end of his life, Cohen traveled to Washington from Ann Arbor and later Austin, staying at his home near the city that had been the scene of so many of his personal triumphs.

James Hill and Samuel Levey

See also Access to Healthcare; Health Insurance; Health Services Research, Origins; Medicaid; Medicare; National Health Insurance; Public Health; Public Policy

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COHORT STUDIES

Cohort studies represent a type of epidemiological approach to investigating the incidence and prevalence of disease across a fixed population group over time. Using this type of approach, researchers compare outcomes between a cohort, or group, of individuals who have a risk factor (e.g., smoking) believed to be associated with a disease (e.g., lung cancer) and a group without the factor (e.g., non-smokers). Cohort studies can be conducted either prospectively or retrospectively.

Prospective Cohort Studies

Prospective cohort studies involve following a large group of individuals who are initially free of the

disease of interest over time (often years and sometimes decades). Typically, cohort studies do not employ a randomized design because of potential ethical problems. That is, it is neither ethical nor easy to randomly assign people to be exposed to a potential risk factor for the disease of interest. Instead, the individuals in the group and their various exposures to risk factors are determined, and the development of the specific disease is determined.

The advantages of prospective cohort studies are as follows: They are able to develop and test hypotheses about the cause-and-effect relationships between identified risk factors and disease outcomes because the temporal ordering of events can be determined; they can measure multiple outcomes of a single risk factor to study relatively rare exposures to risk; and they measure the absolute or true risk of the factor under study.

The disadvantages of prospective cohort studies are as follows: They take a long time to complete; they are very expensive to conduct; they require considerable monitoring and management effort; and they may have high rates of participant attrition or many individuals lost to follow-up. Prospective cohort studies are also not well suited to study rare diseases because of the limited number of potential cases and the often long time between exposure to a risk factor and the development of a disease.

The Framingham Heart Study

Because of their high costs, long-term, prospective cohort studies are relatively rare. Perhaps the best-known and most famous prospective cohort study is the Framingham Heart Study. This study, which began more than 60 years ago, is still ongoing. The Framingham Heart Study is heralded as being responsible for the discovery of the major risk factors associated with cardiovascular disease.

Originally funded by the National Heart Institute (now the National Heart, Lung, and Blood Institute) in 1948, the study recruited a cohort of more than 5,000 adults aged 30 to 62 living in the small town of Framingham, Massachusetts. These individuals, who did not have cardiovascular disease when they started the study, were studied and received medical tests every 2 years to determine the underlying factors associated with the later development of heart disease. The study's first report, which focused on

the progression of rheumatic heart disease, was released in 1956. The original cohort was studied until 1971, when a second-generation cohort was recruited. In 2002, the third cohort, grandchildren of the original cohort, consisting of 3,900 individuals, became the latest cohort to join the study.

Over the years, the Framingham Study has uncovered and popularized the major underlying risk factors of heart disease, including high cholesterol, high blood pressure, diabetes, obesity, and cigarette smoking. The study has also identified the interactions between and among these risk factors. Additionally, it has focused on the effects of social and psychological factors, such as stress and the genetic links to heart disease. The study continues to further identifying and determining a myriad biological, social, psychological, lifestyle, and genetic effects of cardiovascular disease.

The most recent results from the Framingham Heart Study, investigating the genetic links associated with cardiovascular disease, indicate that individuals with a sibling having a stroke or arterial disease have a 45% increased risk of developing the same disease.

Retrospective Cohort Studies

Retrospective cohort studies are sometimes conducted using old records of individual groups. These studies attempt to determine a group's past exposure to a risk factor and an outcome. For example, to investigate the risk of exposure to a particular chemical and the development of a disease, researchers may use the employment records of past workers at a factory to identify their exposure and medical and death records to determine the outcome.

It should be noted that the term *retrospective studies* often refers to retrospective case-control studies, which do not follow individuals over time but rather look in the past for measures of association. These types of studies are generally viewed as a subset of cohort studies. Typically, a retrospective case-control study involves using existing medical records as the primary data source. Individuals are selected for inclusion into the study based on the outcome or disease of interest (the cases). And a comparable group without the outcome is selected as a control group.

One major advantage of the retrospective case-control studies is their ability to study the effects of risk factor exposure to the development of rare diseases. This is because the case group can be identified from a broader population and because the researcher knows the subjects have the disease compared with waiting for the disease to occur after the risk exposure. Retrospective studies have become more popular as the quality and efficacy of diagnostic procedures and the quality of medical record information have improved. There are a number of additional advantages to the case-control approach. They are relatively inexpensive to conduct because they do not require as much management; they allow the study of diseases where there is a long time period between the exposure to a risk factor and the development of the disease; and they are far less time-consuming than prospective studies.

Retrospective studies, however, also have several disadvantages. First, although several risk factors can be analyzed at one time, the study can only focus on one disease. Second, since many clinical records are not specifically designed for research purposes, their completeness may be questionable. Third, exposure to extraneous factors cannot be completely controlled for using a case-control approach.

Ralph Bell

See also Acute and Chronic Diseases; Disease; Epidemiology; Morbidity; Mortality; Public Health; Randomized Controlled Trials (RCTs); Risk

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- National Center for Health Statistics (NCHS):
<http://www.cdc.gov/nchs>

COINSURANCE, COPAYS, AND DEDUCTIBLES

Coinsurance, copays, and deductibles are utilization management tools used by health insurers to limit the extent of moral hazard. Moral hazard is the tendency of individuals to use more healthcare services because they are insured. Coinsurance is defined as the percentage of the agreed-on provider charge that the insured is obligated to pay out of pocket. A copay is a fixed dollar amount per service that the insured is obligated to pay regardless of the amount the insurer has negotiated with the health services provider. A deductible is an amount of expenditure for covered health services that an insured individual must pay before the health plan has any obligation to pay for services.

Overview

Traditionally, an insured individual was expected to pay 20% of a bill for healthcare services he or she used. Higher percentages of coinsurance are now sometimes used for out-of-plan use by the insured in preferred provider organizations (PPOs).

A copay is paid for by the insured individual at the time of the provider visit. A typical copay may be \$20 per physician office visit or \$70 for an emergency department visit.

Historically, \$250 or \$500 deductibles were common. Today, high deductible health plans often require that an insured individual incur expenditures of \$5,000 before the plan begins to pay. Deductibles are also sometimes used for specific services rather than aggregate expenditures. For example, a health plan may require that the insured individual satisfy a \$500 deductible for

hospital services if he or she chooses to use some hospitals in the community but will not require the deductible for other, preferred hospitals.

Moral hazard in healthcare occurs because people who are insured do not bear the full cost of their care. If patients are very price sensitive, meaning they are responsive to price, a small decrease in the out-of-pocket price will result in large increases in the use of the service. Analogously, if a small coinsurance rate or copay is imposed, patients substantially reduce their use of some health services. A deductible also obligates the patient to pay a portion of the bill and would reduce health services utilization.

Empirical Evidence

The key issue surrounding the use of these utilization management tools is the extent to which they actually do reduce utilization and affect health. The RAND Health Insurance Experiment continues to be the general definitive study of the effects coinsurance and deductibles have on the use of services.

The basic finding from the RAND Health Insurance Experiment is that health services, generally, have a price elasticity of about -0.2 . This means that a 10% increase in the out-of-pocket price reduces the use of services by about 2%. However, the effects of changes in price differ rather substantially across particular types of health services. Ambulatory mental health visits, for example, are much more price sensitive than are physician visits. Dental care exhibits a large transitory effect not seen with other services, and hospital care is much less price-responsive than physician services.

This has important implications for the structure of health insurance plans and the use of other utilization management techniques. It suggests, for example, that coinsurance and copays are much more likely to be used for ambulatory services, such as physician visits, prescription drugs, and mental health services, than for inpatient care. Because of this, one would expect to see other utilization management techniques used on the inpatient side. Thus, managed-care plans tend to rely on preadmission certification and concurrent review to reduce moral hazard in the inpatient hospital

setting but use differential copays and/or coinsurance for services that are more price sensitive.

The success of copays and coinsurance in limiting utilization will depend in part on the opportunity cost of the patient-consumer's time. The "full price" of a visit to a physician includes not only the amount of money the patient must pay but also the value of the time associated with getting to the physician's office, waiting to be seen, being seen, and returning to other activities. If these activities take 2 hours and the patient is an attorney who could be billing clients at \$400 an hour, the full price of the visit is \$800 plus the actual money price paid to the physician. For someone earning \$10 an hour, the full price is \$20 plus the physician's fee. If the same copay or coinsurance rates were applied to the physician's fee, it would obviously have a smaller impact on the attorney's use of services. The implication is that smaller copays or coinsurance rates may be effective in reducing the utilization of lower-income groups, whereas substantially higher amounts would be required to have the same effect on upper-income consumer-patients.

Differential or tiered copays have become common, particularly for prescription drugs, where there are different copays for generic, preferred brand, and nonpreferred brand drugs. One study by Geoffrey Joyce and associates in 2002 compared insured individuals with one regime of copays relative to another. In every tier, for each drug type, those with higher copays had lower drug expenditures. The price elasticities ranged from -0.22 to -0.40 , with the three-tier nonpreferred brand name prescriptions being the most price sensitive. The study also demonstrated expenditure reductions in moving from a one- to a two-tier drug plan or from a two- to a three-tier drug plan. The price sensitivity in the nonpreferred brand tier was greatest because it is in this tier that the patient-consumers have the greatest availability of lower-priced substitutes.

Deductibles have become a potentially more important insurance utilization management tool with the advent of consumer-driven health plans (CDHPs) and health savings accounts (HSAs). The RAND Health Insurance Experiment found that a \$4,160 family deductible (in 2006 dollars) followed by free care reduced medical care expenditures by 31%. More recent work from the

Netherlands found reductions of 28% for a similar insurance program with a \$1,280 or more deductible (in 2006 U.S. dollars). This study suggested that a family deductible of \$1,000 U.S. dollars might reduce spending by approximately 14%.

Michael A. Morrisey

See also Consumer-Directed Health Plans (CDHPs); Health Economics; Health Insurance; Health Insurance Coverage; Health Savings Accounts (HSAs); Medicare; Moral Hazard; RAND Health Insurance Experiment

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- RAND Health Insurance Experiment:
<http://www.rand.org/health/projects/hie>

COMMITTEE ON THE COSTS OF MEDICAL CARE (CCMC)

The Committee on the Costs of Medical Care (CCMC) was the most influential health services research group in the United States during the late 1920s and early 1930s. The CCMC, which was

composed of 48 members, including physicians, dentists, public health professionals, and economists, was established to study the escalating costs of medical care, access to care problems, and distribution of health services in the nation. Starting in 1927, the committee published 27 research reports on its findings. The committee's final report, published in 1932, made recommendations for more economical and effective healthcare. It discussed health insurance mechanisms, increased national and state funding, and the role of preventive health. However, the committee could not reach a consensus, and its final report included a majority report and two minority reports. Many of the committee's recommendations regarding health insurance coverage, group medical practice, and community health centers would come to fruition in the second half of the 20th century.

History

After a meeting on medical economics at the American Medical Association's (AMA's) annual convention in 1926, where several delegates discussed healthcare reform, a small group was convened to explore these issues in greater depth. This initial group, referred to as the Committee of Five, included Winford H. Smith from Johns Hopkins Hospital; Llewellyn F. Barker from the Johns Hopkins Medical School; Walton H. Hamilton, an economics professor from the Brookings Institution; C. E. A. Winslow, a public health professor from Yale University; and Michael M. Davis, who was previously the director of the Boston Dispensary and a well-known author on the sociological aspects of healthcare. Harry M. Moore, who served as an economist for the U.S. Public Health Service, was appointed secretary, although he was not a formal member of the committee. Smith served as the chairman of this group.

This group asked Ray Lyman Wilbur, president of Stanford University and a past president of the AMA, to preside over the meeting at the 1927 annual convention of the AMA. The Committee on the Cost of Health Care (CCHC) was formed following this meeting, and Wilbur was appointed to serve as chairperson. Moore was appointed the director of research, assuming research oversight and administrative responsibilities.

The CCMC, an independent entity, received funding from private philanthropic sources for its research and administrative costs. Specifically, the Carnegie Corporation, Josiah Macy, Jr. Foundation, Milbank Memorial Fund, New York Foundation, Rockefeller Foundation, Julius Rosenwald Fund, Russell Sage Foundation, and Twentieth Century Fund contributed a total of nearly \$1 million to the committee. This financial support allowed the committee to delve into issues concerning the affordability of medical care for Americans, the training and earnings of medical professionals, and the distribution of health resources in the nation.

In 1928, Isidore S. Falk, a young medical researcher, joined the CCMC to serve as its associated director of studies. His involvement was key to the prolific nature of the committee's publications, reports, and collaborations. The committee officially changed its name in 1930, becoming the Committee on the Costs of Medical Care, this new title reflecting the multitude of financial factors beyond the expenses associated with physicians that affect medical care.

Final Report: Findings and Majority Recommendations

The CCMC's final report detailed many of its findings over the 5 years that it was in existence. The report found that in 1929, the national health expenditures totaled \$3.7 billion, representing 4% of the nation's gross domestic product (GDP) and \$30 per individual and \$123 per family. It also found that only 60% of the nation's population was responsible for these costs, the majority of which were paid directly by patients and their families; that less than 60% of the nation's counties had a hospital; that half of the population visited a physician each year; that only 20% of the population received dental care annually; that many poor Americans could not afford adequate medical and dental services; and that the middle class was not able to pay for the expenses of a major illness. The report also found that physicians' salaries varied across geographic regions and that one third of general practitioners earned less than \$2,500 per year.

In its majority report, the CCMC presented five recommendations to address the economic issues of

the nation's healthcare system. First, it advocated for group practice between physicians and dentists in a hospital setting and the development of community health centers. Second, it proposed the expansion of public health services, especially at the state and local levels. Third, it recommended group payment for healthcare, calling for health insurance coverage to be provided by private sources, government, or a combination of both; it did not specify the type of insurance mechanism because a few members advocated for universal compulsory coverage, while others endorsed voluntary insurance schemes. Fourth, it called for stronger coordination of medical and health services, proposing the establishment of state and local agencies to study and evaluate these services. Last, it proposed improving the education and training of medical professionals, including physicians, nurses, dentists, pharmacists, and healthcare administrators.

Final Report: Minority Reports

The CCMC's final report contained two minority reports. While the first minority report agreed with the majority report on extending public health services, improving medical education, and coordinating medical services better, it strongly opposed the group practice and group payment recommendations. The first minority report felt that group practice would encourage contract practice and commercialization. Moreover, several signers of the first minority report disagreed with the proposal for voluntary group health insurance because they believed that it would lead to a compulsory healthcare system. Specifically, the first minority recommendations were as follows: Limit the government's medical activities to care for the indigent, government institutions, public health, and veteran's affairs; expand government care of the indigent, relieving the burden on medical professionals to provide charity care; improve coordination of services; restore the role of the general practitioner to the center of medical practice; eliminate the corporate practice of medicine; and examine and tailor payment methods to fit institutions and practices. Eight members of the CCMC signed the first minority report, seven of whom were physicians.

The second minority report, signed by two dentists, agreed with much of the majority report but

raised issues with the development of community health centers and the inadequate understanding of problems within dental group practice.

Two members of the CCMC did not join any report; instead they wrote personal statements—one called for compulsory insurance coverage, while the other expressed dissatisfaction with the committee's ability to deal with the fundamental economic question brought before the group.

Criticism

The AMA strongly opposed the majority report's endorsements of voluntary health insurance and group medical practice, launching an attack on its efforts. The AMA supported the first minority report and encouraged its membership to do the same. In addition to mainstream media headlines calling the CCMC's stance on group payment "socialized medicine," editorials appeared in the *Journal of the American Medical Association* that described it as "Sovietism." Local medical societies also criticized the majority recommendations and endorsed the first minority report.

Future Implications

The CCMC's efforts helped the emergence of private health insurance and eventually the federal Medicare and Medicaid programs. The committee's promotion of group medical practice can also be seen in present-day managed-care organizations and the large number of community health centers in the nation. Its emphasis on the need for national data collection systems to monitor trends in healthcare will eventually be accomplished by the National Center for Health Statistics (NCHS) and other federal agencies. Finally, the committee significantly contributed to the growth of the field of health services research, training a number of distinguished health economists, healthcare administrators, and public policymakers.

Kathryn Langley

See also American Medical Association (AMA); Blue Cross and Blue Shield; Cost of Healthcare; Davis, Michael M.; Health Economics; Health Insurance; Medical Group Practice; Rorem, C. Rufus

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COMMONWEALTH FUND

The Commonwealth Fund is a large New York City-based, private, nonpartisan foundation that supports independent research on healthcare issues and provides grants to help improve healthcare practice and policy. The Commonwealth Fund's mission is to promote a healthcare system with better access, improved quality, and greater efficiency, especially for those most vulnerable in our society—low-income individuals, children, the uninsured, minorities, and the elderly.

History

In 1918, Anna M. Harkness founded the Commonwealth Fund with the broad mandate that it should do something that would benefit the welfare of mankind. The foundation was initially

endowed with a gift of nearly \$10 million. Edward Harkness, Anna M. Harkness's son, was the fund's first president. Both Edward and his mother were committed to building a responsive and socially concerned philanthropy, donating generously to the fund's endowment over the years. In fact, between 1918 and 1959, the Harkness family endowed more than \$53 million to the fund.

From the 1920s through the 1940s, the fund helped develop the field of child guidance and supported public health departments in communities around the country, and the construction of rural hospitals. In 1925, the fund launched the Commonwealth Fund Fellowships, an international program that brought young professionals to the United States for extended studies and travel. The Commonwealth Fund Fellowships later became known as the Harkness Fellowships.

After World War II and into the 1980s, the fund concentrated on addressing the needs of communities that lacked healthcare services. It did so in several ways: The fund assisted in developing new medical schools, which addressed the issue of physician shortage, and medical school curricula. It also contributed to bringing healthcare to underserved communities, including troubled urban areas. The fund played a role in bringing attention to the problems facing elderly Americans as well as those faced by academic health centers. In addition, the fund helped stimulate several programs and movements, including youth-mentoring programs and the patient-centered care movement of the 1980s.

Since 1995, the Commonwealth Fund has focused on healthcare issues, specifically health insurance coverage, access to care, and improving healthcare quality and efficiency. Through its international base, the fund is able to encourage communication and collaborations on health policies and practices among developed countries.

As was the Harkness family's intent, the Commonwealth Fund has sought to identify promising practices and solutions that could help the United States achieve a high-performing healthcare system.

Activities

The fund operates programs in the following areas: healthcare quality improvement and efficiency,

future of health insurance, Medicare's future, high-performance health system, patient-centered primary care, state innovations, quality of care for underserved populations, child development and preventive care, quality of care for frail elders, minority health policy, and health policy and practice. Additionally, the fund administers several fellowship programs, including the Commonwealth Fund/Harvard University Fellowship in Minority Health Policy, Harkness Fellowship in Health Care Policy, Packer Policy Fellowship, Australian-American Health Policy Fellowship, and the Ian Axford Fellowship in Policy. The Commonwealth Fund also disseminates information, knowledge, and experience—all in an effort to influence policymakers to achieve the fund's goal of a high-performing healthcare system.

Grants and Publications

The Commonwealth Fund has not only been a grant maker but also a professional publisher. The fund's professional staff works with its grant recipients to develop and implement projects and communicate project results. The fund also develops and publishes books, reports, and other material that inform clinicians, healthcare administrators, and the public about the fund's research and ways to achieve a better healthcare system.

Each year, the Commonwealth Fund produces numerous scholarly publications, written by the fund's grant recipients, staff, and invited experts—all of which are available on the Commonwealth Fund Web site free of charge. In addition, each year fund staff and grantees publish articles in peer-reviewed journals. The fund ensures the quality of its publications through internal peer review and sometimes independent external peer review.

The Commonwealth Fund continues to seek out ways to improve the quality, efficiency, and access to America's healthcare system. By bringing health services research and health policy together and continuing its mission of promoting a high-performing healthcare system, the fund will likely have a sustained impact on the access, costs, and quality of healthcare for all Americans.

Lubina Perez

See also Access to Healthcare; Davis, Karen; Healthcare Reform; Health Insurance; National Health Insurance; Public Policy; Uninsured Individuals; Vulnerable Populations

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COMMUNITY-BASED PARTICIPATORY RESEARCH (CBPR)

Community-based participatory research (CBPR) is a collaborative research approach that directly and equitably links researchers and communities to jointly study an issue. A key feature of CBPR is the recognition that researchers and communities each bring unique strengths and perspectives to the research process, enabling a combination of

knowledge and action to achieve social change. In the health services research arena, this achievement often leads to improved health outcomes and reduced health disparities.

The CBPR model serves to establish a structure within which community and academic participants work together to achieve a balanced set of research methods, tools, and priorities. When members of communities affected by the issue being studied are invited to participate in the research process, they are given unique opportunities to influence their surroundings. As a result, the CBPR approach is a powerful means of satisfying the rigors of scientific research and addressing the needs of the communities involved—communities that often consist of underserved and marginalized individuals.

History

CBPR is rooted within social psychologist Kurt Lewin's "action research" school, which rejected traditional notions that objectivity could only be achieved by removing oneself from the community of interest. In the 1940s, Lewin's research focused on creating mutually beneficial relationships between researcher and community and helping community leaders use research data to achieve social change. Lewin's approach emphasized a continuous cycle of planning, action, reflection, and decision making that resembles a spiral of cascading steps.

In the first step, a general issue is identified. Part of what makes the action research approach inherently unique is the belief that this initial issue should come from the community of interest itself, rather than from academia. The results of this community involvement from the start include a community's sense of empowerment, trust in the research team, and investment in the project itself.

The next step is a careful examination of the issue within the context of the community, from which comes an overall plan to guide the research. Action is taken in the next step, after which an evaluation occurs. Whether formal or informal, the evaluation usually results in a revision of the plan and additional action steps, and the cycle continues with the constant reciprocation between researcher and community.

In the 1970s, early examples of participatory research in action appeared in several developing nations, where scholars such as Brazilian educator Paulo Freire rejected “colonial” research methods in favor of more community-oriented ones. Freire’s approach built on the critical pedagogy he put forward as a response to the traditional formal models of education in Latin America. Using the same continuous cycle of steps employed by Lewin, Freire examined the process of learning as a way to stimulate critical thinking and raise students’ critical awareness of their environment. Inherently political in nature, his approach triggered social changes that reduced the divide between the powerful and the marginalized.

In 1984, the Centers for Disease Control and Prevention (CDC) established the Prevention Research Centers (PRC) Program, a network of academic researchers, public health agencies, and community members that conducts applied research in disease prevention and control. The CDC set forth four core values in keeping with the fundamental goals of the CBPR: respect, trust, integrity, and accountability. Key activities of the PRC Program include establishment of multidisciplinary research teams, creation of research networks for priority health issues, generation of long-term relationships for engaging communities as partners in research, and development of public health researchers’ skills for working with communities. There are currently more than 30 PRCs located in schools of public health and medicine, enabling academic researchers to easily identify and partner with public health agencies and communities. In 1997, the Institute of Medicine (IOM) recommended CBPR as one of eight new areas in public health education.

In recent years, the focus of CBPR has shifted from disease identification and management to prevention and education. Rooted in action research and evolving through programs set forth by Freire, the CDC, and the IOM, CBPR has become a widely accepted and respected approach to health services research.

Community-Based Participatory Research Approach

CBPR is not an explicit methodology but an approach to applied research that may combine

both qualitative and quantitative components. The concept of “empowerment” within the participating community and its members is a major factor in the discrimination between CBPR and more traditional methods.

The primary principle of CBPR is that the community be actively and continuously involved in all aspects of the project. As a result of this collaborative partnership, the research belongs jointly to the researchers and the community, and all parties mutually benefit from the results. Additional core principles of the CBPR approach include reciprocal transfer of expertise among all research partners, shared resources and decision-making power, and mutual ownership of the results. These are usually facilitated by mutual respect between community and researchers, clear and open communication, adherence to ethical standards, credit for participation as appropriate, and long-term commitment to the project.

Both community and researcher must have the capacity and the empowerment to express needs and goals as they pertain to the research at hand. The true partnership required by a rigorous CBPR approach is one that combines knowledge with action to achieve the goal of improved health outcomes and reduced health disparities.

A successful CBPR project is focused locally on the relevance of the health issue at hand and the geographic, cultural, and socioeconomic contributions to it. Such a project recognizes the community’s resources and knowledge and incorporates them into the research process. In turn, the knowledge and resource bases of the community will be bolstered by participation in the project and the dissemination of its results in the interest of improving social practice and community health.

Implementation and Best Practices

As part of the reciprocation of expertise between researcher and community, a mechanism must be created for shared decision making. This often requires formation of a community advisory board, a task force, or various planning and implementation committees. These bodies develop and adhere to guiding principles for collaboration within the particular community involved.

Throughout the project, the collaboration should be evaluated by both the researcher and the

community. The research team should remain aware and respectful of the community's needs and priorities, and emergent problems and concerns should be addressed. Incorporation of feedback loops into the project's design can help ensure proper collaboration, reflection, and relevance throughout the intervention.

A CBPR project often begins with an issue or question brought forth by a community. Inviting the community to identify health-related issues of greatest importance to them may increase motivation to participate in the research process. As with most health services research projects, the issue must be one for which epidemiologic data exist or can be gathered, and funding sources must be identified. Many CBPR projects incorporate educational "workshops" during which both researchers and communities explore each other's resources and strengths. Interviews with community members may be used to discover concerns about research and participation and may also be used to alleviate those concerns.

During the study design phase, community representatives work closely with investigators to achieve an optimal balance between scientific rigor and community acceptability. Community representatives are critical to the development of participant recruitment and retention strategies as they are attuned to the needs and desires of community members. The study must also be designed to remove existing and potential barriers to community participation. Measurement instruments should be developed with continued guidance from community members to increase the reliability and validity of the measures and to present research questions in a manner acceptable and accessible to the community.

As the project is implemented, community members continue to assist researchers with determining the cultural and social relevance of the intervention. Doing so increases the likelihood of achieving social change as a result. Finally, the community is involved with the interpretation and dissemination of findings and their translation into practice.

Before submitting manuscripts or making presentations at conferences, the research team should discuss findings with the study's shared decision-making body. Results should be framed in such a way as to limit potential "blame" for any negative

findings, and results should be communicated openly, even when they may be considered undesirable.

Major Benefits and Challenges

Benefits

In many communities that are the focus of research projects—often underserved populations—contact with researchers occurs solely during data collection. As a result, communities may become resentful or distrustful of the research community, and future participation becomes unlikely. However, the CBPR approach requires that a relationship be formed on the basis of respect and trust before the research begins and be maintained throughout the process and beyond.

CBPR may also be useful in developing and testing quantitative measures for use within certain populations and cultures. Through the community's involvement in the design and testing phases of an instrument, researchers may gain an insight into the cultural sensitivities and preferences of the community, leading to more appropriately designed and implemented methods with improved internal validity. This insight is also inherently useful in the analysis and interpretation of the results due to the "insider" perspective presented by the community members involved in the project.

Another major benefit of the CBPR approach for investigators is that the results may be disseminated almost immediately and are sustainable due to the continuous involvement and feedback from community members. This unique aspect of CBPR strikes a balance between research and practice that is rarely found in a traditional empirical study.

Challenges

CBPR has gained a great deal of acceptance among public health researchers and practitioners in recent years. However, unlike more traditional research methodologies, there is a great deal of variation in methodologies and reporting requirements, leading to a gap in the ability of researchers to compare such studies.

Although the ideal start to a CBPR project is one in which a community brings an issue or problem to the attention of researchers, there are often numerous real and perceived barriers to doing so.

Many communities that may benefit from a CBPR project are distrustful of researchers or simply do not know how to access them. If the investigators broach the CBPR issue with the community, they are wise to assess the true importance of the issue within the community. Active participation is maximized when both the community and the researcher are fully invested in the issue or problem and are committed to addressing it together. To achieve this, incentives for both community members and the research team must be adequate.

Even when both parties are fully committed to the research, some degree of division between them may still exist. The researcher must overcome his or her role as an “outsider” to truly collaborate with the community. This can be a significant barrier when a community’s members are extremely marginalized and are unlikely to identify the investigators as anything but outsiders—often with perceived knowledge and power. Such barriers can be ameliorated through involvement with community leaders in the initial stages of the project. Elders, religious leaders, and others in either real or perceived roles of power within their communities provide excellent opportunities for investigators to gain a benevolent foothold in the community. Identification of appropriate representatives may also prove challenging. A selection bias may occur if participating community members are not representative of the community’s overall makeup.

As in any research endeavor, researchers and communities must concern themselves with the issues of ownership and confidentiality. Because investigators work so closely with the communities and individuals, ethical issues may arise as relationships evolve. Discussions early in the process about these issues and how they will be addressed can alleviate the tension with regard to these issues.

Because CBPR relies on robust relationships with communities, the investments of time and resources can be large for both researcher and community. Such relationships must be properly brokered, equitably managed, and carefully sustained to maintain the ideal partnership without unfairly burdening one party. Finally, because of the relatively recent acceptance of CBPR as an empirical method, funding mechanisms can be scarce and inadequate.

Examples

REACH

The CDC’s Racial and Ethnic Approaches to Community Health (REACH) program is the cornerstone of its efforts to eliminate racial and ethnic health disparities as part of the Healthy People 2010 initiative. The strategic goals of REACH are to address health disparities in critical life stages using innovative approaches within communities, healthcare settings, schools and after-school programs, and workplaces.

Communities of focus include African Americans, Alaska Natives and American Indians, Asian Americans, Hispanic Americans, and Pacific Islanders. The six areas targeted for elimination of disparities are (1) infant mortality, (2) breast and cervical cancers, (3) cardiovascular diseases, (4) diabetes, (5) HIV/AIDS, and (6) immunizations.

REACH grantees are implementing local interventions that include continuing education for healthcare providers, health education and health promotion programs that use lay health workers to reach community members, and health communication campaigns. Evaluation of the REACH program includes gathering evidence on community capacity building, targeted intervention actions, community and system changes, widespread behavior changes, and reduction in health disparities.

California’s Health Interview Survey

California’s Health Interview Survey, the nation’s largest state health survey, represents a successful combination of CBPR with traditional quantitative research. At the start of each survey development cycle, more than 145 individuals from state and local policy-making bodies, public health agencies, advocacy groups, research organizations, and healthcare organizations collaborate with survey research staff as members of advisory boards, technical advisory committees, and work groups. This collaboration shapes topics, measures, and the design of the survey, and survey results and data are provided to the communities involved.

*Environmental Justice:
Partnerships for Communication Program*

A partnership between several federal agencies led to the 1994 launch of the Environmental Justice: Partnerships for Communication Program. The program was designed to bring together community organizations, environmental health researchers, and healthcare professionals to develop models and approaches, build communication, and increase community participation in research.

More than 30 CBPR studies have been funded under the program. For example, the Partnership to Reduce Asthma and Obesity in Latino Schools focuses on developing a better understanding of the impact on asthma and obesity of the school environment and school district policies that influence this environment. The Environmental Health and Justice in Norton Sound, Alaska, is a program funded to identify, limit, and reduce the effects of harmful contaminants in the natural food sources of indigenous people in Alaska. The Community-Based Participatory Research in Environmental Health program, based at the University of Texas at El Paso, seeks to improve the capacity of the El Paso, Texas/Juarez, Mexico, binational community to participate in research on lead exposure among low-income Hispanic children.

Future Implications

As more comprehensive approaches to public health research continue to gain traction in the scientific and academic communities, attention and resources will increasingly focus on CBPR. Public health agencies, seeking to reduce health risks and improve outcomes effectively and efficiently, are calling for more participatory studies. The shift of research focus in recent years from disease identification and management to prevention and education has attracted the attention of both private and governmental organizations. These funding agencies are beginning to require community partnerships in their requests for applications and proposals. In addition, top-tier health services research journals will likely increase the number of CBPR-related articles published, continuing to lend credence to the scientific rigors of this approach.

Additional types of community partnerships and additional underserved communities will continue to be explored. A standardized set of competencies, terminologies, quality assessments, and well-defined outcome measures must be established for CBPR to remain a viable approach to rigorous research. New investigators will be educated about the CBPR approach and its applications, benefits, and challenges. Similarly, communities will be educated about the opportunities available for their participation in CBPR. Tools to help communities locate and contact potential research partners are being developed and implemented, increasing the scope of CBPR.

Expansion of CBPR policies will allow more communities to become involved with researchers in the interest of bettering the health of their members. Communities previously excluded from CBPR and traditional research will benefit from a narrow focus, which will allow specific attention and collaboration to decrease disparities and increase participation in health-related activities.

Finally, the results of CBPR must move from local dissemination and action into policy and practice. Engaging community members in the policy process will increase the joint ownership of the research, and putting the results into practice will allow similar communities to benefit from the results.

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See also Agency for Healthcare Research and Quality (AHRQ); Centers for Disease Control and Prevention (CDC); Community Health; Epidemiology; Health Disparities; Kellogg Foundation; Public Health; Public Policy

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- American Public Health Association (APHA): <http://www.apha.org>
- National Institute of Environmental Health Sciences (NIEHS): <http://www.niehs.nih.gov>
- Prevention Research Centers (PRC): <http://www.cdc.gov/prc>

COMMUNITY HEALTH

Although community health is a popular concept, it lacks a clear working definition in research and practice. One reason is that the concept of community health belongs to multiple disciplines, including public health, medicine, and psychology. An inherently interdisciplinary concept, community health has no one home; however, common elements can be found across disciplines in terms of how it is discussed. Throughout these discussions, community health has been presented as a conceptual framework that can be applied to understand health, a process by which health interventions can be designed and implemented, and an outcome with implications for measurement.

Community Health as a Conceptual Framework

As a conceptual framework, community health offers a view of health as the product of individual

and extra-individual factors. This framework moves beyond a traditional focus on person-level factors and reframes both causes of disease and sources of health as interactions between individuals and their social and physical environments. Community health as a perspective is a relatively new concept. The time since 1980 has been cited as seeing enormous growth in the awareness of the need to attend to environmental causes of health. Rather than focusing only on modifying individual behavior, a community health perspective prescribes both behavior- and environmental-based strategies. The rise of this perspective has been credited to the acknowledgment that most public health problems are too complex to be understood simply as a product of individual behavior.

Possibly because of its interdisciplinary nature and lack of one core disciplinary home, the concept of community health is still in its formative stage. In discussing community health as a conceptual framework, researchers have referred to two similar, more established frameworks, including the socioecological model and empowerment theory. Both of these perspectives are based on the assumption that individual and environmental factors come together to influence health and illness, and both offer a set of principles guiding the approach to understanding health and disease, preventing disease, and promoting health.

The socioecological model specifies the following three assumptions: (1) environmental settings have multiple physical, social, and cultural dimensions that affect a variety of individual physical, emotional, mental, and social health outcomes; (2) individual characteristics such as genetics, psychological characteristics, and behavior affect health and, moreover, interact with the environment to affect individual outcomes; and (3) the variety of diverse settings within an individual's life interact to affect health. Community health has ecological roots and similarly views individuals as being nested within a series of embedded systems that are interrelated and interdependent. These systems range from social dynamics to physical organizations and can include families, neighborhood groups, schools, places of worship, government policies, and both explicit and unspoken prejudices. A community health perspective acknowledges the dynamic interaction between the systems in which individuals exist and acknowledges the

importance of both systems being able to effectively meet the needs of individuals, and individuals effectively accessing systems of support. A community health perspective sees the effective functioning of these systems as vital to the health of individuals.

Empowerment theory views health as the product of an individual's social, economic, and environmental condition. Using an approach slightly different from the socioecological model, empowerment theory has at its core the need for authentic involvement of community members throughout the process of understanding the contributors to health and disease, and ultimately promoting health. Empowerment theory states that different groups in a society hold different levels of power and that this power affects the control that individuals have over their own health. Under this framework, community health stems directly from the ability of individuals to be involved in decision making in their communities. Empowerment advocates for the creation of more comprehensive networks of support and views healthy relationships between a community and other effective organizations as critical—organizations such as criminal justice systems, school systems, and healthcare providers. Participation is essential to this process as community members are vital to building and maintaining relationships across healthy settings.

Though differing in their approaches to promoting health, these models demonstrate the key assumptions of a community health framework: the recognition of individual and environmental causes of health, a focus on the interaction between individual and environmental factors, and an acknowledgment of the importance of including community members in the process.

Community Health as Process

Researchers and theorists have also discussed community health as a process, specifically focusing on approaches to intervention. The presumption of health as being defined by both individual and environmental factors necessitates changing not only individual behavior but also those social factors causing disease or preventing optimum health. A community health framework positions community-level intervention as a distinct

approach to keeping individuals healthy: The environment can be a protective factor for individual health. Opportunities afforded (or not afforded) by the environment are essential to the health and well-being of an individual. In the reframing of health and disease as interactions between individuals and environments, strategies such as self-help, community development, and social action have been discussed as being key to community health practice. Central to this process is the concept of collaborative practice.

A community health framework advocates collaboration both among individual members of the community and among various community systems. The process of community health involves the mobilization of community members to work collectively on their own behalf; there is an explicit focus on capacity building, which involves the sharing of information, skills, and resources to organize community members into leadership roles. Community members are involved in the process of understanding the contributors to health and disease, as well as the delivery of health interventions. Community health acknowledges that no one knows the community better than its members; as a result, these individuals can play an important part in recognizing barriers to health in their communities as well as making decisions about how to address these barriers. These collaborations can lead to more authentic, effective, and sustainable interventions.

Collaboration among community organizations provides an overall environment of care for individuals. Because this step can appear more daunting than the task of involving individual community members in the health promotion process, efforts have often fallen short of coordinating various needed systems to create healthy systems of care. Calls have been made for better integration among community organizations as essential to facilitating the health of community members, and research has begun to demonstrate that organizational and environmental infrastructure and support are essential to the effectiveness of health-related programming. However, more needs to be done. A community health approach advocates for a series of systems that provide what is needed for a diverse group of individuals to stay healthy: healthcare systems that reach out to multiple groups of people in culturally appropriate ways,

educational systems that meet the needs of a diverse group of learners, employment and recreational opportunities for those with varying ability levels, opportunities for the building of social connections and exchange of social support, and neighborhood environments that promote physical safety and protection from environmental pollutants. To be effective, a key requirement is that these systems should work in concert with each other, offering multiple opportunities for person-environment fit, in that individual needs and resources are complemented by the multiple environments in which a person lives.

A number of efforts have been made to lay the groundwork for community health practice. For example, in the early 1990s, the Minnesota Heart Health Program developed an intervention to foster heart health in three communities. It began with a survey intended to identify community leaders who would then be asked to become members of an advisory board with government officials and health professionals to provide guidance on programs, health education campaigns, and related policy. This effort resulted in a public education media campaign and a number of programs involving multiple organizations in the community, including school curricula on smoking, exercise, and nutrition; and an annual communitywide quit smoking contest and work site smoking policy planning assistance. An evaluation of the program demonstrated greater participation in heart disease health promotion and a greater sense of "social connectedness," although more so among stable organizations whose current needs and interests were in line with the goals of the intervention.

A number of guidelines for community health promotion programs have been developed. Many emphasize the importance of understanding the relevant aspect of the social and physical environment, which can influence a variety of health outcomes, as well as the interactions between these environmental characteristics and pertinent individual factors. Once these factors and interactions are better understood, interventions can be developed to enhance the person-environment fit, which can occur when individuals enjoy a high degree of control over their environment and are able to modify it according to their needs. Interventions can therefore work to facilitate the flexibility and responsiveness of social and physical environments.

An important part of health promotion programs not mentioned is the need to teach individuals to be aware of and advocate for the types of settings and setting characteristics that they need.

Community Health as an Outcome

Community health can also be discussed as an outcome. What does a healthy community look like? Following from the above, a healthy community is free from physical violence, environmental pollutants, disease, and discrimination. Furthermore, it is one in which community members are active and involved in decision-making processes, systems of care are coordinated and accessible to all community members, and multiple opportunities are available for person-environment fit. A healthy community focuses on keeping its members healthy through disease prevention and health promotion as well as providing effective treatment for those who are sick. These are but some of the characteristics that operationalize the theory and process presented above.

In addition to discussing how to achieve these outcomes, it is also important to discuss how such outcomes can be monitored and measured. The measurement of community health presents a challenge because of the complexity of the concept. The fact that community health views health as an interaction between individual, social, and physical environmental factors necessitates the measurement of at least three constructs: (1) individuals, (2) the environment, and (3) the interaction between them. Currently, the most sophisticated measures are available for individual-level constructs. For measurements of individual outcomes, morbidity and mortality rates can be computed, which permit a picture of the health of a group of people to be obtained. For example, mortality rates from heart disease, cancer, and stroke can be used to assess the physical health of a community. Examining these rates can be helpful in understanding trends in health and disease, particularly in understanding health disparities between subgroups of the population.

Techniques related to both environmental assessment and the measurement of individual-environment interactions need further development; however, strides have been made regarding extraindividual assessment. Environmental assessments developed

to date can be divided into two broad categories: (1) those that assess the environment subjectively (i.e., from the perspective of individuals assessing that environment) and (2) those that assess the environment more objectively. Examples of the former include the variety of environmental scales developed that allow individuals to rate their satisfaction with different aspects of their environment. Such measures have been adapted to classrooms, family environments, and work settings. Examples of the latter involve counting up the number of businesses in a community with handicap-accessible entrances or the number of available health clinics in a community. Each of these broad classes of measurement provides important information about the environment, with the subjective measures actually providing some information about the interaction between an individual and his or her environment and the objective measures providing information about the environment that perhaps individual community members cannot observe or will not report. Ideally, these measurement strategies should be used to complement each other in describing the environment.

Finally, efforts must be made at assessing the interaction between individuals and the environment to understand how it affects health. In addition to the subjective environmental measures discussed above, measures of the individual and environmental components of community competence can also assist in approximating this interaction. Community competence involves two components: (1) the competence of community resources in meeting the needs of individual community members and (2) the competence of individuals in accessing these resources. Assessing the first component involves measuring the effectiveness of various social systems, for example, the healthcare, education, employment training, housing, and criminal justice systems. Evaluation research has made strides in developing methodologies for assessing the process and outcomes of such service delivery systems. Assessing the second component involves measuring an individual's ability to effectively use resources in the community. Viewing results of both types of assessments can begin to uncover the level of fit between individuals and their communities.

The task of measuring these multiple components can become overwhelming, particularly as multiple methods (e.g., surveys, observations, and

health records) are necessary for capturing the multiple components and levels of analyses involved in the health equation. How then can variables be identified for study? How can health professionals and researchers decide on a course of action in intervention? One approach is to use strategies based on "middle-range" theories of the variety of factors that contribute to and are likely to alleviate a particular health problem. Assessing and attempting to either eliminate or bolster a set of variables thought to affect the condition in question provides a productive start to understanding health.

Future Implications

The concept of community health advocates for health as the product of the individual and his or her environment. A community health approach involves enhancing the environment to become more health promoting as a way to facilitate individual health. One vehicle for action includes public health policy. Each of the different levels of community health—framework, process, and outcome—includes a number of overlapping implications for public health policy.

Working within a community health framework, public health policymakers must acknowledge and address individual and environmental factors, and the interaction between them, as the determinants of health. The community health perspective broadens what is considered "public health" policy because every aspect of society potentially affects health. Public health policy should therefore focus not only on topics that are clearly related to health but also those whose linkages may not be as explicit. Examples include promoting community development, creating safe communities with functioning resources, and allocating resources in such a way to build a solid infrastructure both within and between communities for health-promoting initiatives to thrive. Policy around the implementation of services and programs should mandate a thorough assessment of the local community resources and needs, building on the former to address the latter. Furthermore, policies across the board should promote citizen participation: Authentic opportunities for community members to be involved in making decisions about their communities should be built in as an

essential part of the process. An understanding of the relevant individual and environmental characteristics affecting health is critical to beginning any type of policy initiative.

Community health provides a conceptual framework, a set of intervention guidelines, and outcomes to target by understanding health as a product of individual and environmental factors. Because community health is a relatively new concept, the specific mechanisms by which environments interact with individual factors in affecting individual health have not been understood well. Further work must continue to identify the process by which these interactions occur and foster health promoting communities to positively affect the health of individual community members.

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See also Disease; Epidemiology; Health; Health Disparities; Health Planning; Medical Sociology; Preventive Care; Public Health

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National Rural Health Association (NRHA):
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World Health Organization (WHO): <http://www.who.int>

COMMUNITY HEALTH CENTERS (CHCs)

Community health centers (CHCs), called neighborhood health centers until 1975, were created in 1964 by the U.S. Office of Economic Opportunity (OEO) as a component of President Lyndon Johnson's "War on Poverty." These local, public or nonprofit, community-run healthcare centers serve low-income and medically underserved communities. Community health centers provide comprehensive, affordable primary care and preventive visits. Many of these centers provide services such as case management, home visits, community outreach, dental care, diagnostic laboratory and radiology services, and pharmaceutical, mental health, and substance abuse services. Currently, more than 1,000 community, migrant, and homeless health centers serve more than 15 million people in the United States, about half in rural communities and half in economically depressed inner-city communities. Two thirds of health center patients are members of racial and ethnic minority groups, and 29% are reported as best served in a language other than English. More than 90% of health center patients are low income, and 71% have family incomes at or below the federal poverty level. About 40% of patients are uninsured, and 36% are covered by Medicaid.

Early Health Centers

Precursors to CHCs included 19th-century dispensaries, turn-of-the-century settlement houses, rural outreach efforts such as the Frontier Nursing Service in eastern Kentucky, city-operated clinics, and social medicine departments of progressive institutions such as Montefiore Hospital in New

York City. During the first two decades of the 20th century, health centers, which coordinated the health, welfare, and recreational services of multiple agencies in one location, were established in many cities in the United States. They focused on preventing disease through education, maternal and child healthcare, food inspection, and immunization. By 1926, there were more than 1,000 of these health centers across the country. By offering only preventive services, they avoided competition with the therapeutic services of private practitioners. Organized medicine opposed and defeated a proposed bill in New York State in 1920 that would have established and funded health centers throughout the state to provide both preventive and therapeutic services to laborers.

In 1920, the Rockefeller Foundation formed the Committee on Dispensary Development, directed by Michael M. Davis, which gave grants to “new concepts in ambulatory care.” One of the demonstration projects was a clinic at Cornell Medical School, which employed salaried physicians in a group practice, provided comprehensive ambulatory care services, and used a sliding-scale system for payment. During the 1940s and 1950s, patients who could not afford the cost of private physicians mostly relied on hospital outpatient departments or emergency rooms.

In 1960, the Social Security Act was amended with the passage of the Kerr-Mills measure, which provided states with grant money for the medically indigent. The Migrant Health Act of 1962 called for the development of health clinics dedicated to providing a broad array of medical and support services to farm workers and their families.

Establishment of Community Health Centers

Under the Economic Opportunity Act of 1964's Community Action Program, hospitals, medical schools, community groups, and health departments received grants to plan and administer neighborhood health centers in low-income areas. Health center advocates hoped that, in addition to providing high-quality healthcare to low-income populations that lacked access to such care, health centers would serve as a model for the reorganization of healthcare services for the nation's population as a whole.

One of the early leaders of the community health center movement was H. Jack Geiger, a young physician and civil rights activist, who had studied with Sidney and Emily Kark in South Africa and witnessed how a community-oriented primary-care model had improved the health of the Zulus. In 1964, while serving as Mississippi field coordinator with the Medical Committee for Human Rights, he recruited physicians and nurses to take care of the civil rights workers as well as the local population. Count Gibson, the chair of the Preventive and Community Medicine department at Tufts Medical School, was one of the volunteers in Mississippi. Working with the OEO, Geiger and Gibson founded the first two neighborhood health center demonstration projects. The first was established at the Columbia Point public housing project in Boston in 1965, and the other was built in Mound Bayou, Mississippi, in 1967. At these model health centers, teams of health professionals provided personal healthcare in convenient locations, with a focus on community outreach, child care, transportation, attention to the economic and environmental factors that contributed to poor health, and involvement of the patients themselves in how the programs were set up and managed.

In 1966, the Office of Comprehensive Health Services was established within the Community Action Program to administer neighborhood health center grants, and an Office of Health Affairs was created within the OEO to coordinate its medical and health programs. U.S. Senator Edward Kennedy of Massachusetts, an early supporter of the idea of health centers, helped secure the addition of authorizing language to the OEO Act in April 1967 that earmarked \$51 million for health centers. During the first 4 years of the program, medical schools and teaching hospitals received the majority of grants to start health centers. By 1971, 100 neighborhood health centers had been established under the federal Economic Opportunity Act.

While the OEO was funding neighborhood health centers, the U.S. Public Health Service (PHS), part of the Department of Health, Education and Welfare (DHEW), began providing its own grants to establish comprehensive health centers in low-income areas beginning in 1968. The PHS funded 24 centers in 1968 and 1969 through section 314(e)

of the Comprehensive Health Planning and Public Health Services Act of 1966, amended in 1967 by the Partnership for Health Amendments.

Community Health Centers After 1970

Under his New Federalism program, President Richard Nixon transferred OEO's operating responsibilities to the relevant cabinet agencies and moved the entire health center program in the early 1970s from the OEO to the DHEW's Public Health Service. In 1972, DHEW issued regulations asserting that federal support was no longer needed for the health centers as they could collect reimbursements from Medicare, Medicaid, and private insurers and become self-sufficient. In 1973, Nixon asked the U.S. Congress to phase out the legislation that funded health centers. However, the General Accounting Office (GAO) determined that Medicaid only covered about one third of the nation's poor, and in many states reimbursement rates were too low to cover health center costs. Congressmen Paul Rogers and Edward Kennedy led the effort to preserve federal funding for health centers and to broaden the mandate of the centers so that comprehensive primary and preventive services were provided to all patients who sought care. DHEW's Bureau of Community Health Services developed a system of accountability for the health centers that required each health center to report on numbers and types of staff, patients, and encounters as well as revenues and expenditures. Despite a veto by President Gerald Ford, the U.S. Congress authorized the Special Health Revenue Sharing Act of 1975. Title V of this act authorized \$215 million for health center operations in 1976 and \$235 million for 1977, plus an additional \$5 million each year for planning grants.

President Jimmy Carter and his DHEW secretary, Joe Califano, were strong supporters of increased funding for health centers. In 1978, education was moved to its own cabinet department, and DHEW changed its name to the Department of Health and Human Services (HHS). By 1980, there were 872 grantees, an increase from 158 grantees in 1974.

In the early 1980s, President Ronald Reagan, relying on advice from the conservative Heritage Foundation, which distrusted health centers as

potentially leading to a nationalized healthcare system, tried to combine health centers with other health programs into a primary-care block grant. However, opposition from individual health centers, state and regional primary-care associations, the National Association of Community Health Centers (NACHC), and senators Edward Kennedy and Orrin Hatch led to the 1986 repeal of the block grant. While there were overall funding cuts in the health center program during the early years of the Reagan administration, later the program experienced some growth due to increases in regular appropriations and temporary funds to help the centers meet rising demand from the unemployed. An increase of available healthcare providers from the National Health Service Corps, a program that pays for professional education in exchange for service in underserved areas, enabled many urban sites to expand.

During the George H. W. Bush administration, Senator John Chafee of Rhode Island and the NACHC helped develop the Federally Qualified Health Centers (FQHC) legislation, which increased health center reimbursement for Medicaid in 1989 and Medicare in 1990.

President Bill Clinton's Task Force on National Health Reform proposed to replace nearly all health programs with "purchasing cooperatives" or "health alliances." A background paper on healthcare for the underserved presented conflicting views on whether health centers should continue as a separate entity or be consolidated with insurance funds run by the purchasing cooperatives. After the White House Task Force was disbanded, the HHS proposed combining federal health programs and channeling the funds through states. When health center advocates protested this proposal, which recommended block grants similar to those of the Reagan years, the Clinton Health Security Act continued separate legislative authorities for programs such as health centers. Donna Shalala, the secretary of HHS, preferred "marrying the health centers to teaching hospitals" rather than expanding services provided by the health center. Between 1995 and 2001, the U.S. Congress increased health center appropriations 65% from \$757 million to \$1.2 billion.

President George W. Bush made expansion of health centers a top priority. In 2001, he launched the 5-year President's Health Care Expansion Initiative to establish or expand 1,200 health

center sites to serve an additional 6.1 million patients annually by the end of 2006. The U.S. Congress generally supported this effort until 2005, when it cut the proposed increase from \$219 to \$116 million as part of across-the-board cuts due to rising deficits. In 2006, health centers received only a \$48 million increase despite Bush's proposed \$304 million increase. Bush cited an Office of Management and Budget (OMB) report that reviewed hundreds of HHS programs and found health centers to be 1 of only 10 deserving the highest effectiveness rating.

The Health Resources and Services Administration (HRSA), Bureau of Primary Health Care (BPHC), currently administers the health center program within the HHS. The Health Centers Consolidation Act of 1996 combined the previously separate community, migrant, homeless, and public housing authorities under Section 330 of the Public Health Service Act (PHSA) to create the consolidated health centers program. The federal Health Care Safety Net Amendments of 2002 reauthorized the consolidated health centers program through 2006.

Financing

CHCs are funded by a variety of sources. Medicaid provides the greatest part of their revenues, accounting for 36% of total funding, followed by federal 330 grants, which cover 22%. The remainder comes from state and local funding, including foundations (12%), Medicare (6%), private insurance (6%), self-pay (6%), other federal grants (4%), and other sources (8%).

Four types of FQHCs are funded under Section 330 of the PHSA: (1) CHCs, under section 330[e], receive 81.5% of program funding; (2) migrant health centers, under section 330[g], account for 8.6% of program funding; (3) homeless health centers, under section 330[h], receive 8.7% of program funding; and (4) public housing health centers, under section 330[i], receive 1.2% of program funding. Federally Qualified Health Center Look-Alikes are health centers that meet the requirements for federal funding but do not receive a grant. FQHCs and Look-Alikes are eligible to receive enhanced reimbursement from Medicaid and Medicare and to participate in the 340B program, which allows them to purchase drugs at

reduced prices. FQHCs are paid by Medicaid and Medicare for services on a per-visit basis rather than separately for each service provided when a patient visits a health center. FQHCs also have access to medical malpractice insurance through the Federal Tort Claims Act.

Federal Grant Requirements

To receive Section 330 grant funds, a CHC must be located in a federally designated medically underserved area (MUA) or serve a federally designated medically underserved population (MUP). It must also have nonprofit, public, or tax-exempt status; provide comprehensive primary healthcare services, referrals, and other services needed to facilitate access to care, such as transportation, interpreter services, and case management. Additionally, the CHC must have a governing board, with a majority of members as patients of the health center, provide services to all patients in the service area regardless of their ability to pay, and offer a sliding fee scale based on family income.

The governing board, with at least a 51% consumer majority, must meet monthly to select the CHC's services and hours, approve the CHC's annual budget, select the CHC's director, and establish general policies.

In 2004, federally funded health center grantees provided care at 3,650 sites to more than 13.2 million patients. Federal grant funding for the consolidated health centers program totaled \$1.47 billion in 2003 and \$1.57 billion in 2004. Federal grants constitute 25% of overall health center revenues.

As health center grants are given to fund direct services, HRSA limits the use of grant money for capital-related purposes. From 1978 to 1996, health centers could use grant funds for construction, renovation, acquisition, and equipment purchases. However, the U.S. Congress revised the health center statute to prohibit the use of grant dollars for construction in 1996. Currently, HRSA allows grantees to use up to \$150,000 from their first year's budget for equipment or capital alterations. HRSA also provides a loan guarantee program to grantees and funds state primary-care associations and the National Association of Community Health Centers (NACHC) to provide technical assistance to CHCs.

Organizations

In 1970, the nonprofit National Association of Neighborhood Health Centers (NANHC), with support from the OEO, was founded with a mission to enhance and expand access to high-quality, community-responsive healthcare for America's medically underserved and uninsured. The same year, the New York Association of Neighborhood Health Centers and the Massachusetts League of Neighborhood Health Centers were also founded to pool each state's respective technical resources, train board and staff members, influence the development of DHEW regulations, and negotiate with the state government about the level of Medicaid reimbursement for health centers. Both of these groups received DHEW funding. In 1973, after the transfer of all health center programs to DHEW, the state groups gave up their individual grants and became subcontractors of the national association in an attempt to encourage the creation of additional regional associations to form a network of technical assistance groups.

In 2007, the NACHC represented a network of more than 1,000 FQHCs, serving 16 million people at 5,000 sites in all 50 states, Puerto Rico, the District of Columbia, the U.S. Virgin Islands, and Guam. The NACHC serves as the major source for information, data, research, and advocacy on key issues affecting community-based health centers and the delivery of healthcare for the medically underserved and uninsured in America. It provides education, training, and leadership development to health center staff and boards to promote excellence and cost-effectiveness, and it builds partnerships to stimulate public- and private-sector investment in the delivery of quality healthcare to medically underserved communities. The NACHC works closely with state and regional organizations, including primary-care associations and health center networks.

Quality and Costs of Care

CHCs help improve access to primary and preventive care to vulnerable populations who otherwise would not have access to services such as immunizations, health education, and screening tests. Ninety-nine percent of uninsured health center users have a usual source of care compared with

75% of all uninsured people nationally. Uninsured adults who use health centers are more likely to be counseled about diet and eating habits, physical activity, smoking, drinking, drug use (55% vs. 39%), and sexually transmitted diseases than are U.S. uninsured adults. Medicaid and uninsured patients who go to CHCs are more than 50% more likely to have up-to-date pap smears and mammograms than the overall U.S. Medicaid and uninsured population. Health centers have been shown by the Institute of Medicine (IOM) and the GAO to reduce racial and ethnic disparities in infant mortality, prenatal care, rates of tuberculosis, and death rates. Ninety-nine percent of health center patients surveyed reported that they were satisfied with the care they received at CHCs.

CHCs also serve as models for diagnosing and managing chronic conditions such as diabetes, asthma, depression, cardiovascular disease, cancer, and HIV. The Bureau of Primary Care runs the Health Disparities Collaboratives (HDC), which led to improved health outcomes and lowered costs of treating patients with chronic illness. More than two thirds of CHCs participate in these HDCs, which are a model of care that supports patients in their goal of self-management by a care management team. This team may include a health educator, nurse care manager, social worker, health-care provider, and specialists such as ophthalmologists and podiatrists. More than 75,000 CHC patients with chronic diseases have been enrolled in these HDC registries for cancer, diabetes, asthma, and cardiovascular disease. A study in South Carolina showed that diabetic CHC patients in the Diabetes Collaborative had annual health costs of \$343 per patient, while diabetic patients seeing other, non-CHC providers had annual costs of \$1,600 or \$1,900 with specialists. The CHC patients in the Diabetes Collaborative registry had dropped their hemoglobin A1c or average blood sugar from 11 to 8.

Health centers provide cost-effective care, with the average annual expenditure about \$250 less per patient than at an office-based medical provider. Health centers also reduce Medicaid expenditures due to reduced specialty care referrals and fewer hospital admissions. A study conducted in 1980 found that Medicaid patients who used community health centers had a 30% to 65% lower hospitalization rate and used 12% to 48%

less total Medicaid funds than a similar group of Medicaid patients who did not use CHCs. A more recent study showed that communities served by health centers had 5.8 fewer preventable hospitalizations per 100 people over 3 years than other medically underserved communities not served by a health center. Health centers serve about 10% of all Medicaid enrollees nationally, but in actual Medicaid dollars, this amounts to less than 1% of all Medicaid payments to all providers. A 2004 study showed that FQHCs improve access to primary care for the uninsured and underinsured, and reduce emergency room visits and hospital stays.

Future Implications

CHCs provide essential healthcare services to vulnerable populations and continue to improve health outcomes for the underserved. They have a strong presence in their neighborhoods, helping bolster local business and stimulate economic growth. As the number of uninsured Americans continues to grow and health reform becomes a topic of national policy, CHCs will continue to increase access for patients, improve quality of services, and maintain affordable care for low-income populations.

Sarah-Anne Henning Schumann

See also Access to Healthcare; Community Mental Health Centers (CMHCs); Federally Qualified Health Centers (FQHCs); Health Disparities; Medicaid; Primary Care; Uninsured Individuals; Vulnerable Populations

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- National Health Policy Forum (NHPF):
<http://www.nhpf.org>

COMMUNITY MENTAL HEALTH CENTERS (CMHCs)

Community mental health centers (CMHCs) offer a full array of community-based mental health services addressing problems such as depression, anxiety, and schizophrenia. They also provide support services such as stress management, support groups, and job training and placement. These centers incorporate a public health approach to prevention and the treatment of mental health problems. By doing so, they aim to reduce healthcare costs by lowering expensive inpatient hospital stays without reducing the availability and quality of services. The centers provide inpatient and outpatient services, including counseling therapy, medication management, daycare services, hospital referral, and case management of drug and alcohol problems. Physicians, psychologists, social workers, psychiatric nurses, and other mental health professionals usually work at CMHCs. And administration staff provide the organization and leadership needed to effectively coordinate the services. Together, they provide community-based services and resources that improve the general physical and social functioning of individuals, families, and communities.

History

CMHCs have been in existence in the United States since the early 1960s. President John F. Kennedy signed the Community Mental Health Services Act in 1963. With the passage of PL 88-164 (also known as the Mental Retardation Facilities and Community Mental Health Centers Construction Act of 1963), federal health policy shifted from providing mental healthcare at large state-run hospitals to community health centers across the nation. The National Institutes of Health (NIH) supports and conducts research on mental illness through its Institute of Mental Health (NIMH). At the time of the law's passage, NIMH was assigned the responsibility of offering states the opportunity to develop CMHCs instead of state psychiatric hospitals for persons with mental illness.

Most CMHCs continue to be financed by federal, state, and local government funding, while some are funded through private organizations. Currently, the Center for Mental Health Services, the Center for Substance Abuse Prevention, and the Center for Substance Abuse Treatment of the Substance Abuse and Mental Health Services Administration (SAMHSA) administer the Mental Health Services Block Grant Program and the Substance Abuse Prevention and Treatment Block Grant Program for CMHCs. These block grant programs fund CMHCs to create programs that prevent mental health and substance abuse problems as well as expand existing services for treating mental health problems. Payments from clients, private insurance, Medicare, and Medicaid, and fund-raising efforts contribute to the financing and maintenance of the centers.

Recent Trends

The *First Report of the Surgeon General on Mental Health* was published in 1999 through collaboration with SAMHSA and NIMH. This report addressed the effectiveness of mental health services and the range of services existing for mental illnesses in the nation. In 2002, President George W. Bush formed the President's New Freedom Commission on Mental Health and charged a panel of experts with conducting the first comprehensive study of the nation's public and private mental

health delivery system. Results from the study indicated that the nation's mental health system required a reexamination of health policy and systems. It was found that fragmented mental health services caused problems for both patients and providers because there was a lack of continuity of care. The study identified six national goals to transform the nation's mental health system: (1) increased education about the importance of mental health; (2) the development of consumer- and family-driven approaches to seeking services; (3) the elimination of disparities to accessing mental health services; (4) early mental health screening, assessment, and referral to services; (5) ongoing and innovative research; and (6) the development of technology to increase access to services, resources, and information. As a result of the study, community health centers are incorporating these national goals into their models of care.

The two overarching goals of Healthy People 2010 are to increase the quality and years of healthy life and eliminate health disparities. Mental health is 1 of the 28 focus areas and 1 of 10 leading health indicators. As a result, shifts in focus have occurred regarding CMHCs and services, including the increased attention to health disparities and minority populations. As a result of the President's New Freedom Commission on Mental Health, CMHCs have also been focusing more efforts on advocacy, outreach, and community mental health education. These changes have led to a concern among some mental health professionals regarding the allocation of services provided for persons with severe and persistent mental illness. Since the original purpose of the Community Mental Health Services Act of 1963 was to address the needs of persons with mental illness, a shift to the needs of the larger community may leave the most severely mentally ill persons without needed mental health services.

Future Implications

Community mental health centers often face the uncertainty of receiving ongoing financial support based on current levels of federal and state funding. Hence, an important need is to achieve and maintain organizational sustainability. Chances of success are increased when CMHCs collaborate

with surrounding institutions such as local community hospitals and universities and develop partnerships with their communities. Integration of CMHCs with community-based systems and networks allows increased commitment and follow-up with clients and families. It also facilitates the development of improved methods to measure and evaluate factors related to access, cost, quality, and the provision of mental health services.

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See also Access to Healthcare; Community Health Centers (CHCs); *Diagnostic and Statistical Manual of Mental Disorders (DSM)*; Disability; Disease; Mental Health; Mental Health Epidemiology; Substance Abuse and Mental Health Services Administration (SAMHSA)

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COMPARING HEALTH SYSTEMS

Comparison is elemental and learning inevitable in life as much as in health services research. We know what something is only by reference to what it is not, while the very process of referring and distinguishing depends on patterns of classification

and categorization inherited from others and inhabited by virtue of the language we use.

Much of the rationale of comparative analysis in public policy rests on the claims it makes about learning. Ordinarily, these are of two kinds, one cast in terms of evaluation and the other as explanation. Cross-national evaluation assumes that researchers might learn from others: If they look abroad, they might examine alternative ways of doing things, alternative solutions to common problems, and new ideas that might work for them. Single-pipe financing, for example, or the flow of funds from a single source, seems to limit the growth of the cost of healthcare (simply because those standing at the pipe can turn the tap on or off).

Meanwhile, in seeking explanations of why things happen as they do, comparing two or more cases makes it possible to isolate dependent and independent variables and then to specify relationships between them. This makes for greater (and sometimes lesser) confidence in the understanding of causes and effects, inputs, outputs, and outcomes. Historians of health policy, for example, note the role of organized labor in the introduction and expansion of public coverage for the personal costs of healthcare: In some European countries, national systems were introduced by conservative regimes to meet (or at least blunt) workers' demands; in others, they were introduced by workers' parties once in power.

In both instances, evaluation and explanation, comparison constitutes a more or less elaborate appeal to scientific method to establish what works, and why. It is encouraged by demands for evidence-based policy and plays well to an assumption that good policy should be based on good science.

Yet there is a third function of comparison, one that may in fact be prior to the other two. Because it seems more ordinary, more ubiquitous, it often passes unnoticed. This is comparison as a form of exploration, of self as much as others. Researchers figure out who they are and what they do by reference to others, by association with them, and in distinction from them. As the British medical sociologist Philip Strong described in *The Ceremonial Order of the Clinic*, it was only when he watched clinical encounters in the United States that he understood how those in the United Kingdom really worked.

The origins of the cross-national, comparative investigation of health systems lie at least as far back as the University of Chicago's medical sociologist Odin W. Anderson's work of the early 1960s. But they came into vogue in the 1980s and 1990s for a number of contextual reasons. Some of these have to do with the increased availability of low-cost air travel and information technology. But it has also become clear that systems of all kinds had to find some way of managing increasing demand in the context of fixed or at least finite resources. At the same time, relations between countries were becoming more competitive, meaning that getting it right in health policy—ensuring universal access to high-quality healthcare without breaking the bank—was to get ahead both in domestic politics and in the international economy. Global trends were creating unprecedented opportunities for comparison and learning, as well as a pressing need to take them.

Survey, Case Study, and Comparison

It was the Organization for Economic Co-operation and Development (OECD) that set the terms of international comparative debate in the late 1980s as those of efficiency and cost containment. It provided its essential currency, too, in a continuously updated and elaborated comparative data set, which now includes aspects of system performance. In turn, statistical data are complemented by increasingly systematic descriptive accounts of health systems, such as those provided by World Health Organization's (WHO's) reports on health systems in transition. Processes of professionalization (of health services management, for example) and regionalization (as in the expansion of the European Union) occasion conferences and meetings at which these data and what they mean are discussed. It is now effectively impossible for health policymakers in one country to think and act without some understanding of what their counterparts in other countries are thinking and doing.

More academic research in comparative public policy has identified different types of health systems and then sought to account both for those differences and for the effect they have on the way systems develop. The health systems of

OECD countries appear to fall into three distinct types: (1) the national health services of northern and southern Europe, largely tax-financed and with a salaried profession working in facilities that are publicly owned; (2) the compulsory social insurance systems of continental Europe, with facilities in mixed public and private ownership and in which physicians' income is in some way proportionate to the amount of work they do; and (3) systems based to a much greater extent on private insurance, such as the United States, in which hospital ownership is mixed (and a higher proportion than elsewhere may be for profit), physicians' income is typically from fees, and there is no assumption that population coverage should be universal. Much comparative policy research has been essentially trichotomous, based on sampling representative cases of each of these models.

WHO's *World Health Report 2000* sought to shift the terms of cross-national policy discussion by ranking the different national health systems of the world according to their performance on selected indicators. It was an exercise in benchmarking, which refers broadly to the comparative assessment of organizational performance, undertaken to inform its improvement (benchmarking emerged in fast-developing areas of industry and commerce, where no objective standards of evaluation exist, or where those standards change quickly; it works not by the imposition of standards but by the construction and subsequent discussion and interpretation of norms). The WHO report was met with substantial technical criticism, principally for the way it used composite indicators to measure performance and for its sensitivity to different definitions and measurements of efficiency. More radical criticism was made of its purpose and implications. Nevertheless, it made for more sophisticated discussion of the principles and methodology of cross-national comparison than had existed before.

The assumption behind the data collection and dissemination activity of international agencies such as the OECD and the WHO seems to be one of essential similarity. Standardized reporting mechanisms seem to construct a common frame of reference within which transnational assessments and initiatives can be exchanged. Case-based comparisons of policy and politics, in contrast, tend to

emphasize the local specificity of health service arrangements, including their determinants, functioning and effects, and a consequent need for caution in assessing (let alone applying) comparative “lessons.”

For comparison and learning from it are more difficult than they seem in several ways. First, cross-national comparative research is a laborious and protracted activity, demanding of the researchers that they mesh more than one local wisdom with formal and generic scientific understanding. Second, the size, intricacy, and complexity of health systems, as well as the scope and scale of change to which they are subject, mean that in practice, policy lessons have been as frustratingly difficult to draw as they are to apply. Third, and perhaps even more fundamentally, this conception of comparative research is predicated on a rationalist model of the policy process. It casts comparative analysis as a technocratic activity and its purpose, in the American political scientist Aaron Wildavsky’s phrase, as speaking truth unto power. It separates knowing from doing: Where it is the business of the comparativist to go abroad in the world, to garner new knowledge and bring it home, it is that of the policymaker to take account of it. It is for research to know and for government to act.

Comparison in Practice

Meanwhile, of course, policymakers themselves are out there in an internationalized policy world, constructing and devising truths and lessons of their own. But how do they do so? What kinds of comparison do policymakers make?

What policymakers know about what is going on abroad they know from published material in journals and reports; from attending conferences; through targeted visits to other countries, regions or specific projects, and through various forms of more sustained exchange. Published research forms the apex of what has come to be termed the *hierarchy of evidence*, and policymakers frequently commission reviews of such work. Its usefulness, however, is subject to familiar qualifications. The applicability of generic research findings to different, specific local contexts is questioned, while for many issues and problems little evidence about the effectiveness of particular interventions exists.

Meanwhile, of course, public officials talk to each other, at conferences and other meetings. Significantly, too, the conference is not just a means of exchanging information but also of making contacts and forming relationships, of networking. These are sometimes consolidated by fact-finding trips, by going and seeing what others do. Government officials and their civil servants, as well as political leaders and opinion formers, often make exploratory visits to other countries that interest them. For example, Lloyd-George (then the British Chancellor) famously undertook a formative visit to Germany in 1908, during which his initial interest in a contributory pension scheme developed into the broader conception of social insurance that underpinned the landmark Liberal Reforms. In 2002 and 2003, members of the United Kingdom’s Department of Health visited California’s Kaiser Permanente healthcare organization, interested in understanding the relationship between funding mechanisms and the quality and productivity in service delivery.

The motivation may come from the host as much as the guest, in that international experts frequently act as consultants to domestic programs and projects. In 1991, in New Zealand, reform proposals were developed by a Health Services Task Force, which appointed different groups of international consultants to consider specific issues. In Sweden in 1992–1993, the findings of a controversial parliamentary commission on healthcare, *HSU 2000*, were reviewed by an international group of health policy researchers and administrators.

Sometimes, the meeting or visit may develop into a more sustained or substantial exchange, including bilateral agreements to foster partnerships between offices and organizations.

What distinguishes these various kinds of learning? What connects them to each other? What policymakers know from published research is highly mediated by the process of data collection, analysis, and dissemination. The conference setting makes it possible for the reader or listener to interrogate the researcher and for readers and listeners to ask questions of each other. In turn, the visit makes it possible for information and understanding to be acquired directly by the visitor, for him or her to engage more immediately in “situated learning.” What this means is that a nominally scientific system of knowledge (the hierarchy of evidence) is

embedded in a social one. When asked about what they learn from abroad, policymakers respond in terms of “meetings,” “study visits,” “links,” “contacts,” and “networks.” What goes on in other countries is sometimes genuinely remote, read or heard about if known at all, but it is also sometimes personal, informal, and even intimate. Here, a disjuncture begins to emerge between the models that actors consciously espouse from those they effectively use (their theory-in-use). The difference is between the rational, clinical, or scientific epistemology in which public health policymakers and practitioners are trained and the social, managerial, and political ways of knowing that are the currency of their daily practice.

Understanding Comparison in Research and Practice

There are three ways of thinking about doing comparison in health services research, and they have corollary assumptions about the relationship between research and practice, about the ways in which comparison might be a source of learning.

The first is rationalist. The researcher’s commitment is science, assuming that the sensible policymaker will take up his or her findings and use them to make more effective decisions. Comparative evidence of the extent of health inequality has clearly informed recent public health initiatives in Scotland, for example.

The policy scientist, however, will argue that what is rational for the policymaker is what fits his or her purposes and interests. This is why evidence from abroad seems so often to be used instrumentally, as ammunition in domestic policy warfare. In the United States, for example, both Canada and the United Kingdom (very different healthcare systems) can be praised for their universalism, attacked for their “socialism,” or both. The strength of commitment to existing arrangements is also partly why research that reports uncomfortable news is so vigorously attacked on methodological grounds.

The second way of thinking about doing and learning from comparison is institutionalist. There are good reasons to think that comparative research is most meaningful when sampling cases that are similar in most important respects: This is why so

much of it has focused on the OECD and within that group on selected countries in Europe and North America. There are similar reasons to think that countries might have most to learn from those like them because they share institutional, financial, or administrative arrangements or a common language and political culture and on both counts are likely to face similar problems. Note that the United Kingdom’s National Health Service (NHS) leaders sought to learn not from the United States in general but from California’s Kaiser Permanente in particular.

The policy scientist, for his or her part, would note that change is always more likely to be incremental than radical and that what policymakers know and think is shaped by the immediate environment—as is the way they interpret news from abroad and as is the news itself. The bulk of health services research is generated in the United States and the United Kingdom and/or is written in English, and is necessarily inflected in particular ways. To take up the American political scientist Herbert Simon’s famous phrase, the “rationality” of cross-national research is as “bounded” as that of policy making.

And the third way of thinking that matters here is to take seriously the idea that both research and policy paradigms are social constructs. Cross-national analysis in health policy shares many of the characteristics of what the American historian of the history and philosophy of science Thomas Kuhn’s would call “normal science”: The field is still small enough for many of its key figures to have known and worked with each other and to share assumptions about what warrants investigation and how.

One of those standard assumptions is that cases or units of comparative analysis are independent of each other (while the suspicion that they might not be is what is known as Galton’s problem, named after Sir Francis Galton). Yet researchers know that professionals and patients move between systems, as do technologies, regulations, and sometimes money—and as, too, does health services research. Policymakers cannot help but have some comparative understanding of health systems, not least as a result of the work they do. But they know much less about how that matters, about how new knowledge is interpreted, adapted, and translated in specific local contexts. Major statements and reports from the

OECD, the WHO, and others, for example, seem to serve not as evidence but as opportunities for interpretation. To the extent that health systems are complex systems, researchers may need to begin to think of relationships between them less in terms of comparison and learning than of coevolution.

What all this might mean for the comparative mission of health services research is that research in itself will make little useful difference to policy. Its significance lies in disturbing the assumptions and routines of prevailing patterns of policy making; what difference it makes depends on the arguments, interpretations—and sometimes decisions—that result. For what policymakers know about what goes on abroad is often fragmented and difficult to process: The scientific and technical knowledge they value is embedded in specific social and political contexts, while the lessons they look for seem both essential and elusive.

As a result, policymakers learn with others as much as from others, and they do so in debating what different sets of ideas, evidence, and experience might mean. They operate much closer to the third, exploratory function of comparison set out above than sometimes imagined. By the same token, of course, conditions for such a dialogue are difficult to establish. It may well be these difficulties of constructing opportunities for and making commitments to open, sustained communication across countries that set limits on the extent to which learning by comparison occurs.

Richard Freeman

See also Anderson, Odin W.; Health Services Research in Canada; Health Services Research in the United Kingdom; International Health Systems; Pan American Health Organization (PAHO); Public Policy; United Kingdom's National Health Service (NHS); World Health Organization (WHO)

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COMPENSATION DIFFERENTIALS

Compensation differentials play an important role in understanding labor economics and trends in employee benefits. In equilibrium labor markets, where the supply and demand of labor intersect, people are paid what they are worth; more technically, individuals are compensated the value of their marginal product. Compensation, however, can take many forms, including money wages, vacation time, pleasant working conditions, a pension, and/or employer-sponsored health insurance. Thus, if compensation in the form of pension plan generosity is reduced, then some other element of the compensation bundle will be increased. There will be a compensating adjustment in the form of higher wages or perhaps increased job security.

Compensation differentials also help illustrate the complex nature of employer-sponsored health coverage. A growing body of empirical evidence supports the notion that workers pay a price for health coverage through their jobs, which may be reflected in lower wages or weaker pension packages.

Theory

In health services, the concept of compensation differentials is most commonly seen in discussions of employer-sponsored health insurance. The underlying concept is that if health insurance coverage is added to an employee's compensation bundle, then some other benefit will be reduced, such as money wages or pension. If this adjustment did not take place, the firm would find that it was paying more than the market clearing "price" for labor. People would be clamoring to work for the firm, and they would be willing to do so at a lower level of compensation. This argument is perfectly symmetrical. In an equilibrium labor market, if a firm decided to drop health insurance from its compensation bundle, it would have to increase some of the remaining elements in the bundle. Otherwise, current employees would resign to take jobs that offered better overall compensation.

Of course, the theory is based on equilibrium. If the demand for labor is rising, one would expect an employer to add something to the compensation bundle, be it a more generous health insurance package or more wages without removing other elements. Similarly, if the demand for labor is falling, the firm can reduce wages or cut health insurance benefits without adjusting the compensation bundle because workers are less likely to be able to find other employment.

The upshot of this theory is that workers pay for employer-sponsored health insurance in the form of lower wages and or reductions in other forms of compensation. This model has a number of implications. It implies, for example, that if a state were to require firms to provide health insurance for their workers, the workers would pay for this coverage in the form of lower wages or fewer other benefits. The theory suggests that there would be few unemployment effects unless wages could not be adjusted further downward, perhaps because of minimum wage laws. The

theory also implies that if an employer were to reduce the coverage in its health insurance plan, perhaps by raising the copays for physician visits and prescription drugs, the employer would have to improve coverage in some other dimension. Employers would have to make workers whole, by raising wages, increasing pension contributions, or expanding other forms of compensation. If this is not done by the employer, many of the employees would seek employment elsewhere. With this theory, the price of employer-sponsored health insurance to the worker is not just the out-of-pocket premium; it is the out-of-pocket premium plus the wages and other benefits given up.

Compensation differentials are one of the strongest predictions to arise from labor economics. A 2005 survey of health economists indicated that 91% of them agreed with the statement that "workers pay for employer-sponsored health insurance in the form of lower wages or reduced benefits."

Empirical Evidence

Until recently, the empirical evidence of compensation differentials in health insurance has been sparse. The difficulty has been controlling for worker productivity. For example, if a person has relatively few skills, education, or experience, he or she will not be very productive in the labor market. The worker may have a job with low wages and a modest health insurance plan. Someone with more skills, education, or experience may have both higher wages and a more generous health insurance plan. If one ignores productivity and simply compares the wages and health insurance of the two individuals, one would conclude that there is no compensation differential between wages and health insurance. Indeed, one may conclude that higher wages and generous health insurance are positively associated with one another.

Employers want to hire job candidates who are intelligent, are creative, understand the business, are able to work well with coworkers and the public, are able to take and carry out orders, are able to meet deadlines, and can provide leadership for the tasks at hand. These are the characteristics of productive workers. Finding such employees, however, is difficult. Suppose that the

only information employers had about applicants were their age, years of schooling, and perhaps the number of years of experience in the industry. When studying compensation differentials, researchers face similar challenges. Because only very crude measures of productivity are available, the resulting comparisons are biased toward positive relationships between wages and benefits. The empirical issues are compounded because a researcher would also want to control for the relevant household marginal tax rate because under current U.S. law, employer-sponsored health insurance is not considered taxable income, while money wages are taxed. This design provides incentives to shift compensation from taxed wages to untaxed health insurance benefits.

A study from 2004 provides the most straightforward analysis of compensation differentials, which examined data from 1988 through 1990 on a panel of workers, some of whom changed jobs. Researchers could have taken the standard approach to studying compensation differentials by estimating a regression equation in which wages were a function of having employer-sponsored health insurance, observable job, and worker characteristics. The problem, however, is the inability to adequately account for the unobserved differences in productivity across workers. Instead, this study estimated worker-specific changes in wages in an equation as a function of the change in the presence of employer-sponsored health insurance and changes in job and observable worker characteristics. If one can assume that worker productivity does not change much from year to year, then this change equation effectively holds productivity constant. Each person serves as his or her own control. The study found that workers who lost health insurance over the period had wage increases of 10% to 11%. This finding presents good evidence of compensating wage differentials.

In an earlier study, researchers examined the effects of the imposition of state insurance mandates for maternity benefits. In 1979, the federal government required that most group health insurance plans cover maternity care like any other covered medical condition. Before that time, only 23 states had done so. In this study, investigators undertook what is called a differences-in-differences-in-differences

(DDD) analysis. They compared the change in wages before and after the enactment date of the laws (Difference 1), in states that did and did not enact the law (Difference 2), for people who would and would not be affected by the law (Difference 3). The idea is that the wage changes in unaffected states and for similar but unaffected individuals would control for other factors at work in the states and local labor markets.

The states of New York, New Jersey, and Illinois enacted the maternity care mandate between July 1, 1976, and January 1, 1977. The states of Connecticut, Massachusetts, Ohio, Indiana, and North Carolina were used as controls because they did not enact such laws. The average wage for relevant workers in these states ranged from \$5.59 to \$6.61 in constant 1978 dollars. Affected workers were defined as married women of childbearing ages, that is, between the ages of 20 and 40. The unaffected group was defined as all individuals between 40 and 60 and all single men. The individuals excluded from the study were single women and married men aged 20 to 40. Both of these groups could have been affected by the laws, but their inclusion would only complicate the comparison.

Married women aged 20 to 40 in states that enacted the law had wage decreases of 3.4%. In states that did not enact the law, married women aged 20 to 40 had wage increases of 2.8%. The difference in these two differences was -6.2%. For the unaffected group, single men aged 20 to 40 and all people aged 40 to 60, in the states enacting the law, wages decreased by 1.1%, suggesting that there were other wage trends going on in the experimental states besides the enactment of maternity benefits laws. For the unaffected group in states that did not enact the laws, real wages declined by 0.3%. Thus, the difference-in-differences for the unaffected groups was a decline of 0.8%. The estimated effect of the laws was the difference in these two overall differences or 5.4%. This study uncovered dramatic evidence of compensating wage differentials that are borne by the affected group.

Another study from 1999 used the relationship between age and wage to identify compensating wage differentials. The investigator argued that older workers were more likely to have health insurance claims and so any compensating wage

differential for employer-sponsored health insurance should be more pronounced for older workers. Moreover, these claims should be higher in communities with higher healthcare costs. If compensating differentials exist, then older workers in communities with higher health insurance premiums should receive lower wages. This study found that wages were \$113 lower for each year of age in the high-premium markets relative to those facing lower premiums.

Last, another study used the 1989–1999 National Longitudinal Survey of Youth to examine the effects of obesity in the labor market. The researchers found that obese individuals with employer-sponsored health insurance received lower wages, while those without employer-sponsored coverage, those with nongroup coverage, and those with no health insurance coverage did not receive lower wages. The investigators' estimated wage reduction was roughly in line with the additional medical costs associated with obesity.

Michael A. Morrissey

See also Cost of Healthcare; Employee Health Benefits; Health Economics; Health Insurance; Health Insurance Coverage; Public Policy; Tax Subsidy of Employer-Sponsored Health Insurance

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- Employee Benefit Research Institute (EBRI):
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COMPETITION IN HEALTHCARE

Competition in healthcare refers to the interaction between healthcare providers and third-party payers. This interaction is designed to obtain the business of consumers in the form of the purchase of healthcare services or insurance. This interaction also represents the marketplace for the purchase and distribution of healthcare services.

From a normative perspective, an emphasis on competition reflects a preference for private-sector control and delivery of healthcare services. It also reflects a preference for minimum government intervention and regulation of healthcare markets. Decision making in a competitive environment is also considered to reflect rational choice based on the best available information.

In its ideal form, when healthcare markets operate properly, competition will determine the appropriate prices for medical services, the appropriate organizational forms for healthcare financing and delivery, and the appropriate range and availability for cost/quality/service trade-offs. However, there are also major tensions built into how competition operates in the healthcare system. The major tension is over whether to support competitive mechanisms within a market paradigm on the one hand and whether to preserve access and fairness through government intervention on the other hand.

Competition is thought of as determining who gets what, when, and how, and this process, in turn, influences the pace and character of policy change. However, the American healthcare system is not structured to maximize consumer choice or sovereignty. Providers and third-party payers are in a much more powerful position than consumers due to issues related to asymmetric information, economic dominance, and structural arrangements. The federal and state levels of government on the

one hand, and employers on the other, have taken on the role of an umpire whose responsibility it is to resolve tensions and provide mediated or negotiated solutions.

Competition in healthcare markets is one of the primary tools used in the United States as a strategy to contain costs, promote efficiency, and encourage innovation. Indeed, competition has been the preferred strategy for cost containment in the nation, much more so than other cost containment strategies that are prevalent in many European countries, such as the use of price setting, global budgets, and rationing of access to healthcare services. In fact, some have argued that rigorous government enforcement of antitrust regulations and the resulting protection of private innovation have allowed the healthcare industry in the nation to remain a predominantly private enterprise, as opposed to one that is government run, as in most other nations. Because of this, the United States provides many examples of how competition can work in the market for hospital care. Market-oriented health policy highlights the role of incentives in generating appropriate behavior on both the demand and the supply sides of the medical marketplace, among both consumers and providers.

The laws of competition in the United States affect the way healthcare is financed and delivered, as well as its quality and affordability, through their effects on the interaction of providers and patients within the organizational and structural framework of the healthcare industry. Competition law has traditionally focused on the process of market interactions, not necessarily on the individual actors in that process or on the outcomes—it does not concern itself with whether the outcomes that result from the operation of an efficient market accord with a particular definition of optimal social policy. However, given changing market dynamics and expectations of consumers, the framework of competition law is expanding to take into account trade-offs between price, quality, innovation, and access, which are all features of the healthcare system that consumers are demanding.

Despite this, there are a number of problems with competition in the private insurance model in the United States. The decade of the 1990s witnessed profound changes in the competitive environment of healthcare providers. A large number

of mergers and acquisitions among hospitals increased the concentration of the hospital sector, and a few large national hospital chains gained a significant market share during this time period. The hospital industry argued that these mergers offered efficiency gains that more than offset any potential anticompetitive effects they may have. Despite concerns among federal antitrust regulators, industry analysts, and the public, some empirical evidence did emerge that these efficiency gains were real. Studies of hospital competition in California and Washington suggested that increasing competition across hospitals did in fact lower costs. Evidence also shows that health maintenance organizations (HMOs) and preferred provider organizations (PPOs) nationally document significantly lower healthcare costs in regions with competitive hospitals.

Competition in the U.S. health insurance market has been primarily driven by the development of managed care since the early to mid-1990s. By 1996, 73% of those obtaining coverage through employment were in managed-care plans, compared with 27% 8 years earlier. HMOs were the most popular plan type, accounting for 31% of the market.

The benefit structure in managed-care plans included far less in the way of financial incentives for patients, which had been the norm in traditional insurance plans. This reflected a managed-care philosophy that consumers should not be called on to limit their use of services because of their ability to pay. Instead, professionals—either the patient's physician, with incentives other than fee-for-service, or clinical staff of the health plan—should take responsibility for limiting services that have a low value.

Competitive Approaches on the Consumer Side of Markets

As already indicated, competition in healthcare can be characterized as reflecting the interests and interactions among consumers, providers, and third-party payers. Consumers want to maximize their power and choice based on the best available information about their providers, about their treatment options, and about the healthcare delivery system. However, consumers operate in a context of asymmetric information. Physicians have much more

medical information and expertise than their patients, and patients rely on their provider to offer and prescribe the most effective treatment possible. Providers, in turn, as typified by the traditional physician–patient relationship, depend on the loyalty of their patients and adequate reimbursement levels provided by third-party payers. Traditionally, providers have been in a position where physicians propose and patients dispose. Under this model, patients dissatisfied with their providers may switch physicians, assuming a healthcare system in which a consumer has free choice of providers. Third-party payers, and particularly managed-care payers, play a critical role in this system because they establish rates of reimbursement and can often determine if a consumer is able to obtain the services that he or she prefers. The managed-care revolution has significantly altered these traditional relationships, particularly in the era when most Americans receive their health insurance coverage through an employer who selects the benefit plans that will be available to the consumer. Just what the consumer is able to choose in this context is unclear. This has, in turn, significantly affected the context in which competition takes place.

Consumerism and managed competition share the market paradigm that social resources, including medical care, should be allocated based on individual rather than collective decisions. Informed and price-conscious individual choices represent the values and preferences of the patient better than do the choices of even the most benevolent third party. The performance of the delivery system is enhanced by consumer and provider incentives that align the pursuit of individual self-interest with the social interest in promoting a high-quality, cost-effective system of care. Collective choice mechanisms such as regulatory agencies, professional associations, and corporate organizations find their utility in supporting, and their disutility in displacing, individual choices.

Competition and Regulation

While there have been major pushes to enhance the competitive environment in healthcare, governments at the federal and state levels have also maintained a watchdog role and intervened when there have been perceived market failures with

respect to cost, access, and fairness. The impact of the balancing between competitive approaches and government regulation has been most profound in the hospital sector in the United States. An increasingly competitive hospital market, as well as changing payment policies in both the private and public sectors, has forced hospitals to reenvision their role in the healthcare environment, and a number of structural, procedural, and financial changes have occurred.

Competition has a number of effects on hospitals, including the potential to improve quality and lower costs, but it can also undermine the hospitals' ability to engage in cross-subsidization of the cost of care between profitable and nonprofitable services or between wealthy and poor consumers. Medicare pays essentially the same price for a given health service regardless of where it is delivered. As a result, hospitals compete for the business of Medicare beneficiaries on the nonprice, system-based features that they offer. On the other hand, there are price-based and nonprice-based competitive opportunities for hospitals in the private patient/payer markets.

In the United States, hospitals operate in a regulatory environment that has developed over time at the federal and state levels. Laws and regulations have emerged to address many issues, including public financing, patient confidentiality, patient rights, risk management, medical malpractice suits, peer review activities, withdrawal of life support, advance healthcare directives, medical guardianships, institutional review boards, hospital staff privileges, contract and corporate law as applied to the healthcare industry, AIDS-testing issues, certificates of need, and others.

Hospitals are experiencing a number of price-related pressures as a result of rising costs, insurance industry trends, Medicare payment policy, and regulatory mandates. Some of the factors that affect hospital pricing and the recent rapid increases in costs include the public's demand for new and better technology, the aging of the population, shortages of hospital staff, including nurses, demands for new and broader forms of information and reporting, patient safety initiatives, rising liability insurance premiums, higher pharmaceutical costs, and increasing numbers of uninsured patients to whom they are required to provide care. Many of these factors represent new areas in

which hospitals can find competitive advantages if they perform well, but these pressures on hospitals are often augmented by the fact that they, unlike some of the newer competitors, are obligated to provide a certain amount of uncompensated care and other services under federal regulations.

Traditionally, hospitals were where people went to receive a wide range of medical services, including diagnostic, therapeutic, and rehabilitative care. They were the point of care for patients with healthcare needs that ranged from relatively minor, acute conditions to serious, life-threatening emergencies. Patients would be admitted to the hospital and would stay until they were well, which would be anywhere from a few days to weeks, up to several months. Under this model, hospitals were the recipients of the bulk of healthcare dollars. This diversification of services allowed them to cross-subsidize relatively nonlucrative services with revenues from the more lucrative services they provided. Since they were required to maintain a certain number of beds, operating rooms, and emergency departments, often with residual capacity in case of unforeseen circumstances, they depended on these cross-subsidies to maintain their financial bottom line.

Over the past two decades, however, a number of trends have emerged in the hospital sector that have altered the competitive environment in which they operate. Almost without exception, these trends have challenged the traditional role of hospitals and have forced them to compete in new ways. Outpatient surgery centers, single-specialty hospitals, rehabilitation hospitals, and outpatient diagnostic imaging centers have all cut into the revenue sources that were previously available only to general hospitals. General hospitals, in the meantime, continue to be required to maintain residual capacity in the less lucrative or more expensive areas such as emergency care, general surgery, and intensive care. This diversification in the healthcare market certainly increases competition among different types of providers, but it has also forced the hospital sector to evolve in important and profound ways.

While historically hospitals operated as independent organizations within local markets, more than two thirds of the nation's hospitals are now part of multihospital system or operate under a network of affiliated hospitals. This hospital

consolidation represents both a response to increasingly competitive hospital markets and an opportunity to compete more efficiently by reducing duplication and capitalizing on economies of scale and administrative expertise. These systems and networks range from comprehensively integrated organizations with shared licensing and ownership arrangements to loosely organized partnerships with shared governing bodies but independently operating facilities. The benefits of hospital consolidation may include a reduction of excess capacity, increased ability to assume financial risk, expansion of the hospital's delivery network, and service coordination.

There has been some concern that hospital systems have used consolidation as a tool to exert increased market power to distort the competitive environment and demand increased prices from payers. This argument stems from the observation that some hospital mergers have resulted in higher hospital prices without the concomitant increase in efficiency, such as the integration of clinical services or reduction of duplication.

Hospital payment mechanisms are complex and varied, with some hospitals billing the patient directly and others billing their insurance company. Some insurance companies require the patient to pay a copayment at the time of service and then pay the hospital directly for all costs beyond that, while other insurance plans require the patient to pay the full bill up front and reimburse the patient later for allowable expenses. Many Medicare plans require a copayment at the time of service but pay the hospital directly for the remainder of the patient's bill. The impact of Medicare payment systems on the hospital sector has been substantial and widespread since it introduced its prospective payment system (PPS) in 1983.

The nature of the hospitals with which private insurance companies contract can affect the insurance companies' ability to compete with one another. For example, marketability of insurance plans to employers and employees depends not only on the price of the coverage they offer but also on the number of hospitals where coverage is offered and on the quality, accessibility, and desirability of those hospitals. Being a "must-have" hospital may confer a significant competitive advantage to such a hospital in contract negotiations with private insurance companies.

The Centers for Medicare and Medicaid Services (CMS), the federal administrative agency of the Medicare program, clearly has a profound effect on the competitive environment in which hospitals operate, but this is primarily an indirect effect through its price-setting authority. It does not, for example, have the ability to use competitive bidding or selective contracting mechanisms to exert direct control of the providers, with which it negotiates. And there is virtually no way for Medicare to encourage nonprice competition between providers. This is what recent pay-for-performance initiatives would attempt to do by inserting quality and outcome measures into the payment policy, but such initiatives are in their infancy.

Legal Framework Affecting Competition

The major way in which the federal and state governments affects competition is through the implementation and enforcement of laws and regulations focusing on unfair competition, antitrust, and certificate of need.

Unfair Competition

Competition law has traditionally focused on the process of market interactions, not necessarily on the individual actors in that process or on the outcomes—it does not concern itself with whether the outcomes that result from the operation of an efficient market accord with a particular definition of the best social policy. However, given changing market dynamics and expectations of consumers, the framework of competition law is expanding to take into account trade-offs between price, quality, innovation, and access, which are all features of the healthcare system that consumers are demanding. Hence, under these laws, government is able to intervene to label a given practice by a provider or insurance company to be unfair and thus null and void.

Antitrust

The application of antitrust laws, regulations, and principles to healthcare services relies on the assumption that hospitals are businesses that provide medical care as a service. This is a distinct

shift from the emphasis on the independent, fee-for-service provider and has been a relatively recent occurrence. The U.S. Supreme Court first applied antitrust principles to healthcare providers in 1975, and hospitals and providers are now required to comply with federal antitrust legislation. Previous jurisprudence had held that the medical community was a “learned profession” and therefore exempt from antitrust regulation.

There are three main federal laws that govern the competitive environment of the nation’s healthcare industry: (1) the Sherman Act (1890), (2) the Clayton Act (1914), and (3) the Federal Trade Commission Act (1914).

The Sherman Act, also known as the Antitrust Act, is the predominant law in the United States that deals with issues of competition in financial and business markets. The Sherman Act is concerned with maintaining competition to ensure consumer welfare, and it generally prohibits unilateral and collective conduct that poses unacceptable dangers to competition. Generally, the act prohibits contracts, combinations, and monopolization or attempted monopolization in restraint of trade. Section 1 (codified as 15 U.S.C. §1) of the act prohibits “every contract, combination . . . or conspiracy in restraint of trade.” As such, *competition* can be defined as “a dynamic process featuring voluntary transactions between, and independent decisions by, mutually accountable buyers and sellers.” In the healthcare setting, potential anticompetitive actions that are particularly scrutinized under the Sherman Act are price fixing, market division, and group boycotts. Section 2 of the act (codified as 15 U.S.C. §2) deals with the development of monopolies, particularly when they arise or are maintained through wrongful or exclusionary means. The existence of a monopoly in the healthcare sector, such as the presence of only one hospital in a given geographic area, is not necessarily a violation of the act, but tactics by that hospital’s administration to restrict the entry of a second hospital in the region may very well violate Section 2 of the Sherman Act.

The Clayton Act (and the Robinson-Patman Act of 1936, which is a related piece of legislation) prohibits commodity price discrimination; exclusive dealing arrangements that substantially lessen competition; and mergers, acquisitions, or joint ventures that would substantially lessen competition or

create a monopoly. Section 7 of the Clayton Act (codified as 15 U.S.C. §18) prohibits mergers and acquisitions where the effect “may be substantially to lessen competition, or to tend to create monopoly.” In scrutinizing potential, or planned, arrangements that could lead to future Sherman Act violations, the Clayton Act provides an additional safeguard against the development of anticompetitive monopoly power. In the current U.S. healthcare environment, in which major national healthcare systems have been consolidating their market power, both the Clayton and Sherman Acts have been repeatedly invoked.

The Federal Trade Commission Act prohibits unfair methods of competition and deceptive acts or practices, including misrepresentations or false and misleading advertising. Section 5 of the act (codified as 15 U.S.C. §45) prohibits “unfair methods of competition” and “unfair or deceptive acts or practices in or affecting commerce.”

There is clearly an overlap between these three laws, as well as in the regulatory authority to pursue claims under the laws. The U.S. Department of Justice (USDOJ) and the Federal Trade Commission (FTC) are the primary enforcers of the laws, and state attorney generals as well as private parties can file lawsuits under competition laws.

There are some exceptions under the antitrust laws that permit certain types of hospital mergers, and not all such mergers are scrutinized as potentially anticompetitive. In fact, the FTC’s “Health Care Statement,” which outlines its antitrust enforcement policy, provides a safety zone for certain types of hospital consolidation and merger that protects them from challenges. This safety zone is designed to lessen the burden for merger activities when the merging hospitals are not major competitors before the merger. It specifically protects mergers between two general acute care hospitals where one of the hospitals has an average of fewer than 100 licensed beds and has an average daily inpatient census of fewer than 40 patients. In general, the commission and the USDOJ will also not challenge a potential merger if there are significant, demonstrable efficiencies to be gained by the merger. To be deemed procompetitive (or at least not anticompetitive) such efficiencies should be merger-specific; be verifiable; and not arise from anticompetitive reductions in output or service.

However, other types of mergers may come under greater scrutiny by the FTC or the USDOJ if they tend to create or enhance the merging hospitals’ market power in a given region. Under the 1992 Horizontal Merger Guidelines of the commission, whether the proposed merger could possibly have anticompetitive effects depends on the following: whether the merger, in light of market concentration and other factors that characterize the market, would be likely to have adverse competitive effects; whether entry would be timely, likely, and sufficient either to deter or to counteract the competitive effects of concern; whether there are efficiency gains from the merger that meet the commission’s criteria for examination; and whether, but for the merger, either party to the transaction would be likely to fail, causing its assets to exit the market. Under these guidelines, a market is defined as a product and a geographic area in which it is produced or sold, such that a hypothetical profit-maximizing firm that was the only present and future producer or seller of those products in that area would likely impose at least a small but significant and nontransitory increase in price.

The institutional status (for profit vs. not for profit) of hospitals can sometimes become an issue in antitrust analysis when mergers are proposed. Being a nonprofit hospital does not per se protect it from scrutiny under antitrust laws although some courts have been more sympathetic to nonprofits wishing to consolidate their operations with other nonprofits. Even in these cases, however, the underlying antitrust issue is whether such an institution would use its newly acquired market power in ways that would be harmful to consumers.

Medical antitrust law is complicated by the fact that federal and state governments are a major regulator and purchaser of healthcare services while antitrust laws are primarily designed to regulate the private economy. Traditional antitrust law is designed to shape the behavior of private businesses, but there is a melding of private and public actors in healthcare service funding, purchasing, and delivery. This may lead to market-distorting effects that invite unnecessary business transactions, impair organizational efficiency, and hamper the negotiation of mutually advantageous arrangement by willing buyers and sellers. Government programs such as Medicare and Medicaid have a

substantial impact on how hospitals can conduct themselves within the marketplace as competitive businesses.

Additionally, antitrust law rests on the premise of active bargaining between buyer and seller to create competition. The rise of managed care and third-party payers has all but removed the active bargaining component. Managed care has changed the bargaining market in two distinct ways: mainstreaming explicit contracting for the sale of hospital services, and creating a new group of purchasing agents (third-party payers) who negotiate prices for health services. The complex and changing healthcare market, therefore, does not always fit cleanly into the traditional antitrust regulation framework, and some commentators have argued that these regulations may actually stifle competition and drive up costs as opposed to stimulate competition and moderate costs.

Certificate of Need

Certificate of need (CON) laws are state regulations that require institutional healthcare providers to seek prior approval before adding new improvements, equipment, or facilities or replacing existing healthcare facilities. Prior approval is granted by the respective state's Department of Health and is also required for the addition of certain medical services at the facility. CON laws are designed to hold down costs by preventing duplication of medical services. Examples of facilities required to seek CON approval include new hospitals, psychiatric facilities, chemical-dependency treatment facilities, and nursing home facilities. CON requests will be approved if it is determined that the community genuinely needs the proposed service or facility.

The CON laws were developed in response to the belief that there was wasteful duplication of medical resources and facilities within the hospital sector. The feeling was that because hospital prices were relatively fixed in a geographic area, hospitals did not compete for patients based on the price of their services but rather increased their competitive edge on the basis of perceived quality of care, services, or facilities. As a result, competition was based on quality and unnecessary, wasteful expenditures to attract patients.

CON laws were initially required by federal mandate in 1974, but this mandate was later

repealed in 1982, when it was found that such regulations had little impact on the rising cost of healthcare. In fact, critics of CON argue that they have been used by hospitals to stifle competition and that the programs may actually increase healthcare costs as supply is simply depressed below competitive levels. Despite these criticisms and the repeal of the federal mandate, 36 states and the District of Columbia have retained their CON laws.

Future Implications

The competitive environment in the nation's healthcare industry will develop in response to cost pressures and consumer demand, as well as technological advances. Among the greatest pressures for competitive reforms are consumer-driven care, a demand for greater choice of providers, the changing role of the hospital sectors, and the increasing importance of Medicare and Medicaid in the private health insurance industry. In addition, the trend toward self-insurance will also have an impact on the competitive environment. Financial incentives for patients will continue to become more important, and refinements to the benefit structures that include substantial patient cost sharing will get more attention. More emphasis will be given to incentives to choose more efficient providers.

Concerns over the rising costs of healthcare and health insurance have led providers, consumers, and third-party payers to new attitudes toward healthcare reform. The concern is over a growing number of employers who cannot afford to offer health insurance as a benefit, and a growing problem of lack of access to adequate healthcare.

The current discussion about healthcare reform is influenced by the Jackson Hole Group, which in the early 1990s asserted that the nation needed to adopt a strategy of managed competition. The concept of managed competition can be characterized as a market-based policy of controlled or regulated competition among insurance carriers with incentives for insurance carriers, physicians, and other healthcare providers to improve quality, increase benefits, expand access, and control costs. It calls for "robust competition among healthcare plans" by creating large regional healthcare cooperatives or health alliances.

In the future, competitive models will likely be built around consumers' choices and some of the core concepts of managed competition. Increasing amounts of information will be available to consumers, which will allow them to compare providers and financial arrangements as they make more careful healthcare choices. Information technology (IT) will be an important part of this new competitive environment in healthcare, and consumers and providers will clearly use IT in different ways. Providers will use IT to organize and present information about their efforts to increase efficiency and improve quality and to advertise to consumers. Consumers, on the other hand, will use IT to shop for the best deal from the best provider they can find. This will force providers to improve quality and outcomes in an effort to compete for consumers' business. Of course, this will require that more and better information become available about the various providers in the marketplace.

Hospitals are likely to continue to consolidate, motivated in large part by their dwindling market share as competition increases. This will create new opportunities for hospitals to develop innovative partnerships, perhaps integrating previously for-profit hospitals with nonprofit hospitals to develop new types of multihospital systems.

Competition will certainly play an important role in the U.S. healthcare system in the future, but just what form it will take and with what restraints remain to be seen. Indeed, who will have the greatest control in shaping the future of competition in healthcare in the nation—government, providers, insurers, or citizens—remains an open question.

Robert F. Rich and Christopher T. Erb

See also Certificate of Need (CON); Health Economics; Health Insurance; Hospitals; Managed Care; Rationing Healthcare; Regulation

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COMPLEMENTARY AND ALTERNATIVE MEDICINE

Constituted of multiple therapies that have their origin in cultural practices and traditional medicine, some of which have a history of thousands of years, complementary and alternative medicine (CAM) encompasses a diverse group of health-related practices and products that are viewed as existing outside mainstream medicine. The approach to healing and the wellness construct that defines each of these modalities may, in some respects, differ from the realm of conventional thought as present in the West or as is taught in the traditional medical curriculum in the United States. These CAM practices are divided into four domains by the National Institutes of Health's National Center for Complementary and Alternative Medicine (NCCAM): (1) mind-body medicine, (2) biologically based practices, (3) manipulative and body-based practices, and (4) energy medicine. The effectiveness and/or safety of some of

the modalities within these groups continue to be in question, while others are gathering strong scientific evidence in their favor.

Every year, an increasing number of Americans are using CAM therapies by means of licensed practitioners as well as through the use of over-the-counter herbal preparations. In 1997, David Eisenberg estimated that 42% of the U.S. population was using some form of alternative therapy, and another study by Nancy Elder estimated that at least 50% of primary-care patients were using some form of CAM. In 2004, the NCCAM illustrated that these numbers are rising with evidence that upward of 60% of adults in the United States are using some form of CAM. According to this survey, women more than men, people with higher educational levels, and people who have recently been hospitalized are more likely than others to use CAM. In addition, allopathic physicians are, in greater numbers, using these methods through referral or direct recommendations. Medical schools are incorporating this topic into the core curriculum, and continuing medical education courses are being offered in related topics. Also, some third-party payers are increasingly reimbursing for these services. As popularity continues to rise, expenditures dedicated toward this arena climb. CAM continues to grow in popularity within the United States and, in the process, enhances the lives of many while raising concerns of safety and regulation among others.

Whole Medical Systems

The NCCAM classifies certain fields of CAM under the heading of Whole Medical Systems as they are considered complete systems of theory and practice. There is some overlap with these medical systems and the four domains of CAM; however, historically these systems have developed independently and hold their basis within an accepted theory and often use specific modalities of practice as recognized within this framework. Traditional Chinese medicine is one of the most well-established and complete systems that have been practiced well before the first known written texts dating to 200 BCE. The maintenance of the body and spirit within a balanced state through the regulation of two opposing forces, yin and

yang, allows the proper flow of Qi, the vital energy, along meridians, pathways within the body. Traditional Chinese medicine uses acupuncture and moxibustion, the Chinese *Materia Medica* (herbal reference), and massage and manipulation as parts of its therapeutical modalities. Ayurvedic medicine, with origins in India, also places an emphasis on balance. This system attempts to restore harmony within the body, mind, and spirit through Ayurvedic treatments such as meditation, herbal therapy, massage, controlled breathing, and diet. Naturopathy, practiced mainly in the West, originated in Europe and holds six principles as its basis: (1) the healing power of nature, (2) identification and treatment of the cause of disease, (3) first—do no harm, (4) the physician as teacher, (5) treatment of the whole person, and (6) prevention. Naturopathy uses many forms of modalities, including diet modification, nutritional supplements, herbal products, hydrotherapy, massage, manipulation, and lifestyle counseling and borrows some therapies from traditional Chinese medicine, including acupuncture. Another recognized medical system is homeopathy, which uses the Law of Similars, stating that a substance causing a particular single or set of symptoms in a healthy person is viewed as a remedy in persons suffering from similar symptom(s), which can be cured in these individuals. The Law of Dilutions states that the more a remedy is diluted, the stronger it becomes. This field was formed primarily by a German physician, Samuel Hahnemann, in the 1800s and has increased in popularity since that time.

Mind–Body Medicine

The NCCAM domain of mind–body medicine is evolving, with more and more modalities being recognized as mainstream in recent years. Of note, patient support groups and cognitive-behavioral therapy are commonly used methods of counseling. Other modalities within this domain include meditation, prayer, mental healing, and creative therapy, encompassing art, music, and dance. In fact, prayer is the most common CAM practice used, with about 45% of the U.S. population practicing prayer for health-related reasons in 2002.

The importance of the mind within healing was recognized by traditional Chinese and Ayurvedic medicine, just as mind–body medicine recognizes the importance of the relationship between emotions and physical health. This, in part, is due to the interrelationship between the sympathetic and parasympathetic nervous systems and has been widely documented and often exhibited in patients through symptoms such as gastrointestinal hyperactivity, neck and shoulder pain, and headaches. These clinical manifestations have a direct relationship with increased levels of tension and stress in these individuals. Walter Cannon, in the 1920s, first drew the correlation between stress and the neuroendocrine response. Since that time, this field has continued to be extensively researched, and the importance of moral and spiritual aspects, belief, emotion, and positive thought within healing is more and more recognized. Intervention strategies used within this field include relaxation, hypnosis, visual imagery, meditation, yoga, biofeedback, tai chi, qi gong, and spirituality.

Biologically Based Practices

The biologically based practices as recognized by NCCAM include therapies such as botanicals, animal-derived extracts, vitamins, minerals, fatty acids, amino acids, proteins, and probiotics. With NCCAM estimating that about one fifth of the U.S. population use natural products, this domain encompasses a large portion of the popular usage of CAM. Herbal products are popular as they carry a perception by the general population of being more natural than pharmaceuticals as well as more gentle, having fewer side effects and being more affordable. Some of the most common herbs used in the United States include *Ginkgo biloba*, commonly used as an antioxidant and for the improvement of memory; St. John's wort, used for mild depression; ginseng, used for fatigue and weakness; garlic, used for high cholesterol; and *Echinacea*, used for the relief of common colds and respiratory infections. Some common supplements include glucosamine and chondroitin sulfate for osteoarthritis, CoQ-10 as an antioxidant to fight heart disease, melatonin for insomnia, amino acids for body building, and omega fatty acids for high blood pressure and high cholesterol.

The NCCAM survey concluded that only about 12% of those using CAM have done so through seeking care from a licensed CAM practitioner: Thus, the remaining use CAM to treat themselves. This can be alarming, as in contrast to the common perception of these products being completely safe, there are critical dosing issues with all, as well as possible dangerous herb to drug, food, or illness interactions. The Dietary Supplement Health and Education Act of 1994 exempted herbal medications and supplements from safety and efficacy requirements and regulations applied to prescription and over-the-counter medications. Because of this legislation, there can often be a problem with quality in these over-the-counter preparations. Variations in potency and biological, chemical, or pharmaceutical contamination may be present. Presently, the burden does not rest with the manufacturer. It is the responsibility of the U.S. Food and Drug Administration (FDA) to prove that a product is unsafe before it can be pulled from shelves. Therefore, practitioners and patients must strive to be well informed.

Practitioners and patients must also remain astute to avoid possible dangerous interactions. Herbs such as *Ginkgo biloba* may alter glucose levels and can be a dangerous product in persons who are diabetic. Other herbs and supplements such as ginger, garlic, and fish oils can inhibit platelet aggregation and dangerously alter the effectiveness of pharmaceutical anticoagulants commonly used in patients with arrhythmias and with a history of blood clots. There are multiple other possible dangerous interactions, and persons using these products should heed caution. Many products have been shown to be effective, but one should only use them after much study and consideration, as well as through recommendation by a medical practitioner.

Manipulative and Body-Based Practices

The manipulative and body-based practices domain includes chiropractics, osteopathy, and massage.

Chiropractics finds its origins as a profession in Davenport, Iowa, as developed in 1895 by D. D. Palmer, though historically, spinal manipulation has been a part of cultural practices for centuries throughout the world, including in ancient

Egypt. The basis of chiropractics according to modern theory is based on vitalism and proffers the tenant that normal functioning will return through joint structure restoration. Chiropractors work mostly with musculoskeletal complaints, including spinal subluxations, low back pain, neck pain, muscle strain, and tendonitis, but they may also incorporate therapy for other disorders such as asthma, upper respiratory conditions, constipation, and menstrual disorders. Through mechanical manipulation, the chiropractor is able to inhibit and reduce the pain reflex, release connective tissue, and stimulate the autonomic nervous system. Chiropractics is popular in the United States, as a discipline being the third largest health profession after medicine and dentistry, and in addition, many third-party payers will cover chiropractic services. Chiropractics is regulated in all 50 states, with 16 chiropractic colleges being accredited.

Osteopathy, developed in Kirksville, Missouri, by Andrew Taylor Still in 1874, is now considered a part of mainstream medicine. Practitioners in this field follow a curriculum similar to that of allopathic physicians, with more emphasis placed on a holistic approach with additional training in manipulation. Doctors of osteopathy continue with a residency appointment to become licensed practitioners in the field of their choice. Those who choose to remain within the realm of primary care are able to better use their additional training of a holistic approach to diagnosis and therapy.

Massage therapy is a very diverse field and holds its origins in cultural traditions throughout the world. Chinese medical texts dating back 4,000 years make reference to the benefits of therapeutic massage; the healing art of Ayurveda, originating in India, includes massage as part of its practice; and Hippocrates, as well, advocated the use of medicinal oils for massage therapy. Today, the field encompasses many categories, including relaxation or Swedish massage, neuromuscular massage, and craniosacral therapy, to name a few, and holds the intent of improving health through positively affecting relaxation, circulation, nerve responses, or energy flow through skilled manipulation of soft tissues and connective tissues. Some estimates state that more than \$4 billion is annually spent on massage by over 80 billion consumers. More than 200,000 massage therapists are licensed in the United States and practice independently as

well as within hospitals, fitness centers, primary-care offices, and intensive-care units and in conjunction with psychotherapy treatment programs and hospice.

The most common form of massage, Swedish massage, incorporates a variety of strokes, including effleurage, petrissage, tapotement, vibration, friction, and compression to aid in therapy through the relief of muscular tension. While Swedish massage generally focuses broadly on the full body, neuromuscular therapy often addresses localized areas of trigger points within the myofascial system and seeks to restore a balance with the alleviation of local and referred pain. Western massage techniques may, as well, be used for specific purposes such as sports, pregnancy, and with infants. Another classification of massage includes structural and functional movement and influences the posture and biomechanics of the body while reestablishing a balanced relationship with gravity. Forms within this classification include rolfing, Feldenkrais, zero balancing, craniosacral therapy, and the Trager Approach. Asian forms are generally referred to as acupressure and attempts to regulate Qi without the use of needles (as is used within acupuncture). The common forms within this classification include Shiatsu, Jin Shin Do, Jin Shin Jytsu, and Chinese Tuina.

Energy Medicine

The massage techniques of energetic or zone therapies are sometimes referred to as reflexology and fall within the NCCAM-defined domain of energy medicine, which includes biofield therapies such as qi gong, reiki, and therapeutic touch. Modalities not based on massage also fall within this domain and include bioelectromagnetic-based therapies such as pulsed fields, magnetic fields, and alternating-current and direct-current fields.

Acupuncture and homeopathy (described above as a whole medical system) are, as well, classified within the domain of energy medicine. Acupuncture, an art of traditional Chinese medicine dating back at least 2,500 years, uses Qi, a vital energy, that circulates in the body through pathways. Fine needles are placed at points along these pathways, also called meridians, to restore and balance the flow of energy in order to promote healing.

Licensing

Professional regulation of the CAM professions differs from state to state, with the most common CAM professionals being licensed acupuncturists (LiAcs), doctors of chiropractic (DCs), naturopathic doctors (NDs), and licensed massage therapists (LMTs). The professionals recognized by state professional license in a smaller number of states are as follows: homeopathic practitioners, therapeutic touch practitioners, reiki healers, herbalists, and aromatherapists. As concerns mainstream physicians, ideally all should have a competent working knowledge of CAM regardless of the extent to which they implement CAM into their practice. An adequate patient history should reveal utilization of CAM, thus giving warning if a certain CAM therapy possesses a contraindication or critical interaction with a proposed manner of treatment. Several estimates place the rates of patient disclosure to the primary-care physician concerning use of alternative therapies between 35% and 40%. These low rates can lead to complications and endanger patient safety. It is critical, thus, that medical curricula and continuing medical education include CAM as an important aspect of teaching.

Evidence

There is convincing scientific evidence supporting the efficacy of many of the previously mentioned therapies.

Mind-body interventions are effective for acute and chronic pain management, headaches, wound healing, and low-back pain. It has also been shown to be useful in coping with chemotherapy-induced nausea and vomiting as well as in reducing discomfort, controlling adverse effects, and improving hemodynamic stability as associated with some surgical procedures. Susceptibility to infection decreases with greater control of stress through relaxation techniques, and mind-body techniques have even been shown to assist in control of coronary artery disease. Acupuncture, for example, has been shown to be effective for the treatment of postoperative and chemotherapy-induced nausea and vomiting, nausea associated with pregnancy, postoperative dental pain, and osteoarthritis of the knee.

As concerns herbal preparations, there is some evidence that *Ginkgo biloba* in recommended doses can improve cognitive and social function in patients with dementia. Garlic has been shown to significantly lower cholesterol and lower blood pressure as shown in multiple studies. Saw palmetto is likely effective at reducing the symptoms of benign prostatic hypertrophy. Black cohosh, in addition, significantly reduces symptoms of menopause in perimenopausal women when taken over several weeks. The supplements glucosamine and chondroitin sulfate have been shown to be effective for improving joint symptoms caused by osteoarthritis. Omega-3 fatty acid, found in fish oil preparations, has been shown to be cardioprotective and will improve blood pressure control in patients taking the recommended dosages. Also, probiotics have been shown to reduce the duration of certain types of diarrhea in infants and children.

Massage therapy continues to be limited in its scope of available evidence though strong support does exist through some scientific studies. Massage has been shown to positively affect acute and chronic pain, chronic inflammation, lymphedema, anxiety, and arthritis. There is, as well, some support in consideration of the effect of massage on depression, diabetes, fibromyalgia, chronic headaches, stress, and hypertension.

The aforementioned evidence in support of specific CAM therapies should be viewed as a general overview and should not be considered to be all-inclusive. All scientific evidence should be scrutinized, with risks and benefits of the particular therapy weighed on a case-by-case basis in conjunction with discussions with a medical practitioner.

Future Implications

CAM is an extremely broad and rich field that is gaining in popularity in the United States in recent decades. Many of these health-related practices and products were developed over the course of thousands of years and often incorporate a construct of viewing disease and health that is viewed as being outside mainstream thought. An increasing number of research studies are being performed in recent years, and results are providing encouraging support for some therapies. While scientific evidence does grow in support of some

therapies and practices, patients and practitioners should continue to strive to be well informed of the interactions, contraindications, and side effects of the modalities they choose for treatment. Certain professions within this field are regulated at the state level, but many products are available over the counter, with little regulation. If used appropriately and judiciously, the practices and products within the realm of CAM can offer much in relation to health and wellness.

J. Andrew Dykens

See also American Osteopathic Association (AOA); Chiropractors; National Institutes of Health (NIH); Pharmacy; Physicians; Physicians, Osteopathic; U.S. Food and Drug Administration (FDA)

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Web Sites

- Alternative Medicine Homepage:
<http://www.pitt.edu/~cbw/altm.html>
- Complementary-Alternative Medical Association (CAMA): <http://www.camaweb.org>
- National Institutes of Health (NIH), National Center for Complementary and Alternative Medicine (NCCAM): <http://nccam.nih.gov>

Rosenthal Center for Complementary and Alternative Medicine: <http://www.rosenthal.hs.columbia.edu>
U.S. Food and Drug Administration (FDA):
<http://www.fda.gov>

COMPUTERS

Computers play an important role in increasing access, lowering costs, and improving the quality of healthcare. Healthcare organizations use computers for a variety of purposes in a variety of settings. For example, computers can be used to store and retrieve electronic medical records, to assist in medical decision making, and to improve patient safety by reducing medical errors. While many healthcare organizations use computers for various purposes, relative to other large industries (e.g., financial, travel), the nation's healthcare industry lags far behind in their use and applications. For example, although some large hospitals have electronic medical records systems, very few physician offices and nursing homes have such systems. Furthermore, most hospital electronic medical record systems are not compatible, and these records cannot be transferred from one hospital to another. The Agency for Healthcare Research and Quality (AHRQ) and several private organizations are attempting to change this situation by providing grant funds for healthcare organizations to purchase and implement various computer systems.

Basic Definitions

A computer is an electronic machine that manipulates data in accordance with a set of predetermined instructions. Earlier versions of computers used vacuum tubes and required a large building to house the computer. Now, computers come in many different forms and sizes from a large mainframe to a small smart phone.

A computer contains a system board, central processing unit (CPU), memory chip, system clock, power supply, expansion slots, ports, and bus lines. A system board is a flat board that contains the CPU and a memory chip. The CPU is the center of all processing. All data manipulation and

arithmetic/logic computations are performed and controlled in the CPU. A chip has many tiny circuit boards etched on small silicon wafers. The memory chip consists of registers that are located in the control unit and arithmetic logic unit of the CPU. Memory also consists of cache memory, random access memory (RAM), and read-only memory (ROM). Cache memory is located between the RAM and the CPU for faster access. RAM is used to store temporary data or programs when the computer's power is on. ROM stores essential information permanently, and the system clock controls how often the operations will take place within the computer. The expansion slots determine the functions that can be added to the computer. Ports are where printers, keyboards, and other devices connect to an expansion board in the unit. The bus lines are an electrical pathway through which bits are transmitted between the CPU and other devices. Bits are binary information consisting of zeroes and ones.

The set of instructions that control how the computer reacts is called system software. The operating system is the official name for the system software, and it allows the computer to interact with the application software. Application software is the computer software that enables the user to perform word processing, accounting, and other specialized functions.

The size and type of computer used depend on the type of information the user needs to conduct business. Computers are machines that are used to process data into information. Data are raw facts collected during the normal daily operational functions of an organization. In contrast, information is data that have been processed to gain the intrinsic value useful to the operation and management of the organization. Computers provide the processing power to transform the raw data into information based on a set of instructions. The set of instructions differ, depending on the classification of the computer system and the intended user.

Types of Computer Information Systems

There are five general types of computer information systems: (1) executive information systems, (2) transaction processing systems, (3) decision support systems, (4) management information

systems, and (5) knowledge work systems. Only the latter three systems are used in the health-care field.

Decision support systems can be managerial or clinical in nature and use various analytical tools to facilitate and improve the outcomes. The decision support systems can provide basic report generation or sophisticated graphical or textual integration from different data storages. In expert systems, the system integrates data and knowledge based on the structure and complexity of the problem presented by the user to suggest a feasible decision and/or alternatives. Management, physicians, nurses, pharmacists, and researchers use decision support systems.

Management information systems process raw data to provide useful, complete, and timely managerial information. The information is used by managers to organize daily tasks to support organizational plans and operations. These systems provide support to the information technology department, financial operations, personnel department, and other auxiliary departments.

Knowledge work systems are systems developed for professional and technical workers. These systems are more pronounced in healthcare now and are being used by nurses and physicians in the form of handheld computers.

Use of Laptop and Handheld Computers

The national nursing shortage and the complexity of healthcare knowledge have led to a redesigning of existing automation used in the point-of-care processes that occur between nurses and patients. Handheld computers have been employed to allow nurses to capture interventions or graphically view changes in data values at the patient's bedside. System interfaces have been developed to provide nurses with decision support information on a personal digital assistant (PDA) within the confines of the patient's room or home in an effort to increase patient safety and care management. PDAs can be synchronized with the main hospital information system and other team members' PDAs and can be used to browse the Internet for the latest medical information. Thus, nurses can stay current on all new findings contained in the medical journals through the daily use of a PDA.

Physicians also use PDAs, and they can soon be expected to have access to electronic medical records on them. Currently, physicians use PDAs and laptop computers to document patient findings and to order medical tests. Information can be synchronized to the main hospital information system where wireless connections are not available for online ordering or entry into the main databases. When laptop computers are used, the hospital provides connections at the nurse's stations or along the hallway for mobile connection so that data can be updated to the main computer system. Mobile computers and handheld devices allow physicians to tailor their workflow to meet the patient workload. Thus, they can see more patients without compromising safety or care.

Case managers and pharmacists also use handheld computers. As more knowledge work system applications are developed for healthcare, the use of handheld computers will likely expand, thus allowing healthcare professionals to provide closer and more personal support to patients without having to turn their back to the patient to enter data. However, with every advantage, a disadvantage also exists. The disadvantages that arise with the increased use of laptops and handheld computers are the increase in data security and data privacy risks. The risks that will arise from the increased dependency on these computers as a means to enhance medical care are that the devices are more susceptible to be misplaced or stolen, and thus, data encryption and password policies will need to be enforced more stringently. Therefore, the data contained on these devices will need to be protected to a given degree of certainty or at an acceptable level of risk.

Greer W. P. Stevenson

See also Clinical Decision Support; Cost of Healthcare; Data Privacy; Data Security; Healthcare Informatics Research; Health Informatics; Medical Errors; Quality of Healthcare

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Agency for Healthcare Research and Quality (AHRQ): <http://www.ahrq.gov>

American Medical Informatics Association (AMIA): <http://www.amia.org>

Leapfrog Group: <http://www.leapfroggroup.org>

CONGRESSIONAL BUDGET OFFICE (CBO)

Established by the Congressional Budget and Impoundment Control Act of 1974 (PL 93–344), the Congressional Budget Office (CBO) is a non-partisan federal agency within the legislative branch of the U.S. government. The primary responsibility of the CBO is to make budgetary and cost projections of legislation proposed by the U.S. Congress. It is analogous to the White House Office of Management and Budget (OMB), which makes estimates of projected spending for the executive branch of government. However, the political appointment of many OMB officials by the president tends to result in more partisan spending projections that tend to favor the president's policy agenda. Thus, the CBO's estimates are typically considered more credible and objective than those produced by the OMB.

Leadership

The director of the CBO is jointly appointed to a 4-year term by the speaker of the House of Representatives and the president pro tempore of the Senate on recommendations of both the House and Senate budget committees. There are no term

limits, but the U.S. Congress may pass a resolution to remove the director. The director hires all other CBO staff members, and positions are filled based on professional merit, rather than political appointment.

The current director of the CBO, Peter R. Orszag, took office in January 2007. He is the seventh director of the CBO. Prior to joining the CBO, Orszag, who is an economist by training, served on President Clinton's Council of Economic Advisors and was a senior fellow and the deputy director of economic studies at the Brookings Institution. Orszag's immediate predecessor was acting director Donald B. Marron, who served in that capacity beginning in December 2005. Alice Rivlin, the first director of the CBO, holds the title of the longest tenure as head of the agency, having served from the office's inception from February 1975 until August 1983.

Organization and Structure

The majority of the CBO's annual budget, which amounted to more than \$35 million in 2007, provides salaries for its more than 230 employees, the majority of whom have graduate degrees in fields such as economics and public policy. A mix of economists, policy analysts, budget analysts, and research assistants work in one of six of the office's divisions: (1) the Budget Analysis Division, (2) Health and Human Resources Division, (3) Macroeconomic Analysis Division, (4) Microeconomic Studies Division, (5) National Security Division, and (6) Tax Analysis Division.

The CBO also confers with the Panel of Economic Advisors and the Panel of Health Advisors. These two groups of experts are responsible for reviewing the CBO's methods and forecasts in the context of the current economic and sociopolitical landscape. The panels also advise the CBO on important developments in their respective fields.

The Budget Analysis Division, the largest division within the CBO, prepares spending projections of proposed legislation currently before the U.S. Congress and the CBO's estimate of the president's annual budget. The division is subdivided into four substantive units, each with expertise in a different area: (1) health; (2) defense, international affairs, and veterans' affairs; (3) human resources; and (4) natural and physical resources.

Cost Estimates

The CBO develops projections and prepares cost estimates of proposed legislation at the request of the U.S. Congress. Nearly every bill that makes it to a congressional committee will be scored by the CBO. The cost estimates, designed to inform members of Congress about the financial implications of the legislation, should it be enacted, broadly include the following: (a) the cost of establishing new programs, (b) the projected cost of savings from altering existing programs, and (c) anticipated changes in revenues, should tax laws be changed. In cases related to proposed changes in the tax code, the CBO is legally required to use estimates prepared by the Joint Committee on Taxation. All other estimates generally attempt to project the effects of the legislation at least 5 years into the future. Ten-year and longer projections, however, are not uncommon. Included with each estimate is a narrative explaining the specific methods used and the assumptions made in calculating the final figures.

CBO's estimates, which are often revised as a bill moves through Congress and is amended, play an important role throughout the entire legislative process, from preliminary bill drafting, through the design of floor amendments, to the final bill that emerges from the conference committee for a vote. Members of Congress, as well as various governmental agencies, policy research organizations, advocates, and many others, rely heavily on the expert advice provided to them by the CBO's cost estimates to determine how to allocate a limited amount of available funds.

Additionally, the Unfunded Mandates Reform Act of 1995 requires the CBO's cost estimates to inform the U.S. Congress if a piece of proposed legislation contains federal mandates to the states. If such a mandate exists, and the estimated cost to the states exceeds a predetermined threshold, the CBO must fully estimate these state costs in its reports.

The Federal Budget

The current federal budget is more than \$2.5 trillion. Each February, the President releases a budget proposal created by the OMB, which outlines the administration's priorities for the coming

fiscal year. Ultimately, however, it is the U.S. Congress that must create and pass a budget bill. For this reason, the CBO plays an important role in the federal budget process.

The CBO's first task is to reevaluate the president's budget and create a report to Congress that contains objective nonpartisan estimates of the President's proposals. In odd-numbered years, the CBO also provides Congress with a "budget options" report that lists literally hundreds of possible budget alternatives for the Congress to consider. In the spirit of political neutrality, however, the report makes no policy recommendations.

In January, the CBO also provides an annual report to Congress titled the *Budget and Economic Outlook*, which includes an economic forecast along with 10-year projections of federal spending and revenues. This report is useful to members of Congress when considering proposed legislation (and their corresponding CBO cost estimates) as it provides a baseline against which comparisons can be made. In addition to these publications, the CBO prepares analytical papers, policy and issue briefs, monthly budget reviews, and background and working papers. All the CBO's publications are available on its Web site.

Brad Wright

See also Centers for Medicare and Medicaid Services (CMS); Cost of Healthcare; Inflation in Healthcare; Medicaid; Medicare; Public Policy; Regulation; U.S. Government Accountability Office (GAO)

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CONSUMER-DIRECTED HEALTH PLANS (CDHPs)

Consumer-directed health plans (CDHPs) are insurance plans that combine two major design features: (1) a high-deductible health plan that provides catastrophic coverage, but places the consumer at risk for substantial spending, including possible cost sharing on amounts above their deductible, and (2) a tax-advantaged employer and/or self-funded individual savings account that can be used to pay directly for healthcare expenses and can be rolled over from year to year. A central claim is that by combining higher cost sharing with savings accounts, CDHPs can encourage more price-conscious purchasing by consumers and help contain costs while mediating exposure to the risk of large direct out-of-pocket payments. Other features often associated with CDHPs include exemption of certain services such as preventive care from deductibles and access to decision support tools "empowering" consumer decision making. Interest in CDHPs is relatively new and has centered on the private sector. In 2006, only 3% to 4% of the privately insured population in the United States were enrolled in CDHPs, but this represented a substantial increase over previous years, and enrollments could grow further in the future. Important issues raised by the growth of CDHPs include their design and relationship with managed care, their potential for future growth, and the possible implications of increased enrollments for access, costs, and quality of healthcare.

Background

CDHPs have emerged against a background of rising insurance premiums, dissatisfaction with managed care, and changing consumer attitudes about involvement in their care. Managed-care plans arguably played a major role in slowing the growth of healthcare costs in the 1990s by combining selective contracting with restrictions

on consumer choice, allowing them to reduce payments to hospitals and physicians. Key features included direct controls on utilization and the use of financial incentives to steer consumers to networks of contracting providers. However, since the late 1990s, there has been a growing consumer backlash against these restrictions. This has been accompanied by a shift in enrollment toward less restrictive types of managed-care organizations (e.g., moving away from health maintenance organizations [HMOs] toward preferred provider organizations [PPOs]), a relaxation of plan constraints on choice, and a re-acceleration in the growth of health insurance premiums. The combination of rising premiums and the push back against managed care has fueled interest in CDHPs as an alternative cost containment strategy or at least as a means of shifting some of the burden of cost increases toward consumers. At the same time, there has also been growing interest among consumers in greater involvement in decisions about their care and in CDHPs as vehicles for tax-advantaged saving.

Design and Operation

Typically, CDHP insurance plans include not only a high deductible but also substantial consumer cost sharing above this deductible until the consumer reaches a maximum stop-loss cap on out-of-pocket expenditures, at which point services are usually fully covered as long as they are obtained in the network. Consequently, insurance premiums will usually be lower than for coverage with a smaller deductible and less cost sharing, but there is greater risk exposure. In the individual insurance market, this trade-off between premiums and risk is explicit. In employer-based plans, the impact on a consumer will depend on an employer's decision not only about contributions to employee spending accounts but also about premium contributions.

Two major types of savings account arrangements are currently in use for CDHPs: (1) employer-based and funded Health Reimbursement Accounts (HRAs) and (2) personal Health Savings Accounts (HSAs) funded with individual and possibly employer contributions. HRAs are offered in conjunction with an employer-sponsored

insurance plan and are employer owned and administered. Along with employer contributions to insurance premiums, expenditures made from HRA accounts are tax-exempt, subject to Internal Revenue Service (IRS) review. HRA-based plans are usually defined as a CDHP in the literature if deductibles equal or exceed \$1,000 for single coverage and \$2,000 for family coverage. HRA funds may be rolled over from year to year. However, balances are generally nontransferable and revert to the firm if an employee leaves his or her job. Consequently, an employer's actual spending may be less than the amount contributed.

Based on a Henry J. Kaiser Family Foundation/Health Research and Educational Trust survey of employers, in 2006, the average employer contribution to employee CDHP HRA accounts was \$797 for single coverage and \$1,584 for family coverage. The average total premium for insurance associated with HRA plans, including both employer and employee contributions, was \$3,666 for single coverage and \$10,482 for family coverage, which compares with average premiums of \$4,242 and \$11,480, respectively, for all types of insurance plans combined. The average deductible for HRA CDHPs was \$1,442 for single coverage and \$2,985 for family coverage, and average out-of-pocket maximum stop-loss caps were \$2,693 and \$5,230, respectively. HRA funds may be used to cover both deductibles and coinsurance. However, because there is usually a gap between the employer's contribution and the maximum stop-loss cap in the typical HRA plan, unless a consumer has rolled over sufficient funds from past years, they are at risk for direct out-of-pocket payments to bridge this gap.

HSAs are regulated under Title XII of the Medicare Modernization Act of 2003. An HSA may be established in conjunction with either a qualifying employer-sponsored insurance plan or an individual purchase of qualified coverage. In either case, HSA accounts are personally owned and fully portable. Typically administered through an outside financial institution such as a bank or an insurance company, there are no income limits on who can contribute to an HSA, and they are triply tax advantaged—contributions to HSA accounts, earnings on account balances, and withdrawals for healthcare expenditures are all tax-exempt. Subject

to payment of regular federal income tax and a 10% penalty, HSA funds may also be used for other purposes. This penalty is waived at age 65, however, and unlike most retirement plans, there are no mandatory provisions for withdrawing funds from HSAs after age 65.

In 2007, to qualify for an HSA, a consumer had to be enrolled in a health insurance plan with a deductible of at least \$1,100 for single coverage and \$2,200 for family coverage and a maximum out-of-pocket spending limit of \$5,500 or less for single coverage and \$11,000 or less for family coverage, with both limits subject to adjustment for inflation. Combined contributions from individuals and their employers were limited to a maximum of 100% of the deductible, but not more than \$2,850 for single coverage and \$5,650 for family coverage, also subject to adjustment for inflation. Again, a substantial gap may exist between the maximum allowed contribution and the maximum cap on out-of-pocket spending, placing a consumer at risk for large potential out-of-pocket payments, where by law, purchase of first-dollar supplemental coverage is prohibited.

One widely expressed concern with CDHPs is that cost sharing may lead consumers to reduce spending on “necessary” as well as “unnecessary” services, resulting in higher costs and/or poorer outcomes. At least in part, this concern may be addressed by exemptions permitting reimbursement for services even if a consumer has not reached their deductible. By law, HSAs must exempt preventive services such as screening tests, while many HRAs do so as well. Some CDHPs also exempt expenses related to the management of chronic medical conditions such as diabetes and may offer consumers incentives to enroll in disease management and wellness programs. However, beyond this, deductibles, coinsurance, and copayments are typically applied using a one-size-fits-all approach. Possible refinements include further adjustments in cost sharing based on individual clinical characteristics and possibly income.

Another important concern is that even if consumers are motivated to shop for care, they are ill equipped to do so. Proponents of CDHPs argue that this can be addressed by empowering enrollees with decision support tools, for example, Web-based tools enabling consumers to compare prices and quality information. Many plans

provide such tools, but the literature suggests continuing problems. For example, it is often difficult for a consumer to obtain accurate, timely data on the prices that they can expect to pay for specific services and how much their plans will reimburse for them, let alone the anticipated overall cost of an episode of care at different providers. In this context, developing comprehensive bundled prices combining the costs of hospital and physician services could be an important factor in facilitating shopping. On the quality side, data on performance are often rudimentary, especially for physicians, while there are important issues with their interpretation.

Illustration of Reimbursement

Consider a consumer enrolled in an employer HRA plan with a deductible of \$1,500 and a 20% coinsurance rate for expenses above this deductible up to a maximum cap of \$3,900 for total eligible expenditures. Suppose the employer’s annual HRA contribution is \$800 and that the employer’s insurance plan includes a managed-care organization network and restrictions on reimbursement for out-of-network providers. In Year 1, suppose the consumer has no major health problems and spends a total of \$600 on health-care, including \$300 for preventive services. In this case, the consumer will be at risk for 20% of the cost of eligible preventive services ($20\% \times \$300 = \60) and the full cost of the remaining services (\$300), a total of \$360. Deducting \$360 from his or her HRA, no out-of-pocket payments will be required, and a balance of $\$800 - \$360 = \$440$ will be rolled over to the next year.

In Year 2, if the employer again contributes \$800, the total HRA balance will be \$1,240, but suppose that the consumer has major health problems leading to total expenditures of \$19,000. Suppose all these services are purchased from network providers and are fully eligible for reimbursement. The consumer will owe the first \$1,500 of the cost of his or her care (the deductible). He or she will also be required to pay 20% of the cost of care above the deductible up to the point where the total out-of-pocket spending (the deductible plus coinsurance payments) equals \$3,900. The HRA will cover \$1,240, but he or she will still have to pay \$2,660 ($\$3,900 - \$1,240$) directly out

of pocket. Assume again that in Year 3, they have large expenses (\$14,000), in which case, with no funds to roll over and an employer contribution of \$800, they will spend \$3,100 out of pocket (\$3,900 – \$800). Note, however, that as long as the consumer uses network providers, this amount (\$3,100) will represent his or her maximum risk exposure since expenditures above the stop-loss cap will be fully covered. (Note, out-of-pocket spending could be substantially higher if a consumer goes out-of-network for services and incurs expenses not eligible for reimbursement. However, this situation could also occur with conventional managed care and is not unique to CDHPs.)

From this example, it is evident that a CDHP can potentially expose a consumer to substantial financial risk and that he or she may face considerable complexity in navigating a plan's provisions. In addition, this example highlights an important limitation of typical CDHP cost-sharing strategies: Once a consumer reaches his or her maximum out-of-pocket stop-loss limit (or anticipates he or she will), there is no further incentive to control costs for services eligible for reimbursement. This issue is irrelevant for the vast majority of enrollees because their spending is below maximum caps. Nonetheless, it is an important design issue because of the high concentration of health-care spending (e.g., the top 10% of patients account for nearly 70% of total expenditures). A key challenge for CDHPs is to find ways to control high dollar expenditures either through restructuring of cost sharing or through alternative mechanisms.

Relation to Managed Care

It is possible to envision a system in which consumers individually enroll in CDHPs and independently shop for their care, and the primary function of plans is to pay claims and supply decision support tools. However, proponents of this kind of approach usually link it to major restructuring of healthcare markets. Currently, consumer cost sharing in CDHPs is usually complemented by continued reliance on major features of managed care, albeit repackaged in ways that may reduce sources of tension with consumers.

Thus, CDHPs typically continue to rely on selective contracting and use of provider networks

as a cost containment mechanism. However, for expenditures below the deductible, the issue of consumer choice is typically reframed in terms of how consumers want to spend their own money. Plan rules on what expenditures are eligible for reimbursement do not explicitly become an issue until a consumer exceeds the deductible. Plan networks may still be important in determining provider choices even for low dollar expenditures because of the price discounts they offer. Furthermore, the network a CDHP offers may be a major factor in consumers' enrollment decisions. But high deductibles effectively eliminate direct issues with the reimbursement eligibility of providers for the majority of consumers.

CDHPs also typically eliminate direct controls on utilization of low dollar services, a frequent source of conflict with consumers under managed care. Instead, efforts to affect consumer behavior are usually framed in terms of incentives (e.g., eliminating deductibles for preventive services and use of incentive payments to encourage participation in disease management and wellness programs). The literature suggests that plans may complement low dollar cost sharing with the use of case management to directly control utilization of high dollar services. The extent and stringency of case management by CDHPs is not well documented. But in any case, it is likely to involve only small numbers of consumers and to be a less visible source of conflict, although issues may still arise, for example, high-profile cases regarding access to experimental services.

Enrollment Trends

Currently, CDHPs cover only a very small percentage of Americans with private health insurance, but between 2005 and 2006 estimated enrollments grew sharply, rising from about 3 million to about 5 or 6 million enrollees. In 2006, an estimated 3 million of these enrollees were in employer-sponsored HRA plans, and 2 to 3 million were in HSA plans, including plans purchased individually.

In the employer group market, a 2006 Henry J. Kaiser Family Foundation survey found that 7% of firms offering health benefits provided a CDHP as an option and that 4% of covered workers were

enrolled in such plans. However, among firms not offering CDHPs, 24% indicated that they were either somewhat or very likely to offer such a plan next year. Large firms were more likely to offer a CDHP, while when small firms offered a CDHP, it was more likely to be the only option.

Studies of enrollment patterns for CDHPs find evidence of moderately favorable selection. Enrollees tend to be more educated and have lower levels of prior healthcare utilization. The evidence on age is mixed. Retirement savings opportunities are hypothesized to be an important consideration for enrollees in HSA-qualified plans, especially for higher-income individuals. The literature indicates that when consumers have a choice, they are more likely to enroll if CDHPs actively seek to educate consumers about the plan's features.

Cost and Quality

The RAND Health Insurance Experiment (HIE) provides strong evidence that high-deductible plans can reduce utilization, primarily through effects on a consumer's decision to seek care. Simulation studies using HIE data suggest that combining high deductibles with savings accounts would mediate the effects on utilization but that reductions could still be substantial. However, findings from the HIE raise concerns that consumers may reduce the use of "necessary" as well as "unnecessary" care, especially in the case of poor, sick consumers, while in real terms, deductibles in the HIE were much greater than those currently in use by CDHPs. Studies based on actual experiences with CDHPs remain limited, and issues exist with controlling for favorable selection and tracking out-of-pocket spending. However, the available evidence is generally consistent with at least onetime savings. The evidence on the effects on quality is mixed, with at least some evidence that consumers may adopt behavior that could have adverse health consequences.

Future Implications

Continued increases in private health insurance premiums could spur growth in CDHPs, especially if CDHPs can successfully realize even modest cost

savings compared with other plans. Even if they cannot, CDHPs may still be attractive to employers (and possibly the public sector) as a framework for shifting costs toward consumers through greater financial risk bearing. Greater familiarity with CDHPs could increase consumer acceptance, especially with more consumer education. But substantial numbers of consumers may remain reluctant to assume the financial risks involved and/or greater responsibility for shopping for their care. Other potential barriers to future growth include the lack of adequate decision support tools and issues with federal and state regulations governing HSAs.

An immediate public policy concern is the effect CDHP growth could have on insurance markets. The evidence so far suggests only modest favorable selection. However, a large-scale shift of more healthy, lower-cost individuals to CDHPs could leave other types of plans with a disproportionate share of more costly enrollees, potentially driving up premiums in those plans serving individuals with the greatest need for care. In addition, to the extent CDHPs redistribute financial burdens, there are concerns that risk could be disproportionately shifted to those enrollees least able to bear them, for example, individuals with severe chronic illnesses. In the longer run, a central question is the ability of consumer-directed strategies to generate sustained cost savings while ensuring the quality of healthcare.

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See also Coinsurance, Copays, and Deductibles; Cost of Healthcare; Forces Changing Healthcare; Healthcare Financial Management; Health Insurance; Health Insurance Coverage; Health Savings Accounts (HSAs); Managed Care

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- Employee Benefit Research Institute (EBRI):
<http://www.ebri.org>
- Henry J. Kaiser Family Foundation (KFF):
<http://www.kff.org>
- U.S. Government Accountability Office (GAO):
<http://www.gao.gov>

CONTINUITY OF HEALTH SERVICE OPERATIONS DURING PANDEMICS

The emergence of hazards related to the global transmission of pandemics presents challenges to local public health departments. It requires the planning of responses, not only with respect to the crisis itself but also with respect to the continuity of essential public health services during the crisis. Influenza pandemics have occurred several times during the 20th century, and there is a high probability that an influenza pandemic will occur again in this century. Such a pandemic will directly and indirectly affect the operations of public health departments, critical infrastructures, and private and nonprofit organizations. When the pandemic does occur, it will likely be with

little warning, and the novel flu virus may be identified in any region of the world. Experts believe that there will be 1 to 6 months’ time between the identification of the novel influenza virus and the time that widespread outbreaks begin to occur in the United States. Simultaneous clusters of disease are expected to occur throughout much of the nation, preventing the relocation of human and material resources. Multiple waves of infection are anticipated. The effects of an influenza pandemic will be relatively prolonged, occurring in estimated waves of 8 to 20 weeks’ duration.

Continuity of Operation Plans

With a possible influenza pandemic, governments at all levels must be prepared for the health crisis. The plans for the maintenance of services and the recovery of public health departmental capability after the crisis have been referred to as continuity of operations planning. Such plans describe the organization with its operational framework for continuing essential public health functions when normal operations are disrupted or otherwise cannot be conducted. At a minimum, the continuity of operation plans should meet several key objectives. The plans should identify prioritized essential functions and determine necessary resources to maintain these functions. They should also establish a command and control structure related to the management of personnel to maintain these services during the crisis. Other objectives of the plans should be to identify the triggers that would initiate the sequential phases of the continuity of operations and to list the necessary resources, such as people, equipment, and materials, to perform essential functions. Finally, the plans must establish procedures to acquire necessary supplies and support services to continue essential public health functions, as well as the capabilities to restore or reconstitute agency activities to their pre-event status.

The structure of the plans should be driven by the types of problems arising from the occurrence of pandemics and the necessity of maintaining certain services during a crisis. A public health department has to effectively reorganize its lines of authority, operations, and service provision to reflect a vastly different set of public health priorities. Plans must

be in place prior to the crisis, which define essential versus nonessential services so that nonessential services can be curtailed during the crisis. The distinction between an essential and nonessential public health service needs to be clearly understood. The designation of a nonessential service does not mean that such a service is not of vital importance to the public health of citizens. *Nonessential*, in this context, means that a service can be delayed for the period of 1 to 3 months without causing significant or immediate public health problems.

Beyond the definition of essential and nonessential services, other issues must be addressed in continuity of operation plans. The issues include the appropriate preparations to be made before the occurrence of a pandemic, such as the pre-ordering of pharmaceuticals for patients who may be unable to obtain them during the crisis. The training needs of temporarily reassigned personnel should also be considered. When preparing the plans, leaders also need to determine which changes should be made to departmental reporting and communication to allow management to create a unified situational awareness during the rapidly shifting conditions of the crisis. Finally, since a public health department depends on a network of services provided to it to function, the interactions between the department and service providers during the crisis must be addressed as changes in these interactions are expected. For example, emergency-contracting provisions may need to be created to allow the rapid ordering of urgently needed supplies.

Managerial Organization and Coordination

Continuity of operation plans need to be specified so that they are coordinated with pandemic response plans. Pandemic response plans are phased in using a number of specific trigger points. Such points may include the following: (a) activation of the Public Health Incident Command System (PHICS); (b) enhanced public health surveillance activity; (c) community containment, including quarantine and isolation, and the enactment of social distancing measures; (d) epidemiological investigation; (e) administration of pre-pandemic vaccines, and antiviral distribution; and (f) mass vaccination of the entire population.

These trigger points will initiate pandemic response actions, which will in all likelihood require the shifting of personnel in the public health department from nonessential services to the implementation of pandemic response activities. Therefore, for each of these trigger points, a parallel continuity-of-operation trigger point involving the termination of nonessential services exists.

The shifting of personnel raises a number of managerial problems within public health departments trying to respond to the pandemic. Due to the illness of key personnel, adjustments will have to be made in personnel assignments during the pandemic in order to ensure the continuity of essential services. It is likely that alternative work practices such as telecommuting will be employed more heavily during the pandemic influenza response. Such work practice changes require preparation and operational guidance to work effectively. If schools are closed, the rate of absenteeism at the department could increase significantly.

It is assumed that there will be at least a 2- to 3-week period of time prior to the diagnosis of the first case of pandemic influenza locally, when a city will have warning of the impending crisis. Preparatory action for the large-scale reassignment of personnel needs to take place. Other necessary preparatory actions may include the following: (a) pre-ordering medications for patients in anticipation of difficulties in filling prescriptions during a citywide pandemic influenza response, (b) just-in-time training for voluntary staff, (c) ensuring that computer network capacity for an increase in the use of home-based work practices exists, and (d) editing of public information alerts to be issued as nonessential services are curtailed.

The curtailment of nonessential services will require a coordinated public information program so that a coherent and consistent message is provided to the general public. Information on the damage due to the curtailment of nonessential services, such as patients not seen and health inspections postponed, will need to reside in a central location in order to assist in developing an effective postpandemic influenza recovery plan.

The maintenance of essential services during the influenza pandemic response will require an integrated command structure capable of responding to program-level problems and issues. Program managers will need to respond in a timely manner

so that specific resources cannot be made available for nonessential services during the pandemic response. This is just as important as responding positively to a program request for additional resources. Due to rapidly changing conditions, the continuity of operation management structure must be capable of significantly faster response than required in nonemergency conditions.

Defining Essential Services and Departmental Service Support

The process of defining essential services may take place by either a top-down approach or a bottom-up one. The advantage of creating a single criterion by which essential services can be defined based on interviews with upper management is that this approach will create a designation of essential services based on criteria that presumably will relate to some form of benefit cost considerations and could be easily communicated.

A bottom-up programmatic level-initiated definition of essential services will seek the views of each program manager. When each manager has input into classifying and determining essential and nonessential services during the response, the result is complex, and the process is more complicated than a single-criterion definition. A significant advantage to this approach, however, is the increased level of participation in the plan's formation by middle management and an increased level of acceptance of the plan once it is developed.

Regardless of the approach employed, the basic consideration in defining essential services is the implication for stakeholders of the damages resulting from the temporary cessation of nonessential services. The stakeholders in this case are the general public. Such damage assessments must consider not only the immediate damages due to the services postponed but also a potential difficulty in reestablishing the service after the crisis. In the assessments of essential and nonessential services, the potential development of resource constraints ultimately resulting in the curtailment of even some essential services must be considered. For this reason, even those services initially considered essential should be ranked so that adjustments to essential service levels may be made in response to shifting priorities and conditions during the crisis.

In making an assessment of essential versus nonessential services, regardless of the approach used, certain information should be collected to create continuity of operation plans. First, normal service and staffing levels should be examined. This information establishes the baseline from which the plans are developed and allows an estimate of the personnel resources released due to the cessation of nonessential services, which can be used to respond to the pandemic crisis. Next, information on the extent and severity of the impact of service cessation over different planning horizons should be considered. The number of people affected and the severity of impact will vary based on the service under consideration. The impact may also vary greatly with the length of time of the curtailment. Some services can be curtailed for short periods of time with little impact but may have significant impacts for longer periods, such as the provision of prescription drugs for chronic ailments.

Required staffing levels for essential services must also be determined. The designation of staff levels devoted to the provision of essential services during the crisis involves more than just defining the number of staff remaining in their program during the crisis. The continuance of essential services at a program may require a specific talent mix to function even at minimal service levels. Next, leaders must consider policy and practice alterations. A number of employment-related policies may have to be suspended or altered during the crisis. Personnel will be assigned to areas or jobs that do not appear in their job descriptions or to tasks for which they have not received extensive training. Different work practices may also be initiated to provide lower-quality or less resource-intensive service. The documentation of such policy and practice alterations is an integral part of defining essential services in a continuity of operation plan. Finally, information on external service requirements should be detailed. Public health departments are dependent on a variety of services from organizations within and outside the city, county, and state agencies to function under ordinary circumstances. Pharmaceutical companies, laboratory services, and information technology firms are among such support service organizations. During a crisis, this dependence continues, but it will be altered. The level of some outside

support services may decline due to the curtailment of nonessential services, while other support becomes more critical.

During this process, the pattern of dependence on agencies and organizations outside the public health department must be made explicit. Potential difficulties in maintaining support services from these organizations should be identified. Information regarding these organizations needs to be gathered as part of the continuity of operation plans. Such information may include the following: (a) the type and level of support services during noncrises conditions, (b) the impact of the pandemic on the organizations' capacity to continue to provide these services to support essential public health services, (c) the level of continuity planning that the organization has carried out to ensure continued support to the public health department, (d) the point of contact at the organization in the event of a pandemic, (e) the level and type of prepandemic preparatory plans, (f) contract or procurement issues that may arise during a crisis, and (g) preferred communication methods during the crisis.

Damage Assessment

The continuity of operation plans should not only be designed for the continuance of essential services during a pandemic, they should also lay the groundwork for the postpandemic recovery. A damage assessment at the end of the crisis will be required to determine the impact of the curtailment of nonessential services. Such an assessment requires that program managers maintain records during the crisis related to the impacts of reduced service. Some of the curtailed services will never be able to be provided after the pandemic. An extreme example of this would be a patient who died due to the reduction in normal services. A more typical case would be nonessential services that are capable of being backlogged until after the crisis, such as restaurant inspections. At the end of the crisis, each program will have to face the need both to resume normal services and to develop plans to dispose of backlogged services.

A damage assessment report should be developed that will allow upper management to make decisions regarding the allocation of

postpandemic recovery resources. The assessment will also help leaders estimate how long the process of recovery will take. The information required to make such decisions must come from program-level personnel as part of the damage report. At a minimum, the damage report should contain program-specific information regarding an assessment of the backlogged services created during the pandemic, a judgment regarding the priority of eliminating different types of backlogged services, and an estimate of the level of additional resources and time needed to eliminate the backlogged services.

Testing and Exercises

To be effective, the procedures developed in the continuity of operation plans will require the training of public health personnel. A testing, training, and exercise program includes activities to ensure that the public health organization is capable of supporting the continued execution of its essential mission and critical functions throughout the emergency response. The most effective method of training for emergency response procedures is in the form of exercises in which the personnel to be trained are presented with realistic scenarios that simulate pandemic management conditions. These exercises will also serve as a guide in the important process of maintaining the plans over time in light of changing conditions and personnel reassignments.

Future Implications

Deadly influenza pandemics have occurred in the past, and they will indeed occur in the future. To save lives and minimize economic and social disruptions, local public health departments must be prepared and ready to meet the challenge. During the pandemic, resources will have to be redirected, some services will have to be temporarily eliminated, and special attention will have to be given to essential services. To achieve the continuity of health services, public health departments will need to systematically organize, prioritize, and mobilize their efforts.

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See also Centers for Disease Control and Prevention (CDC); Community Health; Disease; Emergency and Disaster Preparedness; Epidemiology; Hospitals; Public Health; World Health Organization (WHO)

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- National Institutes of Health (NIH): <http://www.nih.gov>
- PandemicFlu.gov: <http://www.pandemicflu.gov>
- World Health Organization (WHO): <http://www.who.int>

CONTINUUM OF CARE

Continuum of care is a conceptual framework to organize all the health and related services that a

person may need over the course of time to deal with his or her health condition. This includes the coordination of complex care and multiple services that a patient may need to improve his or her health outcome. Continuum of care is defined as a client-oriented system of care that comprises both services and integrated mechanisms that guides and tracks patients over time through a vast array of health, mental health, and social services that span all levels and intensity of care.

Client-oriented refers to the healthcare system being designed around a client's or patient's need and not the insurance company's authorization for services or the provider's convenience. This concept makes every continuum potentially unique as each client has individual needs. The continuum of care concept is particularly relevant for clients with chronic disease conditions and with multiple comorbidities, whose clinical condition requires the coordination of many diverse healthcare services.

Healthcare must be approached in a holistic manner, particularly for those with complex and chronic illnesses. A person's physical environment, financial status, social support, and emotional well-being all affect health status. Therefore, the intertwining of health, mental health, housing, and social services should be considered to achieve prevention, cure, or disease management.

The aspect of the continuum of care model that guides and tracks a person over time assumes that the client needs assistance to navigate the many services available and to optimize the match of services to the client's needs. Additionally, the continuum maintains an ongoing record of the client's condition and care. Baseline information, service intervention information, and service use data, as well as costs and charges and outcomes data, are all evolving as integral to the prevention and treatment of individuals and populations.

Last, all levels of care refer to the potential need of a client for more or less intensity of care as the client's condition changes over time. For example, a person with a hip fracture may need surgery in an acute-care hospital and may then move to rehabilitation for a period of several weeks. Following this, the person may be discharged to his or her residence with home care or be discharged to a nursing home for further recovery. As the client's condition progresses, the services that are needed change, and ideally, the continuum of care facilitates this change.

Although quality, efficiency, and cost-effectiveness are not explicitly stated in the definition of the continuum of care, it is inherent in the model. When a full range of services is available to a client and matched to a client's need, essential information should be shared across providers, quality of care should be maximized, transitions should be efficient, and cost-effectiveness should be achieved. Client outcomes under a model of continuum of care should be better than under a fragmented system of care.

Overview

The concept of continuum of care started in the United States in the early 2000s. The notion was to create an organized and seamless healthcare delivery system to use limited resources most effectively. Despite this, comparative outcomes data that document the value of the ideal continuum form of organization remain a challenge. Nonetheless, they will become increasingly available as electronic health records and comprehensive patient information systems provide opportunities to evaluate clinical outcomes and cost-effectiveness. The continuum is shown graphically in Figure 1.

Services

A partial list of more than 60 services of the continuum of care is presented in Table 1. These services are grouped into seven categories: (1) extended care, (2) acute care, (3) ambulatory care, (4) home care, (5) outreach services, (6) wellness activities, and (7) housing. The categories do not have a fixed order. An individual client will use a unique combination of services in a sequential or simultaneous order appropriate for the person's condition. Thus, categories of services could be arranged by location (as they are in the diagram), by type of provider personnel, by the patient's functional status, or by any of a number of other variables.

Extended Care

Extended care refers to inpatient medical or nursing care over an extended period of time.

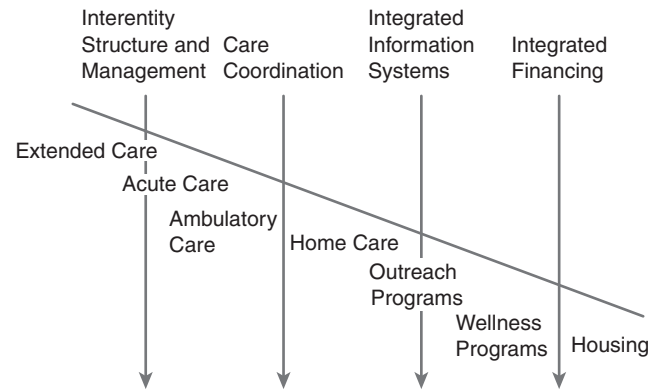


Figure 1 Services and Integrating Mechanisms of Continuum of Care

Source: Evashwick, C. Definition of continuum of care. In *Managing the Continuum of Care*, edited by C. Evashwick and L. Weiss. Gaithersburg, MD: Aspen, 1987.

Note: The services of the continuum are coordinated by deliberate integrating mechanisms.

Nursing facilities are the dominant providers of this level of care. However, others that might provide extended care for any given individual include rehabilitation hospitals, long-term care hospitals, assisted living in a state that allows a high health-care component, and intermediate care facilities for the mentally disabled in a state that allows a strong medical component. As federal and state regulations and nomenclature have changed, the providers in this category have varied.

Acute Care

Acute care refers to acute medical or surgical services provided by a licensed hospital. Acute care implies a short period of time. However, the majority of patients in today's hospitals have underlying diagnoses of chronic disease conditions. Thus, the acute inpatient stay is often just one episode in ongoing care. Many acute-care hospitals have services for those with chronic conditions, as well as the services designed for episodic care.

Ambulatory Care

Ambulatory care refers to medical and other health services provided on an outpatient basis

Table I Services of the Continuum of Care

Extended Care	Hospice
Nursing facilities	Durable medical equipment
Sub-acute units	Outreach Programs
Intermediate care facilities	Mobile vans
Long-term-care hospitals	Telephone reassurance
Rehabilitation hospitals	Senior services
Psychiatric hospitals	Friendly visitors
Other chronic-care hospitals	Parish nurses
Acute Care	Nurses in schools
Emergency rooms	Nurses in housing complexes
General hospitals	Wellness Programs
Specialty hospitals	Health education
Ambulatory Care	Health fairs
Physicians' offices	Exercise programs
Multi-specialty group practices	Workplace wellness
Outpatient clinics	Disease management
Ambulatory-care centers	Housing
Urgent-care centers	Independent housing
Community clinics	Assisted living
Adult day care	Continuing-care retirement
Home Care	Communities
Medicare-certified home health	Board and care
Private home health	Group homes
High-tech home therapy	

Note: The full continuum includes more than 60 services, grouped into seven major categories for convenience.

to persons who are not bedridden. Hospital outpatient clinics, ambulatory-care centers, physicians' offices, urgent-care centers, nurse practitioner clinics in rural areas, physical therapy clinics, and pharmacies offering consultation by licensed pharmacists are all examples of ambulatory care.

Home Care

Home, or the place of residence, is placed in the center of the continuum of care schematic because most people prefer to be at home, with care organized under the assumption that they reside and function as independently as possible in their home. Home care ranges from informal assistance provided by friends and families to care provided by formal, government-regulated organizations such as Medicare-certified home health agencies and hospices. The majority of care in the home is provided and paid for by families.

Outreach Programs

Outreach services represent efforts by formal providers and informal support services to reach people in their homes and communities. These services are typically less medically intense than those available in facilities with sophisticated equipment and a cadre of highly trained professionals. Examples of services provided by formal healthcare organizations include mobile vans operated by hospitals, health fairs conducted in community venues, and telephone monitoring offered by for-profit companies. Informal or volunteer services include programs such as Friendly Visitor, sponsored by Area Agencies on Aging, home-delivered meals organized by church volunteers, and telephone reassurance calls by volunteers organized by local community agencies.

Wellness Programs

These services are designed to help people stay healthy. They may occur at any location, from a

formal institution to a person's home. They encompass primary, secondary, and tertiary prevention, with goals that range from initial prevention of an acute condition to disease maintenance for a chronic condition. Examples of wellness activities include free fitness centers offered on-site by employers for employees, health education lectures held at hospitals, and pharmaceutical management programs that monitor potential drug interactions provided by mail-order pharmacies.

Housing

The home environment has a critical effect on a person's health. A child living in a house with lead paint is at risk for lead poisoning; an elderly person with a broken hip cannot return home as quickly to a residence in a three-story walk-up apartment as can a person residing in a one-story, easy-access ranch house. Assisted-living facilities have emerged during the latter part of the 20th century as the intersection between promoting independence and providing an environment rich in physical accessibility, service availability, and cost affordability. Many assisted-living facilities border on extended care, and they are distinguished only by state regulations on the amount of formal care allowed under each licensing category.

Integrating Mechanisms

The services of the continuum of care do not fit easily together in the nation's healthcare system. These services arose at different times to serve populations that might have been distinct at the time. State licenses, federal regulations, payment systems, and accreditation differ for each service. Thus, the rationale for fragmentation is historic. From the client's perspective, the need to integrate services is essential to obtain comprehensive care. Four basic integrating mechanisms are incorporated into the continuum of care definition. These mechanisms include (1) care coordination, (2) integrated information systems, (3) integrated financing, and (4) interentity management and structure. Other integrating mechanisms, such as physician management and state policy, could also apply to specific situations.

Care Coordination

This refers to coordination of clinical care. As is evident from the long list of services, clients may use many services over the years. Particularly for those with complex and/or chronic disease conditions, services change over time as conditions change. Ideally, clinical information would be shared across providers over time. For example, having a baseline assessment of a person's functionality prior to a stroke gives providers a basis on which to set goals for recovery.

Clinical care may be coordinated in any of several ways. Rehabilitation uses the model of an interdisciplinary team. Primary-care physicians often view themselves as the coordinator of medical care and are officially designated by managed-care organizations as the single person with the authority to authorize care by other providers, particularly specialists.

The role of the case manager, care coordinator, or service coordinator has evolved over the past three decades as a means for dealing with the fragmentation of services in the nation's healthcare delivery system. Case managers are often registered nurses, social workers, or even people with no specific professional degree or license but people who have taken formal training by their organization to coordinate the care of clients. The profession of case management has evolved to the extent that there are now nationwide professional associations of care managers, and insurance companies pay for case management functions just as they do for the services of other healthcare professionals.

Integrated Information Systems

The sharing of client information across service providers is still in its infancy. According to the ideal framework of the continuum of care, providers of all services will be able to access client information to understand disease state, environmental/social/financial dimensions that might affect health, prior treatments, service utilization patterns, and health outcomes. Ultimately, such record sharing is essential to achieve efficiency and cost-effectiveness of care for the tens of millions of people suffering from multifaceted chronic disease conditions. However, presently, information is held by each

individual provider, with only a minimum of information shared between providers on individual request. This puts clients at risk of duplicating medical tests and ineffective services, not matching services to the comprehensive state of the person's condition, and becoming ensnarled in complicated financial accounting and payment processes. There are several examples of integrated information systems that demonstrate both the value of such management information systems (MIS) and the cost and complexity of implementation. For example, the Veterans Health Administration (VHA), the largest multihospital system in the world, has implemented a comprehensive networked electronic patient clinical record system. The U.S. military has a patient clinical record system that enables a soldier in Hawaii to get blood drawn for a test; fly to Los Angeles and get the test results and start necessary medication; and then fly on to Frankfurt, Germany, and be tested to see if the medication is working—all within 24 hours. In the private sector, Kaiser Permanente has one of the best large-scale integrated patient clinical record systems in the nation.

Integrated Financing

For services to be provided according to a person's clinical need, financing must not be a barrier to care. In the United States, however, fragmented services, differing coverage by insurance companies, and many people without any health insurance coverage at all make integrated financing of healthcare a major challenge. Managed care, originally begun as health maintenance organizations (HMOs), is the conceptual model that makes financing of care on a service-by-service basis unnecessary. Under a capitated system, a person pays a monthly fee and is entitled to the full range of services covered by the insurance. With the HMO model, a broad scope of services is available from a single, organized multiservice provider. Thus, single financing matches the single provider. Kaiser Permanente and the VHA are, once again, good models of this type of system.

Over the past two decades, however, the move toward single source providers accepting capitated financing has dissipated as the nation's consumers have insisted on an unlimited choice of providers. At the present time, state Medicaid programs are

leading the main push toward enrollment in capitated systems, each with its own variation of payment and service organization parameters. Thus, payment for the continuum of care services remains highly fragmented, with a fragmentation in the provision of services as well.

Interentity Management and Structure

A full continuum of care need not be owned by a single entity, and it will most likely draw on several organizations that are linked through a variety of formal and informal mechanisms. To pull all the services and integrating mechanisms together, an integrated organizational structure must be present. This carries the inherent authority to ensure that the various components of the system work as effectively and efficiently as intended. Within a multiservice organization, this might take the structure of a service line, such as Cardiac Care, or a center of excellence, such as a Women's Center. Across providers, this might take the form of a preferred provider network or a multispecialty group practice that has its own hospital, home-care agency, and nursing facility. Formal transfer agreements articulate patient transfer terms in detail; informal relationships between two professionals who work together frequently may be equally effective at transferring client information but must be bolstered by formal agreements pertaining to legal and financial issues.

Clients

Although the continuum of care is client-oriented, the terms used to refer to clients reflect the multiple services encompassed in the continuum and the current lack of coordination among services. Table 2 shows select services and the terms by which they refer to the users of their services.

The clients of the continuum represent a mosaic of subsets of the population. Anyone might benefit from being part of an organized system of care. A healthy individual might access preventive services, wellness programs, and health monitoring. The greatest benefit of the continuum is to those who have complex, multifaceted illnesses requiring care from several service providers either simultaneously or over time. Segments of the population

Table 2 Terminology Used for Clients of Continuum Services

<i>Service</i>	<i>Name Used for Clients</i>
Hospitals	Patient
Nursing facilities	Resident
Hospice	Patient
Home care	Client
Adult day services	Participant
Assisted-living facilities	Resident
Physicians' offices	Patient
Pharmacies	Customers

Note: Each of the services of the continuum establishes its own terminology for the people it serves.

who are likely to benefit the most from an organized continuum of care include (a) the very elderly, 85 years of age or older, who are likely to have multiple chronic disease conditions; (b) people with severe chronic mental health problems; (c) children with special healthcare needs who require attention from health, welfare, and educational systems; (d) those suffering from debilitating strokes and other neurological conditions; (e) victims of Alzheimer's disease; (f) people with major functional disabilities; and (g) people with HIV/AIDS, chronic obstructive pulmonary disease (COPD), congestive heart failure, and other systemic chronic disease conditions that require constant and complex care. In short, the users of the continuum might have a physiological or mental condition as the primary diagnosis, suffer a permanent condition or curable illness, and be experiencing an acute episode of need. The commonalities include the use of multiple services offered by different providers, and thus the need to coordinate the services for clinical, financial, and patient well-being purposes is paramount.

Future Implications

In the early 2000s, healthcare that was organized as a comprehensive and coordinated continuum of care was the exception rather than the rule. Although large healthcare systems may have many of the services that make up the continuum, the majority of routine healthcare continues to be coordinated by individuals and their families

rather than physicians or case managers. Healthcare is likely to be more coordinated for those facing traumatic, disease-specific illnesses requiring multiple services over a relatively short period of time, such as cancer treatment or hospices for the terminally ill.

The VHA and the U.S. Armed Forces medical systems have demonstrated that a fully integrated continuum of care is feasible, and Kaiser Permanente has demonstrated that the continuum of care can be cost-effective. However, integrating financial streams remains a challenge. Furthermore, integrated information systems are increasingly sophisticated and expensive, organizational structures that match clients with services run counter to the American insistence on unrestricted choice, and state and federal policies pertaining to the continuum of care remain conspicuous in their absence. As the nation's population gets older and the proportion of individuals with multiple chronic disease conditions increases, the demand for coordinated care may outstrip the social preference for independence.

Until future demand creates change, the continuum of care model remains an ideal concept that helps structure individuals' thinking about how healthcare services should fit together and what must be done to accomplish the goal of having a comprehensive, coordinated system of care that provides high-quality care efficiently and effectively.

Connie J. Evashwick

See also Acute and Chronic Diseases; Case Management; Disease Management; Equity, Efficiency, and Effectiveness in Healthcare; Health Maintenance Organizations (HMOs); Long-Term Care; U.S. Department of Veterans Affairs (VA)

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 National Quality Forum (NQF):
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 U.S. Department of Veterans Affairs (VA):
<http://www.va.gov>

COST-BENEFIT AND COST-EFFECTIVENESS ANALYSES

Cost-benefit and cost-effectiveness analyses are widely used tools in health services research to control health spending and efficiently allocate limited resources. The purpose of cost-benefit and cost-effectiveness analysis is to compare the cost and value of different health interventions and technologies and to evaluate whether this leads to improved health and extension of life. The term *cost-benefit analysis* is used when the impact of the health intervention is measured in monetary terms. However, cost-effectiveness analysis does not use money to measure effects. Instead, cost-effectiveness analysis typically uses health outcomes.

Both cost-benefit and cost-effectiveness analyses help manage the efficient provision of health services and resource allocation while providing an understanding of the cost and outcomes of

various health interventions. This concept has become more important as health-related costs continue to rise. The federal government reported that national health expenditures in the United States amounted to \$2.3 trillion in 2007, with per capita health spending estimated at \$7,600. These sums have been projected to rise to more than \$4 trillion and \$12,320 per capita in 2015. Better use of cost-benefit and cost-effectiveness analyses can help reduce these projections or at least help ensure that resources allocated to the healthcare sector are justified by important health benefits.

Overview

A substantial part of healthcare expenditures is financed through insurance or a third-party payer. This renders many consumers insensitive to the actual price of healthcare, and they often shop on the basis of perceived quality. Healthcare providers, in turn, want to be regarded as "top quality" and often seek the latest technology to signal excellence to the consuming public. The pharmaceutical industry, medical equipment manufacturers, and medical electronics producers, to name a few, actively seek to meet this demand with new or at least differentiated products. Some have called this a medical arms race. At the root of it is a lack of cost-saving health technologies and a lack of confidence that money is being well spent. Money may be squandered with productive inefficiency, where inputs are not producing as much output as possible, or money may be squandered by producing output that is not sufficiently valued to cover the costs, were it not for insurance contributions.

Cost-benefit and cost-effectiveness analysis are used to address these problems of inefficiency by comparing two or more interventions. The analysis can be seen as a four-part procedure.

The Procedure

First, costs must be identified and measured. Generally, all relevant costs are measured, including those for the provision of health services and indirect patient costs, such as transportation costs and the value of lost labor output due to illness. Health service costs include direct costs, those that

vary with output, and indirect production costs, such as overheads, which do not vary with output. Allocations may be included for fixed costs such as buildings and equipment. Fixed and variable costs overlap with direct and indirect costs. For example, fixed costs may be direct or indirect costs. The same is true for variable costs. Allocations for indirect production costs need to be linked to the output of health services in an efficient and fair manner. For example, custodial or heating and cooling support costs can be allocated by the proportion of square footage used to provide the relevant health services.

Costs that are spread out over multiple years should also be discounted. Discounting accounts for the opportunity cost of capital, which is theoretically given by the marginal product of capital. The discount rate is also driven by an optimal rate of time preference. Under certain conditions, the marginal product of capital and the rate of time preference are driven to equilibrium. In practice, however, determination of appropriate discount rates is problematic. In applied settings, the opportunity cost of capital is given by interest rates, and these are sometimes used as discount rates even though they vary widely with inflation and risk. Some economists have questioned whether market interest rates can be used to appropriately measure time preference, especially for a social rate of time preference. Many economists have called for the use of discount rates that are lower than prevailing interest rates. In the 1990s, a consensus panel on cost-benefit and cost-effectiveness analyses in the healthcare sector recommended the use of a real (inflation-adjusted) discount rate of 3%.

The second step in the process is to identify and measure the impact of health interventions. Sometimes, these are intermediate outcomes, such as diagnostic accuracy, timeliness of intervention, or a physiological response. Many of these measures are generated in clinical settings, especially from medical research. More general health outcomes are also used. One approach is to use quality-adjusted life years (QALYs), which weight years of life for relative health impairment. A greater level of disability leads to a lower weighting given to a year of life.

Sometimes studies that use QALYs or similar tools to measure effects of health interventions are called cost-utility analyses. There has been some

controversy about cost-utility analysis. One concern is that the relative weights used to generate QALYs implicitly use social values and subjectively impose interpersonal utility comparisons. This contravenes a fundamental tenet of neoclassical economic theory.

Cost-benefit studies discount both costs and benefits. The discounting of nonmonetary effects in cost-effectiveness analyses is more controversial. This is sometimes done to reflect a social rate of time preference. But in other cases, it is not done because there is no opportunity cost of capital at issue.

The third step is to combine the costs and benefits/effects. This is done by generating an integrated measure such as a benefit-cost ratio in cost-benefit studies or cost per QALY in cost-effectiveness studies. A single stand-alone measure is of relatively little use. Far more useful is a comparison of how one intervention compares with another. This allows one to compare the relative efficiency of two or more interventions. For cost-benefit analyses, policymakers may choose the intervention with the highest benefit to cost ratio. Cost-effectiveness results differ somewhat. Table 1 illustrates the possibilities when comparing the relative cost-effectiveness of the status quo with a new technology. The most favorable result is the lower left box, where a new technology lowers costs and improves outcomes. The least favorable result is the upper-right box, where the new technology is associated with higher costs and worse outcomes. Such results are unambiguous, and medical decision makers can easily decide if the new technology is cost-effective. More problematic are results along the principal diagonal, where, for example in the lower right box, costs increase and outcomes improve. This is common in the health sector since this is the purpose of much technical innovation. But even here, cost-effectiveness analysis can be quite helpful. It can yield measures that provide information about how much additional cost is incurred for a given improvement in health. This might be in the form of a cost per QALY. A low cost per QALY is commonly regarded as a justified expense, while a very high one is often not seen to be economically prudent. A clear-cut threshold does not exist, but numbers such as \$100,000 per QALY have been put forward for advanced economies such as the United States.

The fourth step that is typical of cost-benefit and cost-effectiveness studies is sensitivity analysis.

Uncertainty is endemic in most such studies. There may be questions about the medical effectiveness of new drugs or procedures, and there may also be doubt about the exact cost of workers or of labor productivity. Frequently, there is uncertainty about the appropriate discount rate. A robust conclusion about cost-effectiveness should stand up to a wide range of estimates for key variables. Therefore, sensitivity analysis tests for this and shows how different values for key variables affect the result. Sensitivity analysis should be done for a reasonable range of values for all variables that might drive the conclusion.

It should be pointed out that cost-benefit and cost-effectiveness analyses do not necessarily provide information about the improved efficiency from a general equilibrium standpoint. That is to say, while cost-effectiveness analysis can show how a different approach compares with the status quo, it does not account for implications beyond the narrow confines of the healthcare interventions under study. A shift to a new technology, for example, might have implications elsewhere in healthcare or outside healthcare altogether that are very profound and can skew the net welfare gains one way or the other. However, this is rarely considered.

In reporting cost-benefit and cost-effectiveness studies, it is important to identify how costs and benefits/effects are distributed. Most economists are first and foremost concerned about net gains in welfare. But political scientists and others often emphasize distributive issues. A new intervention may be relatively cost-effective, but if the benefits fall primarily on the disenfranchised or otherwise

politically weak elements in society and the costs fall primarily on influential groups, the new technology may never be integrated into the fabric of medical or public health practice. Political forces are very important in the healthcare sector, and it is often the case that good policy is trumped by what leaders regard as good politics.

Application to Health Policy

Experience with cost-effectiveness analysis in the policy arena has shown that the policy processes by which health resources are allocated are generally not amenable to the strict use of benefit-cost ratios or cost per QALY as the only means to allocate health service resources. For example, a society may put a higher value on treating one person with a severe illness associated with a high cost per QALY compared with a widespread screening or treatment of a larger group of people for a less severe problem associated with a lower cost per QALY. Health risks are not always viewed in a linear or consistent fashion in society. We may bear a much higher health risk for some activities, perhaps operating a motor vehicle, than we do for other activities such as the use of common over-the-counter medications. This lack of consistency undermines the strict use of such economic methodologies. On the other hand, cost-benefit and cost-effectiveness studies are important tools for policymakers to decide how best to allocate scarce resources.

It is also common in reporting the results of cost-benefit and cost-effectiveness studies to identify key

Table I Cost-Effectiveness Matrix

	<i>Lower Cost</i>	<i>Same Cost</i>	<i>Higher Cost</i>
<i>Worse Outcome</i>	Ambiguous	Less efficient	Less efficient
<i>Same Outcome</i>	More efficient	Ambiguous	Less efficient
<i>Better Outcome</i>	More efficient	More efficient	Ambiguous

limitations of the study. Perhaps there are doubts about the data and how it can be generalized for wider applications. The population studied may limit the study, and results may not be relevant in other settings, or perhaps technical change is so rapid that the study results may no longer be valid. A wide variety of limitations may exist, and important ones should continue to be identified.

Future Implications

As healthcare costs continue to rise, cost-benefit and cost-effectiveness analyses will continue to play an important role in controlling healthcare spending and the use of scarce resources more efficiently and prudently. As healthcare costs and the benefits of health interventions are increasingly scrutinized, cost-effectiveness and cost-benefit analyses will be central to evaluating new technologies to examine if they lead to improved health outcomes and are justified compared with the relative expenditures and other available options.

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See also Cost Containment Strategies; Cost of Healthcare; Equity, Efficiency, and Effectiveness in Healthcare; Health Economics; Pharmacoeconomics; Quality-Adjusted Life Years (QALYs); Technology Assessment; United Kingdom's National Institute for Health and Clinical Excellence (NICE)

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- Tufts-New England Medical Center Cost-Effectiveness Analysis Registry: <https://research.tufts-nemc.org/cear/default.aspx>

COST CONTAINMENT STRATEGIES

Cost containment can be defined as reducing the level or rate of increase in healthcare costs. During the past decades, healthcare spending in the United States has grown at a much faster rate than has the general economy. Total healthcare spending increased at rates well in excess of the nation's gross domestic product (GDP). In 2006, total healthcare spending was \$2.1 trillion, representing 16% of the nation's GDP. These figures are expected to greatly increase in the future. By 2016, with a projected average annual percentage growth of 6.9%, the nation will spend a total of \$4.2 trillion, or 20% of its GDP, on healthcare.

There are many factors increasing healthcare costs, including general inflation within the economy, inflation specific to the healthcare industry, overall population growth, the growth of the elderly, health insurance, and new medical technology. Although there is debate over which specific factor contributes the most to rising healthcare costs, it is clear that these costs must be contained in some way. And a number of different strategies have been developed and proposed to contain the costs.

Efforts to Control Healthcare Costs

The primary method of controlling rising healthcare costs is giving incentives for providers to operate with reduced or controlled financial resources. Supply factors, particularly increased national medical capacity, are believed to be more important than demand factors in explaining the high use and costs of the nation's healthcare. Efforts by the public sector to contain healthcare costs have focused mainly on controlling the levels of and increases in payments to providers. In contrast, the private sector has focused on managing and controlling access to healthcare.

Public-Sector Efforts

In the public sector, the most important cost containment strategies have focused on the Medicare and Medicaid programs and on healthcare capital spending through state Certificate of Need (CON) programs.

Medicare's Prospective Payment System

To control community hospital costs, Medicare implemented the prospective payment system (PPS). The PPS sets hospital payments rates prior to when care is given. By setting a fixed reimbursement level based on diagnosis, prospective payment provides economic incentives for hospitals to conserve the use of their input resources. Hospitals that use more resources than covered by the flat rate lose the difference, while those with costs below the rate retain the difference.

Medicare's Resource-Based Relative Value Scale

To control physician fees, Medicare implemented the Resource-Based Relative Value Scale (RBRVS), which pays physicians for the various services they provide based on the amount of expertise needed, how much time they spend with the patient, and other factors. By using the RBRVS and changing the level of payment, certain high-growth, highly profitable services, such as endoscopy and ambulatory cardiac monitoring, may be slowed and not be overused.

Medicaid

State efforts to control the costs of healthcare have focused on Medicaid, which is jointly funded by the states and the federal government. In their efforts to control costs, states have used their discretion to determine who is eligible for Medicaid, what optional benefits to provide, and how much to reimburse providers. The various state efforts at cost containment have found the following: (a) one of the most effective means of managing costs is to limit access to the program; (b) states that set broad eligibility levels often accompany them with tightly regulated provider payment rates; and (c) states that include all payers in their cost containment strategies appear more effective than states with more limited (Medicaid-only) interventions in controlling costs.

Certificate of Need

The CON program is a regulatory process that requires hospitals, nursing homes, and other healthcare providers to obtain state approval for the expansion of their facilities or for major capital equipment purchases. The CON program intends to prevent unnecessary duplication of services by selecting the best proposal among competing applicants that wish to provide a particular health service. CON may have a significant effect on the capital spending of providers. However, empirical results on the effectiveness of CON programs on controlling the costs of healthcare have been mixed.

Private-Sector Initiatives

Employers have attempted to limit the rise in healthcare costs by increasing the share of costs paid by workers; managing the supply of care; and self-insuring their companies. Efforts by employers to control costs have also focused on the management of specific health benefit programs. These efforts have relied on innovative designs to reduce unnecessary use of medical care services and to negotiate lower provider payment rates.

Cost Sharing

Insurance coverage may lead to the overuse of healthcare by the insured. Cost sharing (e.g.,

coinsurance or deductibles) can be used to reduce the demand for healthcare services and thus to reduce spending. When consumers are paying some or all the charges for healthcare services, they tend to use fewer services. The famous RAND Health Insurance Experiment (HIE) demonstrated that cost sharing can be an effective means of reducing healthcare utilization levels.

Managed Care

Managed care, typically provided by health maintenance organizations (HMOs) and preferred provider organizations (PPOs), has been viewed as a means of controlling healthcare costs. These organized delivery systems provide or arrange to provide a coordinated continuum of care to a defined population. These systems are both clinically and fiscally accountable for the outcomes and health status of the population they serve. By combining the clinical and fiscal accountability, managed care creates incentives for keeping people well by emphasizing prevention and health promotion practices. When their members become ill, they treat them in the most cost-effective manner, which often limits their hospitalization.

Consumer-Directed Health Plans

Consumer-Directed Health Plans (CDHPs) are a recent attempt at cost containment. The plans have three elements: (1) medical saving accounts (MSAs), (2) high-deductible health insurance plans, and (3) detailed information on healthcare providers. Individuals and companies make tax-free contributions, up to a certain amount, into a special savings account, which can be used to pay for medical expenses. Unused funds are carried over to the next year. To protect against the costs of a major illness or accident, the individual must also have a high-deductible health insurance plan. Last, for individuals to be wise consumers, they must have access to information on provider's costs, quality, and outcomes enabling them to "shop around" for the best services.

Increased Use of Appropriate Care

This strategy generally envisions some combination of research to identify more effective ways to

treat conditions, education to persuade physicians to use more effective care, and precertification or utilization review to prevent unnecessary care. However, there is much controversy surrounding estimates of how many procedures are medically unnecessary, and there is no evidence as to whether the proportion of unnecessary procedures has grown with time or whether medical services that are growing in frequency are more likely than others to be performed inappropriately.

Limit Coverage of Services

Private insurers limit the services they cover through specific exclusions, financial limits, or limits on coverage according to circumstances. In addition, many insurers exclude specific services that they deem to be experimental or ineffective.

Healthcare Reforms

Some health services researchers and policy analysts argue that the only effective way to control the nation's healthcare costs is through some form of major healthcare reform. These reform efforts may include the following: establishing a single payer system, the use of expenditure targets, global budgets, and rationing healthcare.

Single-Payer System

Cost savings and greater cost control may be achieved by having a single payer or a single set of rules applying to all payers. Canada and the United Kingdom both use a single-payer system. Uniformity enables the system to control costs and minimizes cost shifting and reduces the administrative costs of dealing with multiple payers. However, there is concern that a single-payer system would discourage innovation, decrease consumer choice, and limit market forces.

Expenditure Targets

This strategy relies on creating a target level for total healthcare expenditures. The target is enforced by rules that any expenditure above the target will trigger future reductions in payments per service or coverage. Such targets can be applied across all

providers or to groups or individual providers. Expenditure targets differ from global budgets in that they are a policy goal rather than an absolute limit on spending, and they trigger payment reductions that apply to future years rather than to the current year.

Global Budgets

Global budgeting approaches are common in countries where their healthcare systems operate within a national budget. Global budgets differ from expenditure targets because they contain a formal management process to ensure staying within the budget. The Clinton administration's national healthcare plan proposed using global budget caps to limit healthcare spending. The proposed plan specified that beginning in FY1999, premium amounts for regional health alliances would not be allowed to increase faster than the sum of population growth and the projected increase in the Consumer Price Index (CPI). In later years, total healthcare expenditures would be allowed to rise at the growth rate of the GDP. It was believed that managed competition alone, without global budgets, would not slow the rate of increase in healthcare costs.

Rationing Healthcare

Rationing healthcare involves planning decisions to not create or to eliminate the capacity to produce healthcare services that are currently used or demanded but are judged to be "unnecessary." This process means that patients will be denied care that either they or their physicians want. Many plans for controlling healthcare costs limit supply by restricting the funding available per person and then decentralize decision making and financial responsibility to levels such as the state (for Medicaid), and HMOs, or a health authority (United Kingdom). These strategies are intended both to provide incentives for greater efficiency and more appropriate care and to allow some local flexibility in living within a fixed budget.

Future Implications

Despite much effort, there is little evidence that cost containment strategies have been successful.

The rising health insurance premium costs suggest that managed care has largely failed. And the effects of cost sharing on health expenditure growth over time are less clear. In addition, there are growing concerns about the possible negative effects of healthcare cost containment strategies on access to care and the quality of care. Furthermore, cost containment may decrease innovations in medical technology. Nevertheless, healthcare cost containment remains one of the most significant issues facing the nation.

Tae Hyun Kim

See also Consumer-Directed Health Plans (CDHPs); Cost of Healthcare; Healthcare Financial Management; Healthcare Reform; Health Economics; Payment Mechanisms; Prospective Payment; Rationing Healthcare

Further Readings

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Healthcare Financial Management Association (HFMA):

<http://www.hfma.org>

Leapfrog Group: <http://www.leapfroggroup.org>

National Coalition on Health Care (NCHC):

<http://www.nchc.org>

COST OF HEALTHCARE

In 2006, the latest year for which data are available, the United States spent \$2.1 trillion on healthcare. This is equivalent to just over \$7,000 per person and accounted for 16% of the nation's gross domestic product (GDP). National healthcare expenditures are the sum of many different types of healthcare spending, but chief among the types are hospital care (\$648.2 billion, accounting for 30.8% of the total), physical and clinical services (\$447.6 billion, 21.3%), prescription drugs (\$216.7 billion, 10.3%), and home health and nursing home care (\$177.6 billion, 8.4%).

Total healthcare spending equals the prices that people pay for specific types of medical services—the costs of healthcare—multiplied by the quantities of each specific type of care they received. Thus, while the costs of healthcare and healthcare spending are often used interchangeably, they are not the same. The common substitution of spending for costs in this context occurs in large part because total spending is a cost to individuals and to society. How much individuals spend on healthcare involves resource allocation decisions; spending on healthcare has an opportunity cost in terms of income that cannot be spent on other goods and services.

This entry begins by examining the tenuous link between healthcare costs and prices, and how prices for healthcare services are set. The discussion then shifts to why healthcare spending has been growing at rates exceeding population growth and income growth, and why that difference is viewed by many analysts and policymakers as a looming problem for the United States as well as other nations.

Healthcare Costs and Prices

The cost of anything is generally the price at which it is bought. In a competitive market, the price equals the marginal cost of producing the good or service. The cost in turn depends on the prices of the raw materials and labor and the production process that is used to create the product.

In the case of healthcare, the link between the marginal cost of producing a service and its price is loose at best. Markets for healthcare services are not competitive, in large part because information problems are significant in these markets. Most people do not have the medical knowledge necessary to diagnose what various symptoms mean; most physicians cannot keep track of all the new pharmaceuticals that are available; and health insurance shields people from asking and knowing the prices of alternative services and healthcare providers. The result is that the standard economic model of how prices are set and how they relate to costs of production is not a realistic portrayal of price setting in healthcare markets.

Healthcare prices are set primarily by negotiations between insurers and healthcare providers and by administrative decisions by insurers. Politics also affects Medicare and Medicaid decisions about how much they will pay for specific medical services. Representatives of hospitals, specialty groups of physicians, nursing home operators, and pharmaceutical manufacturers all lobby the U.S. Congress and state legislators about the Medicare and Medicaid reimbursement rates.

Setting Prices for Healthcare Services

Prices for healthcare services are set in a number of ways. Providers can be paid a fee for each service provided—what is often called fee-for-service pricing. Prices may be set as fixed amounts that will be paid for providing any necessary services for treating a person's specific disease or condition. This predetermined or prospective fee method can be expanded and a fee may be set to cover all medically necessary services for a person for a specified period of time, usually a year. This is usually referred to as a capitated payment (a payment per capita). Another method of setting prices is

known as cost-based reimbursement—this is often used when a medical service is new and so there is little information on the costs of providing the service and there is an expectation that the costs will decline over time. Finally, lump-sum payments or block grants can be used to pay providers. In this case, physicians are paid a salary, and hospitals, nursing homes, and other institutional providers are given a budget for operating costs related to an expected number of people needing their services during a year.

Fee-for-service pricing has its roots in how physicians set prices for hundreds of years: They charged a fee for each service provided. In the days when physicians did not have many options for how to diagnose or treat symptoms, the fees were generally in proportion to the length of time a visit lasted—a brief visit or a longer visit. Similarly, when hospitals began to proliferate in the late 1800s, they set prices as per diem prices. As Blue Cross and Blue Shield health insurance plans and commercial insurance grew in the 1930s, they initially sold indemnity policies that reimbursed enrollees a set amount per day in the hospital or for a surgery or physician visit. The indemnity payments were tied to norms of physician and hospital fee-for-service pricing. When Medicare began paying providers in 1966, the payments were intentionally set to follow the lead of the Blues and the commercial insurers. Medicaid and its predecessor state programs also based their payments to providers on the basis of fee-for-service pricing, but Medicaid has always discounted the fees and paid between 50% and 60% of the fees.

Prospective pricing has its roots in the managed-care movement in the nation and the original health maintenance organizations (HMOs). The initial version of prospective pricing paid groups of physicians capitated payments for taking responsibility for all the healthcare needs of a group of people during the year. During the late 1980s, as more forms of managed-care plans proliferated, many physicians were enthusiastic about being paid prospectively. They thought that they could make more money under this pricing system than with fee-for-service payment schedules. Support for it soon faded, however, as physicians realized they could be at risk for large sums of money if an

unexpected number of patients became very sick. Nonetheless, prospective payments are still used by many managed-care plans to price payments to physicians to take care of patients' predictable medical care during a year. In 1983, Medicare implemented the prospective payment system (PPS) to pay hospitals. The PPS is based on the average costs of caring for a person with a diagnosis that fits within approximately 500 Diagnosis Related Groups (DRGs). The costs are adjusted for each hospital, and adjustments are also made for the costs of labor in the geographic area where the hospital is located. Medicare has also developed a similar prospective payment pricing system for skilled-nursing facility services.

It may seem odd to discuss cost-based pricing of some medical services when the costs are so difficult to determine in healthcare markets. However, even cost-based pricing is not determined by competition; rather, the cost basis is arrived at through negotiations between providers and payers. As noted earlier, cost-based prices are generally used to set reimbursement fees for new medical or surgical procedures and new diagnostic equipment when there is an expectation that within a period of time the costs will be lower. They will decline because after a learning period, physicians will be able to perform the procedures with less time and effort, and the new machinery will become less expensive per unit as more are produced. The payments for about 40% of the Medicare DRGs are cost based rather than set prospectively.

Pricing physician time and effort is viewed by many as both problematic and unseemly. This can be particularly true when it is difficult to judge the quality of individual physicians or when a society is trying to create greater income equality. Paying physicians a salary is another way in which a price for physician expertise and time has been set. The U.S. Department of Veterans Affairs (VA), the United Kingdom's National Health Service (NHS), and a large number of countries' public health services pay physicians a salary. The salary is compensation either to take care of a number of people who live near the physician or to see patients during specified hours during a week. Similarly, operating budgets for hospitals often are determined as part of the budget determination process of countries,

counties, and municipalities. Such fixed budgets are related to the expected number of people from the surrounding area who will be hospitalized. Prospective payments, salaries, and set budgets are quite similar, but each has slightly different incentives for how care is provided and how underlying costs are minimized.

Prices Paid by Private Insurance, Medicare, Medicaid, and the Uninsured

Since the early 1980s, Medicare and commercial insurers have become more aggressive about setting the prices they will pay for a wide variety of hospital, physician, and other providers' services. The Medicare reimbursement rates have become progressively more formulaic for physician services, and prospective, fixed rates are used for most hospital and skilled-nursing facility care. The Medicare reimbursement rates take into account geographical differences in the costs of labor and other factors such as electricity and rent of offices. Commercial insurers, including nonprofit plans, have negotiated reimbursement rates that often follow the fee schedules and rates set by Medicare. Managed-care plans have experimented with various forms of prospective and capitated payments to physicians and physician groups. Starting in the early 1990s, when a majority of states started to move Medicaid recipients into managed care, the rates paid to managed-care plans have been negotiated or administratively set by the states.

For people with private health insurance or those who are covered by Medicare and Medicaid, these different reimbursement mechanisms effectively set the prices for healthcare services. The only people who pay healthcare providers' "usual and customary" stated charges, which can be set however the providers want, are the uninsured—they do not have an insurance plan administratively setting the prices or negotiating discounts off the charges.

Growth in Healthcare Spending and Its Costs

Since the 1960s, national healthcare expenditures in nominal dollars have grown from \$26.9 billion to \$2.1 trillion in 2006. If general price inflation and population growth are accounted for, healthcare

expenditures per person rose from \$960 in 1960 (in 2006 dollars) to \$7,026 in 2006. The share of GDP spent on healthcare more than tripled, rising from 5.1% to 16.0%. The growth in healthcare spending as a fraction of GDP is not without costs—it influences the allocation of the nation's resources and drives up the cost of health insurance, which affects individuals' incomes and decisions about how they spend their incomes as well as employers' decisions about sponsoring health insurance for employees.

Effects of Various Factors on the Growth in Healthcare Spending

The growth in healthcare spending per person is due to a number of factors. Although the aging of the nation's population is often raised as a factor, the best estimates are that it was responsible for only a small share (7%) of the increased spending between the 1950s and late 1980s. Since 1960, health insurance policies have covered more services, and the fraction of the population covered by insurance has increased, especially because Medicare and Medicaid were implemented. Greater insurance coverage increases the demand for healthcare, since people do not face the full cost of such care. But the best estimate is that the greater insurance coverage is responsible for only as much as 10% of the growth in per capita healthcare spending through the late 1980s. Rising incomes can also contribute to increased demand for care, and incomes have risen since the 1960s, especially for the top half of the income distribution. It is difficult to disentangle the effects of increased individual incomes from the effect of greater overall national wealth, which contributes to growth in medical technology. Nonetheless, the best estimate is that increased income accounted for something between 5% and 25% of the growth in per capita healthcare spending through the late 1980s.

Between 1960 and 1990, the federal government increased funding for medical schools and encouraged foreign physicians to emigrate to the United States so as to increase the number of physicians per capita. Some analysts believe that the increased number of physicians per capita contributed to increased spending. This explanation is often tied to a belief that physicians induce demand for their services—either to gain more income or to avoid

malpractice lawsuits. But the evidence does not support these explanations for the rate of growth in healthcare spending per person between 1960 and 2005. At most, the increase in physicians per capita accounts for a 1% increase in such spending.

Other explanations for the growth in spending include the consumer price index and the fact that productivity gains in medical care treatment are very difficult to measure. The result of the measurement problem is that it is empirically difficult to decompose the increase in medical expenditures into the share due to increases in prices and the share due to increases in quantity of services provided. In sum, all these factors appear to explain no more than half, and more likely only a quarter, of the growth in healthcare spending per person since 1960.

Technological Change and Increased Capabilities in Medicine

What then explains the remaining 50% to 75% of the increased healthcare spending per person? The explanation that most healthcare economists favor is technological change in medicine that has increased the capabilities of medical care. Proving that technological change is the primary source of the enormous growth in per capita healthcare spending is difficult; the evidence for it is primarily circumstantial. First, medicine has changed dramatically since 1960. People now survive diseases such as cancer, congestive heart failure, and renal disease that they would have died from quickly in the 1960s. The quality of life for people with a variety of non-life-threatening conditions, such as orthopedic problems, arthritis, and eye conditions, is enormously better today, with a wide variety of pharmaceuticals and joint replacement surgeries that have been developed within the past three decades. Some of these medical advancements have reduced the cost of treating some diseases (e.g., laser cataract surgery), but most have high costs. Spending has increased because the new technologies have been covered by health insurance and most people are insured.

Second, hospital care accounts for the largest share of healthcare spending—since 1960, it has accounted for between 30% and 40% of national healthcare expenditures. But the fraction of people being admitted as inpatients to hospitals has not

increased, and the average length of stay in hospitals has declined over the past five decades. Thus the 10-fold increase in inflation-adjusted total hospital spending strongly implies increased intensity and amounts of care being provided to those who are hospitalized. Hospital staffing and wages have not increased enough to explain this large an increase in spending per hospital stay; technological changes seem far more plausible. Moreover, more types of surgeries and diagnostic tests have become outpatient procedures that do not require an overnight stay in a hospital—and much of this shift has been made possible because of technological changes. The shifting of surgeries and diagnostic procedures to outpatient care has had the effect of increasing the degree of medical difficulty (the case-mix) of hospital inpatients. In spite of this, however, the average length of a hospital stay has declined, which is consistent with the hypothesis that technological change is responsible for the majority of the increase in healthcare spending.

Finally, the rate of increase in healthcare spending for managed-care plans, especially those with tighter controls on patient access to specialists, has been the same as that of health plans that paid providers on a fee-for-service basis. Similarly, the rate of increase in healthcare spending in the United States has been about the same as that of most industrialized countries, especially since the 1980s. This is in spite of very different levels of spending per capita, ratios of healthcare personnel per capita, and financing mechanisms. The similarity in rates of growth for both of these comparisons suggests that a common factor is the explanation—and improvements in medical technologies affect all these different health plans and countries.

Skewed Distributions of Healthcare Spending and Technological Change

The distribution of annual healthcare expenditures per person is very skewed—a relatively small fraction of the population is responsible for most of the spending in a year. Half of the population spends less than \$500 per year on healthcare, including one fifth who have no healthcare expenditures either because they do not get sick enough to seek care or they simply do not seek medical care. Altogether, this half accounts for only 3% of all spending. People with annual expenditures that put

them in the top 10% of the expenditure distribution are responsible for about 70% of all healthcare spending. To be in the top 10% of the population in terms of healthcare spending, a person would have had expenditures above \$15,000 in 2005. The threshold for the top 2% was \$30,000, and the threshold for the very top 1% was \$50,000.

People in the top 1% or 2% of the medical spending distribution are very sick—and new medical technologies that allow them to live are driving the expenses. The group includes people who need very costly pharmaceutical treatments to stay alive (e.g., people with rare forms of hemophilia), premature babies, people with spinal cord injuries, and people who have had organ transplants or cardiac events, including strokes. Until two or three decades ago, there was very little that medical providers could do for people with these conditions. Among the 15 most costly medical conditions in 1997, the three with the largest shares of total spending were heart disease (10%), cancer (8%), and trauma (8%). An analysis of the same 15 most costly diseases and conditions found that when the increased expenses for them between 1987 and 2000 were decomposed into spending versus treated prevalence (i.e., the number of people per 10,000 who were treated for the condition), seven had higher spending because of increased costs and not greater prevalence of treated people. The seven include the three most costly conditions (heart disease, cancer, and trauma) and pneumonia, skin disorders, hypertension, and infectious diseases. The fact that spending on these conditions increased because of significant medical advancements in treating these conditions rather than an increased prevalence of people being treated provides further support for the hypothesis that technological change is driving the increases in spending. It also contributes to the skewed distribution of healthcare spending.

Benefits and Costs of the Growth in Healthcare Spending

Technological changes and expanded medical care capabilities have improved many millions of people's lives. Improvements in many older Americans' quality of life have meant that they are not only living longer lives but they are also enjoying those years more. At the other end of the life

cycle, advances in neonatology are enabling babies to live who more than 30 years ago would have died before they were a year old. Similarly, advances in medicine's understanding of immunology, genetics, and a wide range of diseases and new engineered drugs have allowed people to be long-term survivors of diseases that were untreatable just two decades ago.

In spite of these benefits, it is not clear that the increases in spending have improved most people's lives. Americans do not have higher life expectancies than citizens of other industrialized countries. Moreover, within the United States, regions that have higher per capita spending do not have significantly better health as measured by a variety of health outcomes.

Furthermore, the pace of per capita healthcare spending has been faster than the growth in median income, general price inflation, and productivity of the average worker. The result is a fact noted earlier—national healthcare expenditures have grown faster than the GDP since 1960 and accounted for 16% of the GDP in 2006. The federal and state governments were responsible for about 45% of the total spending on healthcare (with Medicare, Medicaid, and the State Children's Health Insurance Program (SCHIP) being the largest of the public programs), and Medicaid now accounts for the largest share of many states' budgets. The Congressional Budget Office (CBO) estimates that federal spending on just Medicare and Medicaid will equal 4.6% of the GDP in 2007 (or almost a quarter of the entire federal budget). The CBO also estimates that federal spending on these programs will grow to 5.9% of the GDP in 2017—a nearly 30% increase in just a decade.

These increases in the shares of the economy and the budgets of the federal and state governments that go to healthcare are imposing a cost on the nation. They are preventing the nation from spending more on education, national defense, construction of mass transit and infrastructure, environmental cleanup, investment in alternative energy sources, and a host of other priorities.

Future Implications

New medical technologies and improvements in medical capabilities are the primary forces behind

the growth in healthcare spending. Efforts to slow the growth in healthcare spending therefore must involve incentives to innovators to create new medical technologies that reduce the cost of care and restrictions on which future medical technologies advances will be paid for by private insurance, Medicare, and Medicaid. Prestigious prizes and honors could be used as incentives for inventors to create cost-reducing technologies. Ultimately, however, restrictions on access to new technologies may be the most effective way to encourage the development of cost-saving new medical technologies.

One mechanism for restricting access to new technologies involves cost-effectiveness analysis (CEA). CEA is a method for estimating the additional cost per quality of life-year provided by a new drug or new procedure relative to the status quo way of treating a particular disease. If the additional cost is estimated to be below a threshold (often \$50,000), it is generally viewed as cost-effective; otherwise, the new treatment is usually not approved. One advantage of using CEA to determine if a new technology or drug will be covered by insurance is that it may force inventors to focus on the costs of the new technology relative to the existing treatment method.

A number of industrialized nations use CEA as part of their process for determining if new technologies and pharmaceuticals will be covered by insurance. For example, Canada, Australia, and the Netherlands use CEA in deciding whether a new drug will be covered by insurance. New Zealand and the United Kingdom use it in making not just drug coverage decisions but whether new technologies will be covered as well.

An alternative to using CEA is simply to announce that access to cost-increasing new technologies will be rationed. Rationing makes most people extremely uneasy, and therefore it could pressure inventors to search for ways to reduce the costs of new technologies. Similarly, returning to the distinction between how prices are set in healthcare markets and in competitive markets, if Medicare and private health insurers were to use their market power to set reimbursement rates for new technologies, pressure would be on innovators to find production methods that reduce the costs of the new technologies.

Katherine Swartz

See also Competition in Healthcare; Cost-Benefit and Cost-Effectiveness Analyses; Cost Containment Strategies; Healthcare Markets; Healthcare Reform; Health Economics; Health Insurance; U.S. National Health Expenditures

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- Medicare Board of Trustees Report: <http://www.cms.hhs.gov/reportstrustfunds>

COST SHIFTING

Cost shifting exists when a hospital, physician group, or other provider raises prices to one set of buyers because it has lowered prices to some

other group. The term has also been applied to managed-care firms that are similarly said to have raised premiums to one set of purchasers because it had to lower premiums to some other set. Cost shifting is often confused with price discrimination. Health services providers commonly price discriminate; that is, they charge different prices to different payers. However, such differential pricing strategies are not evidence of cost shifting.

Overview

The term *cost shifting* has been commonly used in debates over healthcare reform. Some have argued, for example, that efforts to reduce Medicare expenditures by lowering payments to hospitals under its prospective payment system (PPS) or through the encouragement of managed-care plans may save money for the Medicare program, but it will increase the costs to private payers. This is said to occur because hospitals will simply raise their prices to private insurers to make up the difference for the money that is being lost from Medicare beneficiaries. Private insurers, facing higher hospital prices, will then tell employers that they have to raise health insurance premiums because they are being cost shifted against by hospitals.

Two policy prescriptions emerge from this argument. First, private insurers should support coverage for the uninsured; the costs of the subsidy will be less than they appear because the hidden cost shift will be eliminated. Second, it is sometimes argued that cost shifting requires the systemic reform of healthcare. Any piecemeal effort to control costs will ultimately be eroded by increases in costs to some other payer, with the result that costs are not controlled. While subsidizing care for the uninsured and reforming the healthcare system are important goals, however, cost shifting is unlikely to be a serious component of the rationale.

Simply charging one group a higher price than another does not constitute cost shifting. Firms in many industries routinely do this. For example, airlines routinely charge different prices to people on the same airplane. Movie theaters routinely charge different prices to adults and children. Restaurants and banks give senior citizen discounts. Hotels offer convention rates. This is known as price discrimination.

Cost shifting is different. Not only must the provider charge different prices to different payers, it must also raise prices to one group in response to lower prices from another group. To be able to do this, two things are critical. First, the provider must have market power (i.e., it must have the ability to set prices above costs). Second, and most importantly, the provider must not have already fully exercised its market power.

The first condition is straightforward. Suppose a hospital had no market power. When it attempted to raise its prices to a local preferred provider organization (PPO), the PPO would simply drop the hospital from its network and channel its subscribers to other nearby hospitals. Thus, if there is substantial hospital competition in the local market, a hospital is unable to shift its costs.

The second condition is somewhat more subtle. A profit-maximizing provider with market power takes advantage of its power. The hospital will charge Medicare according to the fixed payment schedule that the government has adopted. It sets the price to the PPO based on the marginal revenue and marginal costs of the PPO's patients. Note that the marginal cost of providing care to the PPO may not be simply the medical costs of providing the care. The true marginal costs may be the payment that Medicare would have paid for one of its patients.

Now suppose that the U.S. Congress changed the Medicare payment formula and lowered the prices it paid to hospitals. The profit-maximizing hospital cannot raise its price to the PPO and get any more money. If it could do so, it was not profit-maximizing to start with. What the economics imply is that the hospital will lower, not raise, its price to the PPO. The reason is that when Medicare lowers its price, the profit-maximizing hospital tries to shift some of its capacity away from the now less-profitable Medicare market and toward the PPO market. However, the only way it can get the PPO to use more hospital days is to lower its price. The effect of a reduction in Medicare prices is a reduction in the prices faced by private insurers. Similarly, if Medicare were to raise its payment levels, the hospital would raise its prices to private insurers. Thus, a profit-maximizing provider does not engage in cost shifting.

A non-profit-maximizing provider does not necessarily cost shift either. It all depends on the objectives of the nonprofit hospital or provider. If the

objectives are to provide care to a third group of patients, say, the indigent, then even this hospital will not cost shift. Instead, it will set its prices at the profit-maximizing level, and instead of giving the profits to the shareholders, it will use those profits to care for the indigent. If it did not set those same higher prices, it would be providing less indigent care than it could have. If this hospital were now faced with reductions in Medicare payment levels, it would do exactly what the profit-maximizing hospital did, accept the lower Medicare payments and shift capacity to the PPO. This allows it to continue to provide as much charity care as possible, given the new lower Medicare payment level. Thus, there is no cost shifting in this example either.

The only way in theory to obtain the cost shifting result is to have a hospital (or other provider) that has market power but that also “likes” insured patients in the special sense that it charges them less than it profitably could. In this sense, it has unexploited market power. Now, when Medicare reduces its payment level, the hospital finds that it has fewer revenues from Medicare with which to subsidize privately insured patients and is then forced to raise its price to them. This is cost shifting. Thus, the ability to cost shift happens when hospitals still have the ability to maximize the revenues from the remaining private payers.

Cost shifting occurs because there is a growing gap between the payments from government programs (Medicare and Medicaid) that pay only for the direct cost of care for patients in these programs and not for the full economic costs of care. Because of this, a shortfall is created and hospitals then shift the unreimbursed costs by charging a higher price to privately insured patients. In effect, cost shifting results in the privately insured patients subsidizing the cost of care for the publicly insured patients. Because of the need to cost shift, hospitals may work to reduce their costs; that can lead to greater efficiency or affect quality of care.

The ability to cost shift varies in different geographic regions based on the market power of the provider, the level of payment from the public payer (Medicare and Medicaid), and the level of uncompensated care. If cost shifting were not done, providers would not be able to maintain their physical plants and equipment.

Empirical Evidence

The empirical evidence with respect to cost shifting has been mixed. Much of the work simply misses the point because it seeks to show that different payers pay different prices for essentially the same services. This is true, but price discrimination is not cost shifting. Other work tries to use cross-sectional comparisons to test for the presence of cost shifting. This is difficult to achieve because cost shifting is a dynamic phenomenon.

There have been three studies that shed light on the presence and extent of cost shifting in health-care. Hadley, Zuckerman, and Iezzoni used a national sample of hospitals from 1987 to 1989 to examine the effects of financial pressure and competition on the change in hospital revenues, costs, and profitability. They found that hospitals with lower base-year profits increased costs less and increased their efficiency. With respect to cost shifting, the authors did not find any evidence that cost shifting strategies that might protect hospital revenues in the wake of financial pressure were successfully undertaken.

Dranove and White used 1983 and 1992 California hospital data to examine the effects of reductions in Medicaid and Medicare volume on changes in price-cost margins (net price minus average costs all divided by net price) of privately insured patients in Medicaid-dependent hospitals. The authors did not find any evidence that Medicaid-dependent hospitals raised their prices to private patients in response to Medicaid (or Medicare) cutbacks. If there was any change, hospitals likely lowered their prices. The researchers also found that service levels fell for Medicaid (and Medicare) patients relative to privately insured patients, and they fell by more in Medicaid-dependent hospitals.

Zwanziger, Melnick, and Bamezai used California hospital data from the same source over the full time period of 1983 to 1991 and reached decidedly different conclusions. They computed the average price per discharge for Medicare, Medicaid, and non-Medicare or -Medicaid (i.e., privately insured) patients. Controlling for average costs in a two-stage model, they found that lower Medicare and Medicaid prices were associated with higher private prices. A 1% point decrease in the Medicare average price was estimated to

increase private prices at nonprofit hospitals by 0.23% to 0.59%. The larger price increases were found in markets with less hospital competition. In addition, Zwanziger and associates also found evidence that for-profit-owned hospitals also engaged in cost shifting. Similar analysis by Zwanziger and Bamezai for 1993 to 2001 concluded that the cost shifting that occurred from 1997 to 2001 of Medicare and Medicaid to private payers was responsible for a 12.3% increase in private payers' prices.

It is difficult to reconcile the disparate studies. Both Dranove and White and Zwanziger and associates used the same data over essentially the same time period. Some of the differences undoubtedly have to do with Dranove and White's use of beginning and end-point observations in a change model while the latter used essentially a panel of hospitals. The studies used different methodologies. The former examined profit margins, and the latter, price per discharge (although not price per day, which may be less subject to endogenous changes in length of stay). The former looked at changes in Medicare and Medicaid volume, while the latter looked at average price changes directly. Both of the studies tried to account for service or cost differences, but did so in very different ways.

Future Implications

One must conclude that the empirical evidence is mixed and that more work reconciling existing approaches and using alternative data would be desirable. The empirical question is compounded by the variety of other factors that must be considered. What are the relevant prices? How are they to be measured, and to what extent do the inherent compromises in their construction inadvertently bias the findings? How does one account for volume, service, and quality changes that are almost certainly endogenous (arise from within the model)? How does one approximate the relevant marginal cost by payer group? And how does one address the extent of competition?

Finally, as Zwanziger and his associates ask, do we need a more sophisticated hospital (or provider) model that not only incorporates individual hospital elements but more adequately accounts for the market environment in which providers

operate? Such models may more explicitly incorporate both price and quality competition and account for the roles of private and public-sector payment systems in driving providers individually and as a group toward one or another type of competition.

Michael A. Morrissey

See also Competition in Healthcare; Cost of Healthcare; Health Economics; Health Insurance; Hospitals; Medicaid; Medicare; Safety Net

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- America's Health Insurance Plans (AHIP):
<http://www.ahip.org>
- Healthcare Financial Management Association (HFMA):
<http://www.hfma.org>

CREDENTIALING

Credentialing is the process of assessing and confirming the qualifications of a licensed, registered, or certified healthcare professional. The main goal of the credentialing process is to ensure that health professionals such as physicians, dentists, registered nurses, and others are skilled and

knowledgeable about the current best practices of appropriate and effective care. To be responsible to the public and to meet legal obligations, health-care organizations must verify the competency of their staff members. Credentialing should be conducted by an independent third party to ensure the accuracy of the information obtained on the staff members. Some of the elements that are normally verified in the credentialing process include the individual's current licensure; relevant education, training, or experience; current competence; and health fitness or the ability to perform the required tasks. Requirements of credentialing, however, vary depending on specialty or area of practice. For example, an internship or residency may not be deemed necessary to ensure that a laboratory technician has the appropriate knowledge and experience to perform his or her job; surgeons, on the other hand, are required to complete lengthy and ongoing training activities.

Background

The general public's knowledge about the importance of credentialing has grown over the years. In the past, a large variation existed in what health practitioners learned in different specialty areas or schools, especially in the field of medicine. In the 19th century, the majority of medical schools in the United States were run with the focus on making a profit; they were not associated with a university or college, and curricula lacked extensive hands-on learning opportunities such as laboratory work or dissection. As a result, many poorly trained physicians entered the profession, patients suffered high mortality rates, and the public's faith in the medical field was low. Communities discovered that it was difficult to certify physicians because there were no established guidelines according to which what they had learned could be assessed.

In the early 1900s, a number of professional medical organizations advocated for the establishment of stricter, science-based, national requirements for medical education. As part of this effort, the American Medical Association (AMA) and the Council on Medical Education (CME) wanted an assessment of the current status of medical training. With funding from the Carnegie Foundation, Abraham Flexner (1866–1959), a professional

educator, was hired to conduct on-site visits to assess all medical schools in North America. Flexner compiled his findings in a landmark report, *Medical Education in the United States and Canada*, which was published in 1910. The Flexner Report, as it would become known, criticized the state of medical education and the training process, and Flexner made a number of recommendations. Specifically, he recommended that medical schools be integrated with colleges or universities, that the length of education be extended to at least 4 years, and that the curriculum content be agreed on and standardized by a reputable body. The report's findings led to significant changes in the nation's medical education, including more standardized curricula for medical students. Its findings also carried over to the areas of accreditation and credentialing.

Areas of Credentialing

Because medical knowledge is increasing daily, all health professionals need to keep abreast of new developments that affect their practices, and they must also make sure that they have adequately retained the knowledge they learned in the past, as demonstrated by the recertification requirements. All types of health professions require credentialing that matches the variety of specialties and subspecialties in medicine and healthcare. Professionals, including critical care nurses, managed-care physicians, and healthcare administrators, seek out credentialing from a specialized third-party agency. These agencies provide the professional with codes of conduct in addition to current information regarding their role or specialty, upholding the goals and furthering the mission of the credentialing body and the field. There are many credentialing organizations in healthcare, including the American Nurses Credentialing Center (ANCC), the National Commission for Health Education Credentialing (NCHEC), and the National Register of Health Service Providers in Psychology. Advances in technology have also allowed the growth of Web-based credentialing services.

Hospitals and clinics, like individual health professionals, can also be credentialed. Facilities want their staff to be credentialed and up-to-date because credentialed individuals tend to be more efficient

and productive as compared with noncredentialed staff members. Hospitals also want their staff to be credentialed to meet various legal and regulatory requirements.

Future Implications

The goal of credentialing is to ensure that patients receive high-quality and safe medical care by making sure every health professional providing care has appropriate certification and licensing. Credentialing not only ensures high standards of care and the increased quality of services but also enables patients to trust the health professionals and organizations from which they receive care. In the future, as the healthcare field continues to grow and incorporate a wider variety of workers, such as allied health professionals and complementary and alternative medicine professionals, the credentialing process will need to expand to address them.

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See also Health Workforce; Licensing; National Practitioner Data Bank (NPDB); Nurses; Pharmacy; Physicians; Quality of Healthcare; Regulation

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CRITICAL ACCESS HOSPITALS (CAHs)

Critical Access Hospitals (CAHs) are small, limited-service hospitals that act as safety net providers of essential healthcare services for rural Americans. These hospitals apply to become CAH-designated under a program established by the U.S. Congress through the Balanced Budget Act of 1997. Specifically, the program was established to address the closure of a large number of rural hospitals due to increasing financial stress. The 1980s saw a high hospital closure rate nationwide, with a considerably higher rate in rural areas. By 2000, many states had fewer than 90% of the rural hospitals they had in the 1990s. With the CAH program, closure rates have slowed significantly in rural areas, and many hospitals that had closed or reduced services have reopened.

The number of CAHs in the nation has increased from 41 in 1999 to 1,283 in 2007. To date, only New Jersey and Rhode Island have not applied for the program. The number of CAHs varies from year to year as some hospitals become ineligible for designation, either by losing rural status or through nonadherence to requirements. At the same time, new facilities are added. Currently, CAHs account for about 3% of the nation's total hospital beds and about 1% of Medicare's total payments for inpatient care.

Characteristics of the Program

The Medicare Rural Hospital Flexibility Grant Program, more commonly known as the Flex Program, established a new hospital category, the CAH, designed to provide financial stability to small, rural hospitals that were losing money after changes in the prospective payment system (PPS) implemented by Medicare in 1983. The program permits designated CAHs to function as limited-service facilities with flexible staffing and service requirements not permissible in larger hospitals. It also allows simplified billing methods and offers incentives to develop local, integrated health-delivery systems, including acute, primary, emergency, and long-term care. Although targeted at very small hospitals, the program covers healthcare

facilities and issues at the national, state, and local levels.

The Flex Program consists of two components: cost-based Medicare reimbursement for designated CAHs; and a state Flex Grant Program administered by the federal Office of Rural Health Policy (ORHP) to strengthen rural healthcare systems. The ORHP, which is within the Health Resources and Services Administration (HRSA) of the Department of Health and Human Services (HHS), manages the program nationally, making funds available to state Flex Programs and providing program oversight.

CAHs, which are designated to act as nuclei of organized, local systems of care in rural areas, work to encourage the growth of collaborative rural delivery systems across the continuum of care at the community level with appropriate external relationships for referral and support. In addition to designating and supporting the conversion of hospitals to CAHs, the statutory and regulatory provisions of the national program require states to develop and maintain a State Rural Health Plan, create a CAH network that is complementary to providing a wide range of services, fostering local Emergency Medical Services (EMS) linkages with CAH networks, supporting quality improvement initiatives, and evaluating their programs within the framework of national program goals.

The Flex Program contains explicit expectations and financial incentives up to \$700,000 to encourage CAHs to engage with their communities to access community health and health system needs, as well as to develop collaborative delivery systems. Most states are now engaged in quality and/or performance improvement activities with CAHs. Using local, state-to-state, regional, and national collaborations, states and CAHs are sharing and advancing knowledge on critical issues such as performance and quality of care improvement, health information technology development, and capital planning and acquisition. All states continue to streamline the CAH designation and conversion process, and they have now directed their efforts to providing direct assistance to support and improve CAH operations. Recent changes in the Medicare Modernization Act of 2003, such as increasing the acute-care hospital bed capacity of CAHs to 25 beds, may increase CAH conversion rates in some states. The emphasis on

infrastructure support for continued CAH operations is likely to continue for years to come as states continue to build their capacity for strengthening rural health infrastructure.

Requirements and Certification Process

Eligible rural hospitals must meet conditions of certification to obtain CHA designation from state and federal agencies. About two thirds of the state Flex Programs require that hospitals applying for CAH status conduct a community needs assessment and submit the results of that assessment with their CAH application. Specifically, to be included in the CAH program, hospitals must meet specific criteria. First, the hospital must be a rural public, nonprofit or for-profit hospital, or a hospital that was closed within the past 10 years, or a rural health clinic that was downsized from a hospital. The facility must be located in a state that has established a state plan with the federal Centers for Medicare and Medicaid Services (CMS) for the Medicare Rural Hospital Flexibility Program. Additionally, it must be located more than a 35-mile drive from any other hospital or CAH (in mountainous terrain or in areas with only secondary roads available, the mileage criterion is 15 miles), or it must be certified by the state in its plan as being a necessary provider of healthcare services to area residents. The hospital must provide 24-hour emergency care services 7 days a week, have a maximum of 25 acute-care and swing hospital beds, and provide no more than 15 hospital beds for acute, hospital-level inpatient care. Finally, to be considered for the CAH program, the hospital must provide an annual average length of stay of 96 hours per patient for acute-care patients. CAHs are required to be in compliance with the federal requirements set forth in the Medicare Conditions of Participation (CoP) to receive Medicare and Medicaid payment. Surveys are conducted to determine if the CAH is in compliance, and certification is accomplished through observations, interviews, and document and record reviews.

Federal law does not require all CAHs to be open 24 hours a day, 7 days a week. Twenty-four-hour nursing is mandatory when an inpatient is present in the hospital. It is also required for a physician, physician assistant, or nurse practitioner to

be available within 30 minutes. These exceptions allow considerable reductions in the cost of hospital operations. Medicare pays CAHs on a basis of 101% of inpatient reasonable costs, as well as most outpatient costs, while the state Medicaid program covers 100% of allowable inpatient and outpatient costs. Required services are inpatient and emergency care; laboratory and radiology services; and pharmacy and some ancillary and support services, which may be provided part-time or off site. For licensure, a CAH must be in compliance with Medicare standards of participation. Individual states can set their own criteria for levels of care that are higher than stipulated federal levels.

Future Implications

The CAH program helps fulfill a long-standing national need of ensuring hospital services for rural Americans. It facilitates the financial viability of small, low-volume rural hospitals and has nearly halted hospital closures. Being designated a CAH helps these facilities receive loans and funds from diverse sources, which in turn helps them modernize and expand the services they offer. The availability of additional CAH services has likely reduced the number of rural residents who bypass these facilities to seek care at other, more-distant hospitals. ORHP has funded studies of performance quality, best practices, and community impact of CAHs. The results of these studies will indicate how the CAH program may continue to improve the quality of healthcare in rural communities.

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See also Access to Healthcare; Geographic Barriers to Healthcare; Health Resources and Services Administration (HRSA); Hospital Closures; Hospitals; Medicare; Rural Health; Vulnerable Populations

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Centers for Medicare and Medicaid Services (CMS):

<http://www.cms.hhs.gov/center/cah.asp>

Office of Rural Health Policy (ORHP):

<http://ruralhealth.hrsa.gov>

Office of Rural Health Policy (ORHP), Rural Health

Research Gateway: <http://www.ruralhealthresearch.org>

Rural Health Resource Center (RHRC):

<http://www.ruralcenter.org>

CROSS-SECTIONAL STUDIES

Cross-sectional health studies present a snapshot of a disease, exposure, or health outcome at a specific point in time for a specific population. This snapshot often provides useful information for health services researchers and other health-care professionals. Researchers may glean useful information from conducting cross-sectional studies or by using information obtained from them. Often, the findings from cross-sectional studies help researchers identify which specific topic to pursue for more detailed investigation.

Nomenclature and Categorization

The purpose of many cross-sectional health studies is to describe the prevalence of a disease (e.g., the number of individuals with lung cancer in a community), the exposure to a particular risk factor (e.g., the number of individuals who smoke), or the

health outcome (e.g., changes in death, disease, disability, discomfort, or dissatisfaction) for a specific population; hence cross-sectional studies are also commonly referred to as *prevalence studies*. Cross-sectional or prevalence studies are also referred to as *surveys*, which emphasizes the fact that they are conducted at one time. Beyond this nomenclature is the categorization and classification of cross-sectional studies, which often differs by author. The various classification schemes are summarized below.

Most of the healthcare literature classifies cross-sectional studies as descriptive studies, along with case reports, case-series reports, and surveillance studies. Descriptive studies in general collect information from individuals (except ecological studies, which are sometimes placed in this category), and they attempt to describe the characteristics of people or a population.

Other classification schemes divide all studies into either experimental studies (where the randomized controlled clinical trial is the gold standard) or observational studies (which include cross-sectional, case-control, cohort, and ecological studies). Occasionally observational studies are subclassified into descriptive studies (i.e., case reports, case-series reports) and analytical studies (i.e., ecological, cross-sectional, case-control, and cohort studies)—where the criterion for classification is whether or not the information collected requires data analysis to develop conclusions.

Yet other classification schemes simply divide all studies into either cross-sectional studies or longitudinal studies—one point in time measurements (i.e., cross-sectional) versus repeated measures or time series measurements over a length of time (i.e., longitudinal, such as a cohort study). However, when serial cross-sectional studies of the same population are linked, such as the U.S. Census of Population for several different years, a modified form of longitudinal study is created (i.e., modified because the same people are not studied each year of the census due to migration, immigration, and births and deaths).

Uses of Cross-Sectional Studies

Cross-sectional studies are often used to determine the current health status of a population

(e.g., the total number of people with HIV/AIDS). They are often used to establish baseline information, which can be used for health services planning purposes and to make public policy decisions.

A large number of government agencies and private organizations conduct cross-sectional health studies. The federal agency that conducts the largest number of such studies is the National Center for Health Statistics (NCHS), which is part of the National Centers for Disease Control and Prevention (CDC). The NCHS conducts, for example, the National Ambulatory Medical Care Survey (NAMCS), the National Health Interview Survey (NHIS), the National Health and Nutrition Examination Survey (NHANES), the National Hospital Discharge Survey (NHDS), the National Home and Hospice Care Survey (NHHCS), and the National Nursing Home Survey (NNHS).

Health services researchers and public health workers often review information from cross-sectional studies to understand what risk factors are most common in a population for the purpose of choosing appropriate interventions. For example, when trying to prevent coronary artery disease in a population, if that population exercises and has little obesity but has a high prevalence of hypertension, an appropriate intervention may be establishing a public health program encouraging the population to lower stress and limit the use of salt. Similarly, cross-sectional studies can be used to estimate the hospital bed needs and clinic staff training needs for a population.

Clinicians also rely on information from prevalence or cross-sectional studies. Information from them is part of the diagnostic decision making in almost all the patient contacts a clinician makes. Prevalence studies help determine the likelihood that a patient with a given presentation may have a specific disease and hence the temporal order of the diagnostic work-up conducted by the clinician. For example, when carrying out an examination and tests to diagnose the cause of dyspnea (shortness of breath) in a normally healthy teenager, the clinician will consider bronchitis, pneumonia, and asthma before lung cancer, congestive heart failure, and sarcoid. Knowing the prevalence of these diseases among teenagers helps the clinician choose which diagnostic tests are needed for the dyspnic teenager.

Conducting and Analyzing Cross-Sectional Studies

Most descriptive studies address basic questions such as who, what, when, where, and why, with an implicit question of “so what?” In many cross-sectional health studies, researchers often start with a specific question (e.g., what is the relationship between smoking and lung cancer?) and then choose a population as well as which variables to study. The people in the study are chosen without regard to their exposure (e.g., smokers and nonsmokers). Cross-sectional studies collect exposure information either from all members of a population or from a sample of a population, at a single point in time. Typically, cross-sectional studies use a survey instrument or study questionnaire (either written or conducted by direct interview) and may include measurements and/or obtain biologic samples. Cross-sectional studies collect information on both the health outcome (e.g., number of individuals with lung cancer) and the exposure (e.g., smoker or nonsmoker) at the same time.

Cross-sectional studies should document and report in detail their study designs so other researchers can judge the quality of their results. The results of cross-sectional studies should provide the following: (a) a detailed description of the population studied, or if a sample of the population was used, a description of how the sampling was done, and if any weighting was used in drawing the sample; (b) when (i.e., date and time) and where (i.e., specific geographic location) the study was conducted; (c) how the comparison population was chosen, assuming the data are being analyzed for an association; (d) the source of the information used (i.e., questionnaire or biological sample—giving specific questions, or method of biological analysis) and how it was ascertained (i.e., home visit, worksite, or clinic), which includes how the exposures were ascertained (i.e., blood samples, work history, self-reporting by recall); (e) overall and specific response rates of people invited to participate in the study; (f) information on how the analysis of the study results were done; (g) what prevalence was found; (h) what associations were found; and (i) what qualification on inferences and associations need to be made.

General descriptive statistics using means and standard errors should be used in the analysis of

cross-sectional data. Often, the descriptive data from these studies are analyzed to express prevalence, such as the rate of a disease, or the proportion of the population at risk, or who had a certain exposure (the number with the disease, risk, or exposure divided by the number responding to the survey) in a population.

Besides being used for the presentation of prevalence and disease rates, cross-sectional studies are often used to develop inferences (i.e., inferring causation) or identify associations. The basic tool for analyzing cross-sectional data is a 2×2 table, where the four cells of the table are as follows: a = exposure factor and disease present, b = exposure factor and disease not present, c = no exposure factor, but disease present, and d = no exposure factor or disease present.

Often, as in the case of determining the source of a food-borne epidemic, several 2×2 tables are made to determine which food was most highly associated with the illness. From each table the prevalence odds ratios (POR), an estimate of the incident rate ratio, can be calculated. Using the cells of the table, the POR is calculated as ad/bc . The higher the POR, the stronger is the exposure or risk factor associated with the outcome or disease. In the case of the food-borne epidemic example, the highest PORs are inferred to be the foods most likely harboring the bacteria that caused the illness. To put it another way, the POR is the number of times having a specific exposure increases the risk of a disease above that of someone who has not been exposed to the risk factor. Chi-square analysis can then be used to determine if the difference between the exposure and the nonexposure is statistically significant.

Cross-sectional studies are sometimes repeated to estimate change over time in a population, but unlike cohort studies, the repeated study does not follow exactly the same population. This is called a *repeated measures design*, and generally repeated measures analysis of variance (ANOVA) is used to analyze data from this type of study.

Advantages and Limitations

Often, study methodologies are classified in terms of their ability to shed light on causality. Generally, cross-sectional studies are more useful in helping

identify possible causality than case studies, case-series, and ecological studies. However, evidence from case-control and cohort studies is considered stronger than that from cross-sectional studies, with randomized controlled clinical trials being the best or gold standard. Nevertheless, for determining the prevalence of a disease or exposure, cross-sectional studies remain an important tool for researchers.

Cross-sectional studies are useful to a wide variety of health professionals needing information for quick decisions on a low budget. Of all study methodologies, cross-sectional studies are among the most useful in acquiring information in a short time, and they are relatively inexpensive to conduct. Hence, cross-sectional studies are often referred to as “quick and dirty” assessments. They are often used to predict health service needs and the health impacts of disasters and disease outbreaks. Individuals are not deliberately exposed, treated, or left untreated, and therefore these studies rarely present ethical dilemmas. Cross-sectional studies are often used to garner the first understanding of a variety of exposures and risk factors. And they are often used to make hypotheses for further research, as seen with many large health surveys.

Although associations may be found between exposures or risk factors and health outcomes using cross-sectional studies, these studies fail in their ability to establish causality because they lack temporal information. Inferences may be made on possible causality, but they must be qualified because information gleaned from cross-sectional studies cannot clearly establish whether the outcome precedes the exposure or risk. For example, if obesity is found to be associated with lack of exercise in a cross-sectional study, it is unclear if obesity made it impossible or too painful to exercise or if obesity was caused by lack of exercise. This is an example of the antecedent-consequence bias common to all cross-sectional studies. Other studies might be developed to try to ascertain this temporal association (i.e., which comes first). However, such studies will never be as strong a support of causality as a prospective study. A clear association can be shown between exposure and a health outcome, but cross-sectional studies cannot establish causality because of loss of the temporal association between exposure (cause) and outcome

(effect), which at best relies on memory (which may be influenced by outcome).

Cross-sectional studies also have other limitations. For example, although a hospital cross-sectional, single-point-in-time survey may be used to estimate the needs of long-term care patients, the cross-sectional survey technique will likely underestimate the prevalence of short-term hospitalizations.

Another problem is using cross-sectional surveys to determine the effects of workers exposure. If a cross-sectional study is used in the workplace, workers are apt to be healthier, while others who are sick at home will not be included in the study. This is called the *healthy worker effect*. Therefore, other methodological tools may be better suited for measuring employee health.

Unless cross-sectional studies include very large populations, they are not suited for studying rare events. On the other hand, several researchers working on methodological issues in community-based health intervention trials conclude that serial cross-sectional studies, using repeated measures analysis, may be an optimal study methodology for health services research and other health research that proposes to affect the health of an entire population.

Capri Mara Fillmore

See also Epidemiology; Health Surveys; Measurement in Health Services Research; National Center for Health Statistics (NCHS); Randomized Controlled Trials (RCTs)

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 National Center for Health Statistics (NCHS): <http://www.cdc.gov/nchs>
 Society for Epidemiologic Research (SER): <http://www.epiresearch.org>

CROWD-OUT

The concept of crowd-out in the case of Medicaid and the State Children's Health Insurance Program (SCHIP) refers to the substitution of public for private health insurance coverage. This substitution is an important public policy concern because it may create unintended perverse incentives. Crowd-out may result from employers no longer offering health insurance once the public insurance expansion is implemented, from employees declining offered coverage because they opt for public coverage for which they are newly eligible, or from workers who are more inclined to take jobs with companies that do not offer health insurance coverage because they can take advantage of the publicly available alternative.

Background

A number of economic studies have investigated crowd-out in various public programs. Studies have examined crowd-out associated with the expansion of the Medicaid program in the late 1980s and early 1990s, in various state-initiated health insurance programs and in the State Children's Health Insurance Program (SCHIP), which was enacted in 1997 and initially authorized for a 10-year period. The public policy debate on whether the SCHIP should be reauthorized in 2007 focused national attention on the issue of crowd-out.

There have been many carefully conducted studies of crowd-out. In some cases, the studies defined crowd-out in different ways, reflecting both the various perspectives of the researchers conducting them and the various databases they used. Few studies have sought to identify the mechanism through which crowd-out is operating. As a result, the estimates on the extent of crowd-out can vary greatly across studies. Some studies suggest that it accounts for a very small percentage of changes in a population's health insurance coverage, while other studies put the figure as high as 60%, depending on the public program. The 2007 U.S. Congressional Budget Office's (CBO's) study of the SCHIP estimated the extent of crowd-out at 25% to 50%. In other words, for every 100 children who enrolled as a result of the program, there was a corresponding reduction in private health insurance coverage of between 25 and 50 children.

Policy Issues

For many state and national policymakers, one of the most challenging aspects of creating or expanding public insurance programs is how to provide a public health insurance option to individuals who are truly in need without distorting private behavior (crowd-out). On one hand, their goal is to increase the number of individuals covered by health insurance. On the other hand, they do not want to waste scarce public money, which merely shifts the source of funding from private to public insurance and does not result in improved access to healthcare or health status. An additional concern is that when healthy individuals shift from private to public insurance, those remaining with private insurance may be adversely affected. Risk may have to be spread over a smaller group and may trigger higher premiums.

Several factors appear to increase the likelihood of crowd-out. Expanding the eligibility of public programs to include higher income levels increases the potential for crowd-out because many individuals and families with higher incomes have private health insurance. Another factor is family eligibility: Parents are much more likely to enroll their children in a public program if they can also join it.

State public programs currently use a number of strategies to discourage crowd-out. They have

established eligibility restrictions based on current insurance states; imposed cost-sharing requirements such as monthly premiums, copayments and deductibles, and annual enrollment fees; and required a waiting period before allowing individuals to enroll in public programs.

States have also encouraged employers to begin and to continue offering health insurance to their workers' states by (a) reimbursing employers for their purchase of employer-sponsored coverage, (b) establishing purchasing cooperatives for small employers, and (c) establishing employer tax credit.

Future Implications

Much more research is needed to understand better the mechanisms, the extent, and the health impact of crowd-out. It is clear that crowd-out will occur with the creation of any new public insurance program or the expansion of an existing program. In the future, health economists will need to measure more precisely the extent of crowd-out, public health experts will need to identify the specific health impacts of crowd-out, and society will need to make a value judgment of whether and how much crowd-out in public programs is acceptable.

Anthony T. LoSasso

See also Access to Healthcare; Child Care; Health Economics; Health Insurance; Medicaid; State-Based Health Insurance Initiatives; State Children's Health Insurance Program (SCHIP); Uninsured Individuals

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CULTURAL COMPETENCY

Cultural competency is an evolving concept in health services research, with no universally agreed-on definition. Although not a new concept, the term first became widely used in public health and health services in the 1990s. It remains prominent in current considerations of addressing racial/ethnic disparities in health status and access to care. With a focus on the increasing population diversity of the United States and the persistence of racial/ethnic disparities in health, public health, medicine, nursing, social work, and other health science disciplines are adapting the concept to address current issues in working with diverse population groups. The inference is that there are identifiable organizational, community, and policy strategies that facilitate or impede the delivery of services to specific cultural groups or communities. The federal Health Resources and Services Administration's (HRSA) Bureau of Health Professions (BHP) Web site offers several inter-related definitions of cultural competency across various federal agencies. An element common to

all definitions is the ability to function effectively (in healthcare or other settings) with people who are culturally different. A less widely endorsed strategy as a condition to the above is some degree of self-reflection or awareness of one's (provider, researcher, policymaker) social position, relative power status, cultural values and practices, and even worldview. Many definitions of cultural competency across federal agencies and provider groups recognize culturally competent skills as encompassing the ability to incorporate culturally defined health beliefs and practices, language and communication patterns, and health-seeking behaviors of specific groups into practice, research, and policy.

In furthering the understanding of cultural competency, it is helpful to consider the meanings of the constituent terms, *culture* and *competency*. *Culture* refers to a unique configuration of behavioral norms, beliefs, and shared understanding of the world that guides everyday life and is common to a particular population subgroup. In every cultural subgroup, there are prescriptive means to transmit culture to new group members and intuitional practices to ensure its continuity and utility in attaining individual and collective goals in life. A common language or dialect is typical of many but not all cultural groups, and although shared historical, migratory, and ancestral roots are important markers in defining group membership, there is increasing diversity within groups due to globalization (social and economic forces' contribution to population migration and bringing cultural groups into regular contact with one another) and transnationalism (cultural groups maintaining ongoing contact with the homeland of origin through media, commerce, and transportation systems). All cultural groups, (including dominant Western White groups), possess locally adapted patterns or codes of conduct or performances of daily life that are unapparent to casual observers or outsiders, making it inappropriate for practitioners or researchers to impose rigid interpretations or categorization of beliefs and behaviors on any one group. Importantly, culture provides a lens for group members to interpret illness symptoms and engage in preventive and health-seeking behaviors. *Competency*, an ill-defined term in the human

performance literature, implies skills or abilities to perform role requirements in a specific context. Burgoyne refers to "being competent" as meeting the job demands, while "possessing competencies" means having the knowledge, skills, and attitudes to perform the job. Typical applications of the concept may be found in health services delivery, community, intervention development and evaluation, provider education, and studies of patient-consumer experiences with services.

However, there is a continuum of activities beyond the provision of healthcare services where cultural competency is concerned. In addition to healthcare services, the loci of concerns include research (including needs assessment, program planning and evaluation, and health services research) and policy development. While population diversity has implications for all these activities, health services research can be most useful in identifying how personal healthcare services, population-based interventions, and public health policies are affecting the health status of population subgroups and their access to care. For example, discrepancies between population groups in receipt of recommended preventive services can be examined in terms of provider, patient, and community characteristics as well as outcomes of population-based health education and outreach, and policy initiatives. Examples of how cultural competency can be addressed across a range of public health activities, including the role of health services research, are provided in Table 1. Here, cultural competency is broken down into the related concepts: cultural sensitivity, cultural proficiency, and cultural humility.

In Table 1, "Healthcare Services" refers to clinical interventions with individuals and families in ambulatory care settings such as outpatient clinics, physician's offices, and community health centers. "Community Level Interventions" refers to health promotion practices in community settings such as churches, schools, and community-based organizations. "Health Services Research" refers to scientific inquiry designed to capture trends in healthcare services access and use, identify causal and contributing factors to access and use, and evaluate the effectiveness of clinical and community-level interventions. "Public Health Policy" refers

to the function of ensuring access to clinical and community-level services through policy initiatives, particularly for vulnerable populations. Public health policy can also address environmental conditions (air and water quality, community safety, affordable and safe housing) that foster healthful living.

Cultural Sensitivity

In terms of the range of cultural competency approaches, cultural sensitivity is perhaps the normative or most prevalent approach. It is concerned with an awareness of cultural differences between the providers of services, the culture of the supporting institution (clinic or organizational setting), and cultures of consumers or service recipients. Awareness may not necessarily lead to effective interventions, but it is a first step in recognizing potential limitations of the manner in which care is delivered and how cultural differences can translate into a “barrier” that impedes the use of health services or ability of consumers to adhere to recommendations for personal health improvement. The same can be said for awareness in community-level interventions, with little or no community control over the intervention. Health services research in this phase of cultural competency is mostly descriptive, and data and methods are not designed to capture complex cultural factors such as acculturative processes, cultural resources, beliefs, and practices. Likewise, policies are not tailored for specific subgroups and have little meaningful input of affected communities or subgroups.

Cultural Proficiency

Although no one can be truly “culturally proficient” in a culture outside one’s own, this concept refers to actively valuing and embracing cultural differences such that ongoing efforts are made to enhance the understanding of cultures encountered in practice. In healthcare services as well as in community-level interventions, the concept of community-oriented primary care is relevant here. This means that the organization or program has means to assess the health-related beliefs and

practices of the populations of interest and identify cultural and community resources (ethnic grocery stores and indigenous support groups) that can be used to complement services. At the community level, interventions are tailored to reflect local culture, often deploying cultural symbols of strength and persistence in the face of adversity (e.g., Taino petroglyphs or other symbols of ancestral heritage). Here linguistic competence is of utmost importance, and so personnel are proficient in the language. Hours and locations of services take into account how time and space are structured in the community (e.g., shift hours, safety and convenience of locations). Health services research includes cultural variables such as acculturative status, health beliefs and practices, identification of ethnic and cultural subgroups (e.g., Puerto Rican and Mexican, not just Hispanic), and characteristic of services and programs that reflect cultural competency (board members and staff reflect community of interest, and linguistic competence). Research results are shared with the community for feedback and for quality improvement. The effect of policies on access and use of healthcare as well as services effectiveness is an important role of health services research. Policies are developed with some input from cultural groups affected by the issues, and such input is facilitated by removal of language barriers to understanding and discussion (e.g., printed materials in native languages).

Cultural Humility

Cultural humility can be viewed as the highest level of attainment of cultural skills because it not only builds on cultural proficiency but also focuses on self-reflection, a critical skill in cross-cultural work, and the consequent awareness of power differences between practitioners, researchers, policymakers, and the community of interest. Moreover, there is a commitment to address these power differences across the spectrum of public health modalities. Cultural humility recognizes the privileged status and social positions that practitioners, researchers, and policymakers occupy, regardless of their own ancestral heritage. In practice, it actively seeks to understand and appreciate the local historical and social

Table 1 Cultural Competency Approaches by Public Health Modality

<i>Cultural Competency Approaches</i>	<i>Public Health Modality</i>			
	<i>Healthcare Services</i>	<i>Community-Level Interventions</i>	<i>Health Services Research</i>	<i>Public Health Policy</i>
Locus of Change or Interest	Delivering services to individuals and family members	Delivering interventions to populations, social networks and subgroups, and community-based organizations	Describing or analyzing trends in access to healthcare and services utilization	Ensuring access to services through policy initiatives
Cultural Sensitivity	Awareness of cultural differences between providers and service recipients	Awareness of cultural differences between those designing or funding the intervention and those implementing and receiving the intervention	Presenting results with awareness of the major cultural subgroups in the study	Developing policies with awareness of the cultural differences in the population
Cultural Proficiency	Valuing cultural differences; having knowledge of group-level cultural practices while acknowledging individual differences; linguistic proficiency evident in health education materials and written policies; professional and organizational development encouraged; recruitment of staff reflecting community composition	Valuing cultural differences; tailoring interventions to local cultural practices and using indigenous institutions and personnel for delivery of services; linguistic proficiency evident in health education materials and written policies	Valuing cultural differences; collaborative enquiry with members of population subgroups affected by the health issue(s) under consideration; linguistic proficiency evident in research instruments and recruitment of participants	Valuing cultural differences in appreciating how policies may differentially affect cultural subgroups; seeking input from the cultural groups most affected by the health issue(s) under consideration; linguistic proficiency evident
Cultural Humility	Awareness of power issues in delivery of care; taking action to reduce social distancing and encourage participation in care; encouraging culturally appropriate self-care and use of community and cultural resources; professional and organizational development required	Awareness of power issues; inclusion of community as an equal partner in the intervention, sharing of intervention fiscal resources; conducting training and skill building for interventions; learning and appreciating the social-historical context of community; fostering cultural revitalization; addressing the broader social determinants that affect health	Awareness of power issues; coproduction of knowledge with community members, sharing research resources; building community capacity for research; fostering cultural revitalization; using research results to foster change	Awareness of power issues; actively fostering inclusion of youth and community members in policy changes

context or worldview of communities of interest. One of the hallmarks of cultural humility is meaningful inclusion of cultural groups affected by the issue. In healthcare and community interventions, this means bringing local cultural resources into partnerships, a fair distribution of fiscal and other resources, shared decision-making about services, and conducting training and fostering community capacity for taking more initiative and control of intervention development and research. Services research employs principles of collaborative inquiry such as in community-based participatory research (CBPR). As indicated in the literature, this means community involvement in all phases of the research process from inquiry questions and instruments to data analysis, interpretations, and actions that follow from the research findings. Such processes can improve the utility of research efforts because new understandings can emerge from the coconstruction of knowledge from joint community and academic partnerships. This is particularly important in services research, where much evidence-based research is lacking that can inform future policies and practice. In policy as in services research, youth (high school and college students) can be actively involved in the processes with mentoring so that they are encouraged to consider careers in the health sciences, perhaps services research in the future. These efforts actively seek out advocacy groups (through community organizations) and support pipeline programs (for enhancing minority enrollment in health professions) for including in the research and policy processes. Last, cultural humility approaches can enhance cultural revitalization through honoring and celebrating local culture and ensuring inclusion of cultural elements in health services, health promotion messages, and practices and local health policy processes. Finally, cultural humility and participatory practices in research can also identify the small-scale culturally sensitive interventions that are often managed by indigenous groups (not outside “experts”) and investigate the mechanisms by which these unique local interventions produce outcomes in specific groups under specific conditions. These culturally sensitive interventions are often excluded from research that seeks to identify empirically supported interventions.

Limitations of Culturally Competency Approaches

Because cultural competency has not been well defined or operationalized, it has been challenging to evaluate its effectiveness. It is important to keep in mind that cultural competency is also value-based, and as such it is significant in its own right in the absence of evidence. Additionally, cultural competency in and of itself cannot address all the social determinants of health that exert influence from the broader social structure that limits opportunities for equality and health in vulnerable populations. Nevertheless, there are calls for a research agenda to critically examine the role of the cultural factors identified above in healthcare delivery systems. The evidence to date shows promise for culturally congruent services (e.g., services that take into account cultural strengths, local resources, and way of life as well as population risk and protective factors). Health services research can play a vital role through the use of mixed methods (qualitative and quantitative) that identify and measure content of services, preferences and practices of consumers, and policies. The impact of services and policies as well as the processes that foster cultural competence need to be captured with data. More specifically, identifying the conditions under which certain cultural competency approaches contribute to improved health outcomes are of great interest. To the extent that research endeavors can incorporate community-based participatory research principals and practices (itself an exercise in cultural competency), the knowledge gleaned from such research can be more useful and can potentially contribute to informing the evidence for cultural competency for practice and policy.

Michele A. Kelley

See also Access to Healthcare; Community-Based Participatory Research (CBPR); Ethnic and Racial Barriers to Healthcare; Health Disparities; Health Resources and Services Administration (HRSA); National Healthcare Disparities Report (NHDR); Vulnerable Populations

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Culyer earned a bachelor's degree in economics from Exeter University in 1964 and received an honorary doctorate degree in economics from the Stockholm School of Economics in 1999. In 1964, he was awarded the Exeter University Leo T. Little Prize for economics, and he received a Fulbright Travel Scholarship to study and work as a teaching assistant at the University of California at Los Angeles in 1964–1965.

During his expansive career, Culyer has held academic positions in both England and Canada and has assumed administrative academic roles at the University of York. In addition, he has held visiting professor positions in Australia, Germany, and New Zealand. His editorial contributions have included being a founding coeditor of the *Journal of Health Economics*, editor of *Nuffield/York Portfolios*, advisory editor of *Social Science and Medicine*, and member of the editorial boards of numerous journals such as *The Economic Review*, *Journal of Medical Ethics*, the *British Medical Journal*, and *Clinical Effectiveness in Nursing*. He has served the health economics community extensively through his involvement in a variety of professional groups, including the Health Economists' Study Group, the Scientific Committee of the International Institute of Public Finance, the Canadian Institute of Advanced Research, and the Canadian Health Services Research Foundation (CHSRF). He has acted as an advisor, committee member, or chair for many groups, including health authorities, government agencies (in particular the United Kingdom's National Health Service [NHS]), and commissions and advisory groups for research and development. He also served as

vice-chair of the United Kingdom's National Institute for Clinical Excellence (NICE), an organization that provides national guidance on promoting good health and preventing and treating ill health in England and Wales.

Culyer has published over 200 articles, is a contributor to 28 books, and has authored or coauthored more than 35 monographs or discussion papers. His work is cited extensively. He has written on a variety of health-related topics, with many focusing on public policy and issues of efficiency, effectiveness, and equity. He is also the author of *Supporting Research and Development in the NHS* (1994), which is commonly known as the Culyer Report.

Gregory S. Finlayson

See also Canadian Health Services Research Foundation (CHSRF); Equity, Efficiency, and Effectiveness in Healthcare; Health Economics; Health Services Research in Canada; Health Services Research in the United Kingdom; Public Policy; United Kingdom's National Health Service (NHS); United Kingdom's National Institute for Health and Clinical Excellence (NICE)

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- Tony Culyer's Web Page: <http://www-users.york.ac.uk/~ajc17>

CURRENT PROCEDURAL TERMINOLOGY (CPT)

Current Procedural Terminology (CPT) is a code set that includes an array of medical, surgical, and diagnostic services tied to the financial reimbursement of physicians and healthcare services. The American Medical Association (AMA) maintains the CPT, and it is regarded as the standard for the accurate communication of medical information and procedures among physicians, government, third-party payers, and peer-review organizations.

Overview

Procedural coding by physicians has evolved from a rudimentary classification system used mostly for research purposes to a dynamic tool that reflects the rapid advancements in healthcare. The first *Physician's Current Procedural Terminology* was published by the AMA in 1966, and it was periodically revised until the fourth edition, which was published in 1977 as *CPT-4, Current Procedural Terminology—4th Edition*. Since then, the basic format has been retained, and all subsequent printings of CPT use the CPT-4 design. The revised *Current Procedure Terminology* is published annually, and the new revision takes effect each January 1. The AMA owns and develops CPT-4, and attempts by others to develop a medical procedural coding and medical nomenclature system have not been as widely recognized.

The acceptance of CPT-4 was enhanced in 1983, when the U.S. Department of Health and Human Services (HHS) signed a contract with the AMA designating CPT-4 as the standard coding system for describing physicians' and other healthcare providers' services for Medicare and Medicaid. The Resource Based Relative Value Scale (RBRVS) is based on the CPT-4 coding. The Resource Relative Value Scale is a system used to determine physician reimbursement, and numerical relative values are assigned to each CPT code. This value is multiplied by a dollar conversion factor, updated yearly by the Centers for Medicare and Medicaid Services (CMS), to determine payment levels for physician and other healthcare services. Third-party insurance companies and others have adopted

the same method of payment as the CMS based on CPT-4 coding.

The AMA/CPT Editorial Panel maintains, updates, modifies, and revises CPT-4. The AMA/CPT Editorial Panel is composed of 19 members selected by the AMA for 4- or 8-year terms. There are 13 physicians who represent selected medical and surgical specialties, in addition to a chair and vice-chair. The CMS, third-party medical insurance carriers, nonphysician providers, and the American Health Information Management Association (AHIMA) each have one member on the panel. The AMA/CPT Advisory Committee and AMA Health Care Professionals Advisory Committee also provide input into the AMA/CPT Editorial Panel. Additionally, there are 91 medical and surgical societies and 17 healthcare professional society representatives selected by the AMA for participation.

Code Categories

The CPT-4 publication divides physician services into three categories. Category I codes are based on procedures consistent with contemporary medical practice performed by many physicians in clinical practice. Category I code criteria include approval by the Food and Drug Administration (FDA) of any drug or device; the service being a distinct procedure and/or service performed by many physicians and/or practitioners; the clinical efficacy of the service and/or procedure being well established in peer-reviewed literature; the service and/or procedure being neither a fragmentation of an existing procedure or service nor currently reportable by one or more existing codes; and the suggested service and/or procedure being not a means to report extraordinary circumstances related to the performance of a service and/or procedure already having a specific CPT code. The CPT-4 coding system assigns a five-digit number to each code in Category I.

Category II codes are supplemental codes used for tracking performance measures. These codes are used to facilitate the collection of data on quality of care by coding services and/or tests that support performance measures contributing to good patient care. These four-digit codes are followed by

a capitalized letter *F* (e.g., discussion of osteoporosis prevention 4019F) and have no relative values assigned to them. CMS is presently conducting a pilot study based on the Category II codes called pay-for-performance—that is, using a reimbursement scheme based on performance measures.

Category III codes are temporary tracking codes assigned for new or emerging services and/or procedures to facilitate data collection and assessment. The criteria for Category III codes require a protocol for the study of procedures being performed, support from specialists who would use the procedure, availability of peer-reviewed literature, and a description of current clinical trials outlining the procedure's efficacy. There are no relative value units assigned to Category III codes. Category III codes are identified by four digits and followed by a capitalized letter *T* (e.g., 0052T). These codes are archived after 5 years unless the codes are promoted to a Category I code or there is a demonstrated need for further study.

Code Requests

Requests for a new code or the revision to an existing code can be submitted by anyone, and an application form can be obtained from the AMA Web site. Code requests submitted are reviewed by the AMA Editorial Research and Development Department staff. These requests are then sent to selected members of the CPT Advisory Committee for proper code placement, comment, and approval. The responses from members of the CPT Advisory Committee and others are evaluated by the AMA/CPT Editorial Panel. Sponsoring societies or individuals may request to appear before the AMA/CPT Editorial Panel during the CPT code consideration. The AMA/CPT Editorial Panel members then vote by secret ballot. The decisions of the editorial panel may be appealed prior to the completion of the yearly CPT-4 update.

Future Implications

The CPT coding system continues to evolve, and it is updated on a regular basis by the AMA in response to changing demands. It is likely that the CPT will continue to play an important role in the

future for financial, administrative, and research purposes.

Blair C. Filler

See also Diagnosis Related Groups (DRGs); Healthcare Financial Management; International Classification of Diseases (ICD); Medicare Payment Advisory Commission (MedPAC); Pay-for-Performance; Payment Mechanisms; Prospective Payment; Resource-Based Relative Value Scale (RBRVS)

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DATA PRIVACY

Data privacy is an abstract term that, in health-care, refers to the delicate relationship among the legal rights of a person, the growing global demand for information, and the technology used in the collection, sharing, and use of data. The word *privacy* invokes thoughts of freedom from unwanted access to one's health-related information as guaranteed by federal and state laws; it is also used with or in place of the term *confidentiality* in health-care. Confidentiality refers to the right of a person to expect his or her health-related information not to be accessed without his or her permission except what is required for his or her medical care and as allowed by the laws of the land.

Laws and Rules

A recent important rule is the Privacy Rule that was issued by the U.S. Department of Health and Human Services (HHS) in 2002 with a compliance date of April 14, 2003, under the mandate of the Health Insurance Portability and Accountability Act of 1996 (HIPAA). The Privacy Rule provides standards to protect individually identifiable health information. However, the rule only sets conditions for use and disclosure of the data by health-care plans, health-care providers, and health-care clearinghouses. The rule still allows disclosure of an individual's health-related information under certain public health and legal instances.

State law can prevail when it is more stringent than the federal HIPAA Privacy Rule. These state laws vary in the protection they offer and generally pertain to the privacy protection of genetic data. Laws, especially the Privacy Rule, limit the disclosure to the minimum necessary. *Minimum necessary* restricts disclosure or use to the minimum required to accomplish an individual's healthcare or legal task that enabled the release of the information.

Privacy and the Public's Health

The term *data privacy* becomes more obscure and indistinguishable from *confidentiality* as the global demand for information grows each year. As epidemics such as bird flu affect the global population, the terms *public health* and the *common good of the community* take on new connotations. Data privacy, or the anonymity of an individual with regard to his or her medical data, is weighed against the common good of the community, such as a city, then a state, and, eventually, a nation. Now our community is the world, and the data privacy of an individual must be weighed against the common good of the global community. Therefore, health-care providers are required by law to report certain diseases and other health conditions to specific health groups or registries. The data sent to the health groups, such as the state public health department, the Centers for Disease Control and Prevention (CDC), and cancer or other registries, are in one of three forms:

(1) individually identifiable data, (2) de-identifiable data, or (3) linkable data.

Forms of Data

Individually identifiable data consist of 18 items listed within the HIPAA Privacy Rule as items that can be used to identify an individual. The items are name, zip code with some reservations, dates (birth and death, without year) and the year when the person is 89 years of age or older, and telephone number. The list also includes facsimile number, e-mail address, social security number, medical numbers, and health plan beneficiary numbers. Identifiable data also cover Web universal resource locators (URLs), account numbers, certificate/license numbers, Internet protocol (IP) address, and vehicle identifiers. Also in the list as identifying data are device identifiers and serial numbers; biometric identifiers, full-face photos; and any other unique identifying number, characteristic, or code.

The de-identifiable data have most, if not all, of the 18 items removed so that the information cannot be traced back to an identifiable individual.

Linkable data have limited identifiable information and/or a code that can be used by the holder of the information to identify the individual whose data are being used or sent to the required agency or person.

Research Uses

Medical agencies are not the only ones that require healthcare data. Researchers also require data in their pursuit of new knowledge and advance cures. While researchers are not under the jurisdiction of HIPAA unless they are employees of a healthcare provider, healthcare plan, or healthcare clearinghouse; a provider themselves; or a business associate of one of the aforementioned groups and covered by contract or business agreement, they must follow the stipulations of an institutional review board (IRB) or a privacy board. IRBs are covered under Title 45 CFR (Code of Federal Regulations) Part 46, referred to as the Research Act of 1974. IRBs oversee the use of research data and the ethical and privacy problems that may arise from that use. A privacy board is an independent

review board founded to assist researchers in meeting HIPAA privacy requirements.

Pharmaceutical companies are also in the data and knowledge acquisition race. The data that are collected from the different registries, medical agencies, researchers, and others can and do end up in computer databases.

The technological advancements in the past 5 to 10 years allow researchers and others with personal computers and a connection to the Internet to perform data-mining procedures that were once the total domain of large research companies. Data mining is the process of searching large volumes of data using collective reasoning, associative rules, and other techniques to search for data patterns within multiple databases. Some programs will assist a researcher in data-mining efforts, so expertise with this technique is not needed to accomplish it.

Future Implications

The tentative relationship among the legal rights of a person; the growing global demand for data; and the technology used in the collection, use, and sharing of data has transformed the term *privacy* into *confidentiality* in the context of the world of healthcare. To keep the data confidential, healthcare providers must ensure that all interfaced systems are properly secured and must enforce the required level of protection against loss of individually identifiable data to unauthorized persons. Researchers and others who are not covered by HIPAA will need to rely on the IRBs, the privacy boards, the policies and procedures of the healthcare entity from which the data were received, and the researcher's own professional ethics. Technology will need to follow the guidelines set down in the HIPAA Security Rule and follow the principles of best security practices to lower the level of security risk to confidential data.

Greer W. P. Stevenson

See also Computers; Data Security; E-Health; Electronic Clinical Records; E-Prescribing; Healthcare Informatics Research; Health Insurance Portability and Accountability Act of 1996 (HIPAA); Technology Assessment

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- Healthcare Information and Management Systems Society (HIMSS): <http://www.himss.org>

DATA SECURITY

Data security refers to the requirement to ensure confidentiality, integrity, and availability of data. In security circles, confidentiality, integrity, and availability are called the *CIA triad* and are the bases for implementing data security. Confidentiality is present when disclosure of data to unauthorized personnel and/or systems is prevented from occurring. Data have integrity when they are complete, accurate, and reliable and when unauthorized alteration and/or destruction is prevented. Data security requires the active interventions of laws, management, people, and technology to ensure that the triad is active and working effectively.

Laws and Regulations

Numerous federal and common laws affect the way data are secured by individuals and within systems. A few of the federal laws that affect healthcare are the Computer Fraud and Abuse Act, the Computer Security Act of 1987, the Electronic Communications Privacy Act of 1986,

the Health Insurance Portability and Accountability Act of 1996 (HIPAA), the National Information Infrastructure Protection Act of 1996, and the Security and Freedom Through Encryption Act of 1999. In some instances where providers or hospitals offer financial plans, they are covered by the Sarbanes-Oxley Act of 2002. The main law that covers data security in the healthcare arena is HIPAA's Security Rule, Title 45 CFR (Code of Federal Regulations) Parts 160, 162, and 164, which had a compliance date of April 20, 2005.

The Security Rule applies only to covered entities—namely, healthcare providers, healthcare clearinghouses, and healthcare plans. The Security Rule requires that each covered entity institutes a security plan that meets or exceeds the security standards as set forth in the rule to protect the confidentiality, integrity, and availability of electronically protected health information and other information as set forth in the rule. The standards are divided into three categories: administrative, physical, and technical. Administrative safeguards require a risk analysis, contingency/disaster recovery plans, personnel security measures, sanctions, security policies and procedures, termination procedures, and training requirements. The physical safeguards cover media controls, physical access controls, workstation controls and procedures, and security awareness training. The technical safeguards pertain to system access controls, encryption, authorization controls, data authentication, and access authentication. These standards are either required or addressable. A required standard must be implemented. An addressable standard can be implemented as described in the rule, or the entity can justify why it chose another method to meet the standard.

The common laws that affect data security are numerous and usually are called into force through civil litigation when due diligence or due care is in question. Due diligence requires that an organization make and continue to make a valid effort to protect the confidentiality, integrity, and availability of the data. Due care requires the organization to act as any prudent and rational organization would when trying to protect the security of the data. One law that is not always enforced by court action is the law that grew from the norms, morals, and common laws of the land—ethics. Ethics

guides professionals, especially in healthcare, to do no harm and to protect the confidentiality of the patient or client.

Role of Management and Employees

Data security at a company or healthcare facility cannot be met through pain of penalty alone or with the adage “Do as I say, not as I do.” Security must be from the top down and may sometimes involve a modification of behavior within the entire organization. Management sets the tone and direction of security through policies, goals, and mission statements. The first step in building a data security program is to have top management state in writing the importance of security and determine what assets are to be protected and at what cost. It also directs and allocates resources to perform a risk analysis for determining what threats and hazards are being faced by which assets and how much it will cost to protect those assets from those threats and hazards. Management must then assume the risk or allocate resources to protect the identified assets to a level it deems appropriate. Management also is responsible for ensuring that all applicable policies and procedures are in place; even if it delegates the authority, it still maintains the responsibility.

Management cannot enforce data security in a vacuum. Employees must assist in data security or it will fail. Employees must ensure that only authorized individuals enter controlled areas where access to secure data and systems can be obtained. They also need to be observant enough to notice when someone is trying to peer over their shoulder to view the information being entered into the system. Employees must be careful of social engineering techniques and be aware enough to block the use of such security-breaking techniques. Social engineering is an act of undermining security by obtaining secure information through the use of deception. For instance, an employee may receive a telephone call from someone pretending to be the secretary of the chief executive officer (CEO) asking for secured information. The employee should realize that a secretary would not be asking for information that would not normally be released over the telephone or in person. Security awareness training can preclude or reduce the occurrence of social engineering.

Another concept related to security is called the “MOM” in security circles. It stands for means, opportunity, and motive. Workers have the means and opportunity to obtain secure data, and all they lack is the motive to cause a data security breach. But although outsiders or hackers may have the means and the motive, security controls will normally block their entry into the network. If the security controls do not block access to the network, the control might slow penetration into the network and give the network administrator a chance to notice and stop the violation. Hackers or crackers are individuals who penetrate secure networks for fun, profit, or fame or to cause havoc within the system. In the past, there was a difference in the meanings of hackers and crackers. Hackers broke into a system for fun and fame, while crackers did it for profit and to cause havoc.

With MOM and the tendency for employees to try to assist superiors over the telephone, a healthcare organization must ensure that its security policies and procedures are up-to-date and relevant. The organization must also use controls during hiring to ensure that the new recruits are trustworthy. Employees should be aware that they will face sanctions if they do not follow policies and procedures. Behavior modification can be achieved through education, observation by the management (seeing that controls apply to everyone no matter who they are), and awareness training.

Role of Technology

Technology is also necessary to ensure data security. Technical procedures and mechanisms must be put into place to control access to systems, networks, and facilities. Detection apparatuses can sense viruses and other malicious software and deny them access to vital systems and networks. Audit logs should be used to track authorized and unauthorized changes to data, but the logs need to be reviewed for inconsistency and possible security violations. Security patches and programs need to be tested before installation into a live system as the patches themselves can cause the introduction of errors or viruses. Security technology must be checked and updated regularly if security levels are to be maintained.

Data security can maintain the confidentiality, integrity, and availability of data only if the laws, management, people, and technology work together to ensure a stable but flexible security program.

Greer W. P. Stevenson

See also Computers; Data Privacy; E-Health; Electronic Clinical Records; E-Prescribing; Healthcare Informatics Research; Health Insurance Portability and Accountability Act of 1996 (HIPAA); Technology Assessment

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DATA SOURCES IN CONDUCTING HEALTH SERVICES RESEARCH

Health services research can be defined as the multidisciplinary field of investigation that studies how social factors, financing systems, organizational structures and processes, health technologies, and personal behaviors affect access to healthcare, the costs and quality of healthcare, and, ultimately, the outcomes of healthcare. Health services research often attempts to influence health policy and the practice of medicine through the analysis of large databases.

Although the list is not exhaustive, health services research generally addresses the following areas: (a) costs, cost-benefit, cost-effectiveness, and other economic aspects of healthcare; (b) patient and population health status/health disparities; (c) outcomes of healthcare technologies and interventions; (d) practice patterns and diffusion of technologies and interventions; (e) quality assurance programs; (f) clinical guidelines, standards, and criteria for healthcare; (g) the need and demand for health services; (h) utilization patterns of health services; (i) patient satisfaction with treatments, providers, and practice settings; (j) organization and delivery of healthcare; and (k) the various means of financing healthcare.

Many federal, state, and trade associations and professional societies actively collect and disseminate data that are used for health services research. At the federal government level, examples include the Agency for Healthcare Research and Quality (AHRQ), the Centers for Medicare and Medicaid Services (CMS), and the National Center for Health Statistics (NCHS). At the state government level, they include departments of public health, departments of health and family services, and health planning and development offices. Examples of trade associations and professional societies include the American Hospital Association (AHA), American Medical Association (AMA), and National Committee for Quality Assurance (NCQA).

Major Databases

To conduct health services research, a large number of publicly accessible databases are available. Below is a brief description of some of the major databases.

Minimum Data Set (MDS)

The Minimum Data Set (MDS) is a part of the federally mandated process for clinical assessment of all residents in Medicare- or Medicaid-certified nursing homes. This process provides a comprehensive assessment of each resident's functional capabilities and helps nursing home staff identify health problems. Resident assessment protocols (RAPs) are a part of this process and provide the foundation on which a resident's individual care

plan is formulated. MDS assessment forms are completed for all residents in certified nursing homes, regardless of the source of payment for the individual resident. The MDS is available from the CMS.

Medicare Current Beneficiary Survey (MCBS)

The Medicare Current Beneficiary Survey (MCBS) is a survey of a nationally representative sample of aged, disabled, and institutionalized Medicare beneficiaries. It is the only comprehensive source of information on the health status, healthcare use and expenditures, health insurance coverage, and socioeconomic and demographic characteristics of the entire spectrum of Medicare beneficiaries. Data from the MCBS are available from the CMS.

Online Survey, Certification, and Reporting (OSCAR)

The Online Survey, Certification, and Reporting (OSCAR) system is a compilation of all data elements collected by surveyors during the inspection conducted at nursing facilities for the purpose of certification for participation in the Medicare and Medicaid programs. It is the most comprehensive source of facility-level information on the operations, patient census, and regulatory compliance of nursing facilities. Data from the OSCAR system are available from the CMS.

Healthcare Cost Report Information System (HCRIS)

The Healthcare Cost Report Information System (HCRIS) contains audited Medicare provider cost reports submitted to the CMS. The HCRIS contains five different cost reports: (1) hospital reports, (2) hospice reports, (3) home health agency reports, (4) renal facility reports, and (5) skilled-nursing facility reports. The H and the Individual Facility Cost Report Information System are available from the CMS.

Area Resource File (ARF)

The Area Resource File (ARF) is a database containing more than 6,000 variables for each of

the nation's counties. It contains information on health facilities, health professionals, measures of resource scarcity, health status, economic activity, health training programs, and socioeconomic and environmental characteristics. ARF is a collection of data from various sources, including the AHA, AMA, and the NCHS. ARF is available from Quality Resource Systems, Inc.

American Hospital Association (AHA) Annual Survey

The AHA's Annual Survey collects information on numerous characteristics of hospitals and their patients. It collects data on the organizational structure, the facilities and services offered, utilization data, physician arrangements, managed-care relationships, and hospital expenses and staffing. The annual survey is the largest and most comprehensive source of information on the nation's hospitals, including the association's member and nonmember hospitals. Data from the annual survey are available from the AHA.

Healthcare Cost and Utilization Project (HCUP)

Healthcare Cost and Utilization Project (HCUP) databases bring together the data collection efforts of state data organizations, hospital associations, private data organizations, and the federal government to create a national information resource of patient-level healthcare data. HCUP databases include the Nationwide Inpatient Sample (NIS), the Kids' Inpatient Database (KID), the State Inpatient Databases (SID), the State Ambulatory Surgery Databases (SASD), and the State Emergency Department Databases (SEDD). Data from HCUP are available from the AHRQ.

National Health Interview Survey (NHIS)

The National Health Interview Survey (NHIS) is the principal source of information on the health of the civilian noninstitutionalized population of the United States. Conducted since 1960 by the NCHS, data from the NHIS are used to monitor national trends in illness and disability and to track progress toward achieving national health objectives. Its questions have remained fairly constant over time,

although new questions are periodically added. The NHIS is available from the NCHS.

National Hospital Ambulatory Medical Care Survey (NHAMCS)

The National Hospital Ambulatory Medical Care Survey (NHAMCS) is a data set on the utilization and provision of ambulatory-care services provided in hospital emergency and outpatient departments. Findings are based on a national sample of visits to the emergency departments and outpatient departments of general and short-stay hospitals, excluding federal, military, and Veterans Health Administration hospitals. The NHAMCS is available from the NCHS.

Surveillance, Epidemiology, and End Results (SEER) Program

The Surveillance, Epidemiology, and End Results (SEER) Program collects and publishes cancer incidence and survival data in the nation. It collects data from population-based cancer registries covering about 26% of the U.S. population. The SEER Program registries routinely collect data on patient demographics, primary tumor site, tumor morphology and stage of diagnosis, first course of treatment, and follow-up for vital status. It is the only comprehensive source of population-based information in the nation that includes stage of cancer at the time of diagnosis and patient survival data. Data from the SEER Program are available from the National Cancer Institute (NCI).

Healthcare Effectiveness Data and Information Set (HEDIS)

The Healthcare Effectiveness Data and Information Set (HEDIS) is a tool used by more than 90% of health plans in the nation to measure performance on important dimensions of care and service. In total, the HEDIS consists of 71 measures across eight domains of care. It is a set of standardized performance measures related to many significant public health issues, such as cancer, heart disease, smoking, asthma, and diabetes. The HEDIS also includes a standardized survey of consumers' experiences that evaluates a health plan's performance in areas such as customer

service, access to care, and claims processing. The HEDIS is available from the NCQA.

Limitations of Available Databases

While conducting research, many health services researchers often combine several databases. This can sometimes be problematic because data sets may be collected at different times using different definitions of variables. Some data sets may have few cases, and the small numbers may make it difficult to extrapolate to the population. Another major problem is missing data. Sensitive questions may have few responders. Finally, although some data sets are given to users for free, others can cost thousands of dollars to purchase.

Ethical Issues

When using databases, health services researchers may encounter ethical challenges that arise from the tension between protecting the individual's privacy and meeting societal needs for information. The most important features of U.S. federal regulations on the protection of human subjects are institutional review boards (IRBs) and informed consent from participants in research studies. Researchers need permission to use secondary data from IRBs.

An IRB is a group that has been formally designated to approve, monitor, and review medical and behavioral research involving humans with the aim of protecting the rights and welfare of the subjects. Furthermore, informed consent is required for any research that directly involves individuals and patients. The purpose of informed consent is to provide subjects information about the research, including its purpose, procedures, risks, and anticipated benefits. It also is the investigator's responsibility to protect the subjects' privacy when conducting research involving human subjects.

Keon-Hyung Lee and Thomas T. H. Wan

See also Agency for Healthcare Research and Quality (AHRQ); American Hospital Association (AHA); Centers for Medicare and Medicaid Services (CMS); Healthcare Cost and Utilization Project (HCUP); Healthcare Effectiveness Data and Information Set (HEDIS); Measurement in Health Services Research; National Center for Health Statistics (NCHS)

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- Centers for Medicare and Medicaid Services (CMS): <http://www.cms.hhs.gov>
- National Center for Health Statistics (NCHS): <http://www.cdc.gov/nchs>
- National Information Center on Health Services Research and Health Care Technology (NICHSR): <http://www.nlm.nih.gov/nichsr>

DAVIS, KAREN

Karen Davis is the president of the Commonwealth Fund, a large New York City-based, private foundation that promotes healthcare. Davis is a nationally recognized health economist, with an extensive background in health services research and public policy.

A native of Oklahoma, Davis was born in 1942. Davis earned a bachelor's degree (1965) and a doctoral degree in economics (1969) from Rice University in Houston, Texas. She started her career as an assistant professor of economics at

Rice University, teaching from 1968 to 1970. In 1970, she left the university and became a research associate at the Brookings Institution in Washington, D.C. In 1974-1975, while on leave from Brookings, she was a visiting lecturer on economics at Harvard University. She returned to the Brookings Institution as a senior fellow. In 1977, she was appointed deputy assistant secretary for planning and evaluation (health) in the Office of the Secretary of the U.S. Department of Health and Human Services (HHS). In 1980, she became the first woman to ever head a U.S. Public Health Service agency when she became the administrator of the Health Resources Administration. Davis served as the administrator until the end of the Carter administration in 1981. From 1981 to 1992, she was a professor at Johns Hopkins University. She served as chairman of the Department Health Policy and Management at the School of Hygiene and Public Health from 1983 to 1992. In 1992, she left the university to become the executive vice president of the Commonwealth Fund, and in 1995, she became its president.

Throughout her career, Davis has served as a member of numerous healthcare boards and committees. These include the Congressional Budget Office (CBO), Health Advisory Panel; National Academy of Sciences, Institute of Medicine (IOM); Board of Directors of the Geisinger Health System Foundation; Baxter-Allegiance Foundation Prize for Health Services Research Election Committee; Council on the Economic Impact of Health Care Reform; Health Care Executive Forum; President's Council, Health Policy Forum, United Hospital Fund; and Kaiser Commission on Medicaid and the Uninsured.

Davis has authored or coauthored six books, numerous reports, and more than 100 journal articles. Her most recent publications address issues such as access to healthcare, the healthcare problems experienced by the uninsured, various state and national healthcare reform efforts, and the overall performance of healthcare systems.

Davis has received numerous awards and honors for her work. She received the Picker Institute Annual Award for Excellence in Patient-Centered Care and, in 2006, the Academy Health Distinguished Investigator Award. She was made an Alpha Omega Alpha Honorary Member in 2001. She was awarded an honorary doctorate in

humane letters from Johns Hopkins University in 2001. She was given the Baxter-Allegiance Foundation Prize for Health Services Research in 2000. And she received the Rice University Distinguished Alumna Award in 1991.

Amie Lulinski Norris

See also Access to Healthcare; Brookings Institution; Commonwealth Fund; Health Economics; Health Insurance; National Health Insurance; Public Policy; Uninsured Individuals

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DAVIS, MICHAEL M.

Michael M. Davis (1879–1971) was a major figure in healthcare policy in the United States. Davis was a pioneer researcher in the economics, quality, and organization of medical care. During his career of more than 50 years, he held executive positions on the Committee on the Costs of Medical Care (CCMC), the Julius Rosenwald

Fund, the Committee for Research on Medical Economics, and the Committee for the Nation's Health.

Born in 1879 in New York City, Michael Davis earned a bachelor's degree (1900) and a doctoral degree (1906) in sociology from Columbia University. While working on his doctoral degree, Davis became interested in the social problems of New York's Lower East Side. In 1905, he had joined the staff of the People's Institute at Cooper Union. He remained at the institute for 5 years, working in social settlements, where he learned firsthand the many problems experienced by immigrants and the poor.

From 1910 to 1920, Davis was the director of the Boston Dispensary, where he investigated the organization, delivery, and financing of health services, a subject to which he was to devote his life. At the dispensary, Davis studied the management and structure of healthcare, its efficiency and evaluation methods, and the interrelations between health professionals and preventive and curative care. He also introduced the idea of a "pay clinic," where patients were charged a fee corresponding to the costs of the services rendered.

In the 1920s, Davis was instrumental in setting up the CCMC, and he served as a member of its executive committee. In 1928, he became the director of medical services at the Julius Rosenwald Fund in Chicago. His department promoted the concept of pay clinics and supported studies leading to the establishment of the Blue Cross system of prepayment of hospital costs.

From 1932 to 1936, Davis was a lecturer in sociology at the University of Chicago, where he was instrumental in establishing the first graduate program in hospital administration in the country, under the auspices of the Graduate School of Business. In 1934–1935, Davis assisted in drafting the Social Security Act.

With a grant from the Rosenwald Fund, Davis established the Committee for Research in Medical Economics in 1936. Under his leadership, the committee funded a wide variety of studies in medical economics. It also published the first journal, *Medical Care*, solely devoted to the economic and social aspects of health services. The journal was published from 1941 to 1944.

In 1945, Davis helped draft President Harry S. Truman's message advocating a national health

insurance program. And in 1946, Davis established and chaired the Committee on the Nation's Health to promote national health insurance. With the election of President Dwight D. Eisenhower in 1952, the prospects of national health insurance diminished, and the committee was eventually abolished in 1956.

Over his long career, Davis authored 12 books and more than 250 articles. Some of his most influential publications include *Dispensaries, Their Management and Development* (with Andrew R. Warner), *Immigrant Health and the Community*, *The Crisis in Hospital Finance and Other Studies in Hospital Economics* (with C. Rufus Rorem), *Public Medical Services*, *America Organizes Medicine*, *Medical Care for Tomorrow*, *America Challenges Medicine*, and "What Are We Heading for in Medical Care?"

Davis's many contributions were recognized by the American Sociological Association (ASA) and the American Public Health Association (APHA). The University of Chicago established a lecture series in his honor in 1963, which continues to the present. Davis gave the first lecture, titled "America Challenges Medicine."

Ross M. Mullner

See also Committee on the Costs of Medical Care (CCMC); Health Economics; Health Insurance; Health Services Research, Origins; Medical Sociology; National Health Insurance; Public Health; Rorem, C. Rufus

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DENTISTS AND DENTAL CARE

Dentistry is a branch of biomedical science addressing the prevention, diagnosis, and treatment of conditions, diseases, and disorders of the teeth, gums, jaws, oral cavity, and adjacent structures.

In most of the world, 4 years of undergraduate study and 4 years in a doctoral program are required to become a dentist. In the United States, a dentist is qualified to practice after graduating with a doctor of dental surgery or doctor of dental medicine degree. There are 56 dental schools in the United States and 10 in Canada.

The majority of practitioners are general dentists, who examine the oral cavity and diagnose and treat diseases, decay, and injuries within it. The American Dental Association (ADA) recognizes nine branches of dental specialization: (1) endodontics, which is root canal therapy, or removing the nerves of teeth; (2) oral and maxillofacial pathology, the detection and diagnosis of diseases

in the oral cavity; (3) oral and maxillofacial radiology, the radiologic interpretation of oral disease; (4) oral surgery, the treatment of oral diseases and abnormalities via surgery; (5) orthodontics, the treatment of abnormalities in tooth position and jaw relationships; (6) pedodontics, the provision of oral care to children; (7) periodontics, the treatment of gum disease; (8) prosthodontics, the creation of artificial teeth and other dental appliances; and (9) public health dentistry, the science of promoting dental health through organized public efforts.

There are other specialties as well, such as general-practice residency (hospital training), cosmetic dentistry, and geriatric dentistry (dental care for older adults).

Dentists often work with dental auxiliaries, including dental assistants (who pass instruments and retract tissues), dental hygienists (who specialize in preventive care, such as cleaning and scaling), and dental technicians (who fabricate dental appliances).

This entry briefly describes the historical development of dental treatment and then discusses the current problems for dentistry and the emerging trends and challenges that dentistry faces.

Historical Development

Historical records indicate that dental treatment existed in the Indus valley of Asia as early as 3300 BCE. In previous centuries, dentistry was not an independent profession and consisted primarily of tooth extractions, performed by everyone from general physicians to barbers.

The 17th-century French physician Pierre Fauchard is considered the father of modern dentistry, as he developed dental prostheses and dental fillings. Porcelain teeth were introduced in the 18th century, and the invention of Vulcanite rubber in the 19th century made dentures more affordable to larger numbers of people.

Nitrous oxide was introduced as an anesthetic in the 1830s. The first dental school, the Baltimore College of Dental Surgery, opened in 1840. Gold foil fillings were invented in 1855 by Robert Arthur. The first crowns were developed in 1880 by Cassius M. Richmond. Fluoridation of water, proven to prevent cavities, began in the 1930s. The

high-speed handpiece, which made dental treatment much less painful, was invented by John Borden in the 1940s.

Problems in Dentistry

There currently are approximately 199,000 dentists in the United States, and there has been no substantial change in the dentist-to-population ratio in the past three decades. However, approximately 35% of dentists are aged 50 years or older, and approximately 20% are older than 60. Although there is no shortage of dentists today, because of the aging dentist population, the number of dentists retiring is expected to exceed the number of new dentists starting in 2014.

There is a maldistribution of dentists in both the United States and Canada as dentists simply do not migrate to certain areas, according to the Academy of General Dentistry (AGD) Council on Dental Care. There also is a severe lack of dentists in rural areas; for example, California, an urban state, has 11.9 times the population of Mississippi, a rural state, but 22.9 times the number of dentists. There is one dentist for every 2,359 residents of rural South Dakota, compared with one for every 1,714 people nationally. The dentists who practice in those areas also tend to be older and close to retirement. There also is a nationwide shortage of dental hygienists.

Although American dental care is considered by some to be the best in the world, the cost of dental care is high and is accessible to, at most, only half of the population. Access to dental care is a serious problem in America today. The U.S. Surgeon General's 2000 report *Oral Health in America* reported that minority, economically disadvantaged, medically compromised, elderly, and rural persons suffered from a lack of oral healthcare. More than 100 million Americans have no dental insurance.

The federal Health Resources and Services Administration (HRSA) reports that 20% of the U.S. population resides in health professional shortage areas (HPSA). According to a Workforce Study by the ADA, 37 states report a lack of practicing dentists in one or more area of the state.

This lack of dental care has far-reaching educational, economic, and health applications. Oral

pain interferes with the daily activities of 4 to 5 million youngsters annually and is the leading cause of missed school days. The Surgeon General's report cited research showing that chronic oral infections can lead to heart and lung diseases, diabetes, stroke, premature births, and low-birth-weight infants.

Because Medicare does not pay for routine oral care, nearly a third of those over 65 years of age have untreated oral disease. More than 100 million Americans are without fluoridated water. Seniors living in rural areas are less likely to have dental insurance, less likely to visit the dentist, and more likely to be edentulous (without teeth) and to have poor dental health than their urban counterparts. With the number of seniors in the United States, currently about 35 million, expected to double by 2030, the problem of providing them with dental care will grow enormously.

Both the very young and the very old are the parts of the population most vulnerable to oral health problems, and they are the parts of the population most lacking oral healthcare.

The lack of access to care is a serious threat to the way dentistry currently is practiced. As the situation has worsened, state governments have stepped in. California and Minnesota has passed legislation allowing foreign dentists to be licensed in those states if they will treat the underserved. North Carolina provides Medicaid funds to pediatricians and nurse practitioners to conduct oral health screenings, apply fluoride varnish, and provide oral-care education to patients. In 19 states, dental auxiliaries have been granted the right to perform some procedures previously reserved for dentists.

If Medicare is altered to include oral care, it will mark perhaps the biggest change in dentistry of all, as the federal government will then be dealing directly with dentists' treatments and payments on a large scale for the first time.

Another threat to dentistry is deprofessionalization—the perception by the public and the public's representatives in government that oral healthcare is not a part of general healthcare.

That perception began in the 1960s, when the dental profession as a whole declined to participate in the Medicare system. It is reinforced today by the focus on dentistry as a business and on cosmetic dentistry in many practices. Cosmetic dentistry is a lucrative part of the profession, but the

emphasis on it confuses members of the public, linking the dentist more in their minds with the cosmetologist and the small-business entrepreneur than with the medical doctor. Such a link creates a risk of the dental profession becoming marginalized.

Still another threat to dentistry is that of the underfunding of public higher education, as many dental schools are part of public universities. After World War II and with the GI Bill, American public higher education was held up as the right of Americans. In the past 20 years, however, that view has shifted to one of higher education being a commodity that is the student's responsibility to fund, not the taxpayer's. Dental education is hit particularly hard by this change in public perception, because dental education is the most expensive of any discipline other than veterinary medicine.

Dentistry therefore runs the risk of becoming the exclusive purview of the well-to-do. If only those who already are financially secure can afford dental school, the lack of access to dental care by the underserved will only increase. Students are leaving dental school with an average debt of \$141,541, according to the ADA, and will make median annual earnings of \$129,920. That \$129,920 brings a good living, but business school or medical school can provide a graduate with an education leading to an even better living. Therefore, dentistry also is running the risk of losing the best and brightest students to other professions.

Another aspect of the crisis in dental education is the shortage in dental faculty. Three decades ago, a practicing dentist and a teaching dentist made approximately the same amount of money. Faculty salaries have not kept up with the rising salaries of practitioners, however, so there now are at least 250 vacant faculty positions around the country. Half the dental educators are over 50 years of age and are expected to retire in the next decade, making the faculty shortage even more acute.

This lack of faculty, along with aging dental school facilities requiring modernization, is expected to result in some older dental schools closing, a trend that has already begun. Some new schools are opening, but they are operating under a very different model. They often do not have a research mission like the older schools do; they charge at least \$50,000 per year in tuition, and that figure precludes them from doing much about diversity in their student population.

Hope for the Future

Yet there are positive signs on the horizon for dentistry as well. The way dentistry is taught and practiced is rapidly changing. As the solo practitioner has been replaced by group practices, and the treatment of existing dental disease has been replaced by preventive dentistry, dental school curricula have been changed as well. Discipline-based educational approaches formerly focused on surgical therapy performed by solo practitioners; now they focus on integrated preventive patient care measures and collegiality. Large lecture halls have been replaced by small-group practices within dental schools, in which students take a collaborative approach, perform Internet research, and work on patients earlier than ever.

Dental school curricula are increasingly focused on prevention, dental public health, research, community-oriented healthcare, behavioral science, cultural sensitivity, ethics, quality assurance, and practice management. In addition, many dental schools are sending students out to practice in community healthcare facilities in order to give them exposure to America's underserved populations.

American dental schools are seeing a generation of students who do not just want to make money but want to make a difference. Schools are educating more students who are interested in public health dentistry. Even those who are not willing to devote their entire career to public health dentistry are showing more interest in practicing in a community clinic a few days a week while they devote the bulk of their time to their private practices. While few young dentists are interested in becoming full-time faculty in dental schools, many are interested in giving back to the profession by teaching part-time. Dental schools are therefore creating new curricula in which a large number of part-time faculty are fulfilling the roles that full-time faculty did previously.

To bring awareness of the problems in dental education and the efforts to solve them to the public and the profession, "Dental Education: Our Legacy—Our Future," a national collaborative effort of partner organizations, has been created. It is underwritten by the American Dental Association Foundation with support from the ADA and is designed to help participating partner organizations, such as dental schools and dental societies,

raise more than \$500 million through 2014, to deal with issues such as faculty shortages, lack of diversity, aging physical and clinical facilities, lagging governmental support, and escalating costs.

The dental schools committed to research are seeking new knowledge vital not just to dentistry but also to medicine as a whole. For example, research on replicating or "cloning" teeth being undertaken at the University of Illinois at Chicago College of Dentistry will influence the replication of other body parts as well. Dentists, already familiar with making replacement body parts, are at the forefront of stem cell science at the University of Michigan.

There are programs in place to ameliorate faculty shortages. For example, the American Dental Education Association (ADEA) Academic Careers Network links potential faculty with open positions. The ADEA/American Association of Dental Research Academic Dental Careers Fellowship Program, supported by the American Dental Association Foundation, provides students who are interested in careers in academic dentistry with paid fellowships and other stipends. The federal HRSA Faculty Loan Repayment Program provides a financial incentive for health professionals from disadvantaged backgrounds to pursue academic careers. The ADA annually hosts a session for practitioners interested in learning about opportunities to join the faculty of dental schools.

There also are programs in place to increase the numbers of dentists who are willing to provide oral care to the underserved. The Robert Wood Johnson Foundation (RWJF) provides a "Pipeline, Profession, and Practice Community-Based Dental Education" grant to several dental schools to help prepare an oral healthcare workforce competent and committed to treating oral diseases in vulnerable populations. The W. K. Kellogg/ADEA Minority Dental Faculty Development Program provides grants to some dental schools to increase the number of its African American, Hispanic American, and Native American faculty.

A gender shift also is occurring in dentistry. Among the active private dental practitioners in the United States, nearly 83% are male, and slightly more than 17% are female. Among recently graduated dentists, those who earned their degrees within the past 10 years, slightly more than 65% are male, and nearly 35% are female. In addition, two thirds

of female dentists are under the age of 45. Women make up nearly 44% of all dental students.

As female dentists have traditionally shown more interest in devoting more of their time to providing oral care to the underserved, this bodes well for the profession. In addition, with women taking more and more leadership roles in organized dentistry, it is expected that dental societies will take an increasingly activist role in solving the access-to-care problem.

The practice of dentistry itself is an attractive profession. With some areas already experiencing a dentist shortage and others about to, dentists can practice just about anywhere they choose. Dentists increasingly keep flexible work schedules, achieving financial independence in a relatively independent environment. Surveys indicate that nearly 95% of dentists are glad they chose dentistry as a career. Dentists enjoy the people-to-people contact and the artistry and creativity inherent in the profession. While they often dislike business, personnel, and administrative issues, firms such as ProCare Dental Group PC have arisen to take such tasks off dentists' hands, allowing them to spend more time practicing.

A technological revolution in dentistry is allowing dentists to provide better care to more people more quickly. Digital radiography, dental lasers, cone-beam tomography, intra-oral cameras, lighting enhancements, and dental implants are some of the technologies that improve dental care every day.

Patients are more aware of and more educated about the need to maintain their dental health and to take responsibility for oral disease prevention, making the modern dentist's job easier as well. Through advertising, they are more aware of specific dental procedures and come to the dentist as educated buyers. Approximately 55% of children between the ages of 5 and 17 have had no tooth decay—another factor that makes the dentist's job easier.

Although some dentists object to it, the American Dental Hygienists Association (ADHA) is working on creating an "advanced dental hygiene practitioner" who would provide diagnosis, preventive, restorative, and therapeutic services to patients. The ADHA assures dentists that it is neither trying to compete with dental practitioners nor taking away hygienists from practitioners. In any case, the new advanced dental hygiene practitioner will

increase the availability of dental care for the public and serve as a liaison between patients and busy dentists, explaining procedures more fully on behalf of the dentist and guide patients in decision making.

Dentistry likely will change both rapidly and greatly in the future. Those educational institutions and practitioners who cannot adjust to the change will have difficulty, but those who can are likely to experience a new golden age of dentistry.

William S. Bike

See also Access to Healthcare; Health Professional Shortage Areas (HPSAs); Health Services Research, Definition; Kellogg Foundation; Public Health; Robert Wood Johnson Foundation (RWJF); Rural Health

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Robert Wood Johnson Foundation (RWJF):
<http://www.rwjf.org>
W. K. Kellogg Foundation (WKKF): <http://www.wkkf.org>

DIABETES

Diabetes mellitus, often referred to simply as diabetes, is not a single disease but a group of metabolic disorders characterized by hyperglycemia (elevated blood glucose) resulting from defects in insulin secretion, insulin action, or both. It is a major public health problem in the United States, affecting 24.1 million individuals, of whom an estimated 6.6 million are undiagnosed. From 2002 to 2007, the number of individuals in the nation diagnosed with diabetes increased from 12.1 to 17.5 million. In addition, an estimated 54 million individuals have abnormalities in glucose tolerance, which places them at high risk for developing diabetes. Approximately one third of the individuals born in the nation during 2000 are likely to develop diabetes during their lifetime. The social, economic, and personal costs of diabetes are enormous. This entry describes the classifications, complications, and risk factors of diabetes. In addition, prevention and complications are discussed, along with the social, economic, and personal costs associated with diabetes. Last, this entry addresses quality-of-life issues and policy implications.

Classification

There are four clinical classifications of diabetes: (1) Type 1 diabetes, (2) Type 2 diabetes, (3) “other specific types,” and (4) gestational diabetes mellitus (GDM). In addition, there are two categories of abnormal glucose tolerance: (1) impaired glucose tolerance (IGT) and (2) impaired fasting glucose (IFG). Type 1 and Type 2 diabetes are the most common forms of diabetes, representing approximately 10% and 90% of the diabetes population, respectively. Gestational diabetes mellitus, a form of diabetes diagnosed during pregnancy, affects 4% of all pregnancies. “Other specific types” of diabetes may result from a variety of factors, including

genetic conditions, surgery, drugs, malnutrition, and infections. IFG is characterized by elevated (though nondiabetic) fasting blood glucose levels, while IGT is characterized by elevated postmeal blood glucose levels. Individuals with IGT and IFG have a substantially increased risk of developing Type 2 diabetes.

Diabetes Complications

A variety of acute and chronic complications are associated with diabetes. The acute complications are medical emergencies and include diabetic ketoacidosis (DKA), hyperosmolar hyperglycemic syndrome (HHS), and hypoglycemia. The chronic complications include disorders associated with microvascular (small vessel) changes in the eyes, nerves, and kidneys, along with macrovascular (large vessel) changes in the heart, veins, and arteries. These changes result in retinopathy (eye disease, e.g., blindness); neuropathy (nerve disease, e.g., nerve damage affecting sensation and pain pathways in the hands and feet, nerve damage affecting the ability to digest food); nephropathy (kidney disease, e.g., end-stage renal disease requiring dialysis or renal transplantation); and premature and accelerated development of coronary heart disease (CHD), cerebrovascular disease, and peripheral vascular disease (PVD). In particular, heart disease and stroke account for 65% of deaths in people with diabetes. Diabetes-related complications are associated with excessive morbidity and mortality from heart disease, blindness, kidney failure, extremity amputations, and other chronic conditions.

Risk Factors

The development of Type 1 diabetes is associated primarily with an autoimmune destruction of the insulin-producing cells of the pancreas and is characterized by a nearly complete loss of insulin secretion. In contrast, Type 2 diabetes is characterized by insulin resistance and decreased insulin secretion. The development of both Type 1 and Type 2 diabetes is initiated by the interplay between genetics and the environment. Type 1 diabetes results when an environmental insult, in an individual genetically predisposed to the disorder, initiates

autoimmune destruction of the insulin-producing cells. The environmental factor initiating this destruction is not known and is an area of intense investigation.

Risk factors for Type 2 diabetes include genetics, age, ethnicity/race, dyslipidemia (excess levels of blood lipids or fats), obesity, hypertension (high blood pressure), prior gestational diabetes, polycystic ovary syndrome, and physical inactivity. Type 2 diabetes, a disease traditionally associated with middle-aged and older adults, has been increasing among children and adolescents. A variety of clinic-based reports and small-population studies indicate that this increased prevalence of Type 2 diabetes is highest among the youth of Native Americans, Blacks, and Hispanics. Currently, there are no large epidemiological studies of Type 2 diabetes among the youth; however, estimates from some urban clinic-based studies range from 30% to 50%.

The increased prevalence of Type 2 diabetes among minority youth is consistent with evidence that diabetes disproportionately affects the ethnic/racial minority populations of the United States. Among adults aged 20 years or older, the national prevalence of Type 2 diabetes is estimated to be 8.7% for Whites, 13.3% for Blacks, 9.5% for Hispanics, and 12.5% for American Indians/Alaskan Natives. In addition, ethnic/racial populations have higher rates of diabetes-related complications. For example, there are higher rates of retinopathy and diabetes-related renal disease in Blacks and Hispanics than in Whites. In particular, diabetes-related renal disease is 2.6 times higher among Blacks than among Whites. Diabetes-related complications among ethnic/racial minority populations are also associated with greater morbidity and mortality. During the years 1979 to 2004, diabetes death rates for Black youths were approximately twice those for White youths. In 2004, the annual average diabetes death rate was estimated at 2.46 per million for Black youths and 0.91 per million for White youths. The burden of the evolving epidemic of Type 2 diabetes, particularly among minority youths, has yet to be realized. As youths with early-onset Type 2 diabetes approach middle age, the excessive mortality and morbidity associated with diabetes-related complications will contribute to the increasing social, economic, and personal burden imposed by diabetes. The reason

why minority groups bear a disproportionate burden of diabetes is multifactorial; however, poor access to healthcare among these groups appears to be a major contributor.

Primary Prevention of Type 2 Diabetes

Weight gain and physical inactivity are the primary factors contributing to the epidemic of Type 2 diabetes. Lifestyle modification, involving change in diet, weight loss, and increase in physical activity, can slow the progression to overt diabetes. The Diabetes Prevention Program (DPP), a large research study sponsored by the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK), compared the effects of dietary and exercise counseling (control group), intensive dietary and exercise interventions (lifestyle group), and medications (particularly metformin, a popular antidiabetic drug) in preventing diabetes in men and women with IGT. After an average follow-up of 2.8 years, a 58% relative reduction in the progression to diabetes was noted in the lifestyle group, and a 31% relative reduction in the progression of diabetes was noted in the metformin group compared with the control group.

Prevention of Diabetes Complications

As the prevalence of diabetes increases, the complications of the disease also will increase, unless aggressive treatment strategies are implemented. The results of two research studies—the Diabetes Control and Complications Trial (DCCT) and the United Kingdom Prospective Diabetes Study (UKPDS)—clearly indicate that diabetes-related microvascular complications (retinopathy, neuropathy, and nephropathy) could be prevented or reduced by maintaining normal blood glucose levels. In addition, there is evidence that diabetes-related macrovascular complications (CHD, cerebrovascular disease, and PVD) can be reduced by factors such as blood pressure control, lipid control, smoking cessation, and aspirin use. Patients with diabetes can use intricate pharmacological regimens (along with diet and exercise) to normalize blood glucose levels. Newer insulin preparations, insulin delivery systems, oral medications, and blood-glucose-monitoring systems

have been developed to assist patients in maintaining normal blood glucose levels.

There are specific goals for glucose level, blood pressure, and blood lipid concentration. Chronic glucose control is measured periodically by hemoglobin A1C level, which correlates to average blood glucose levels over the previous 3 months. Daily self-management of diabetes requires constant vigilance and adjustment of diet, medications, and physical activity to normalize A1C levels. The best benefits can be achieved when there is a strong problem-solving relationship between the patient and the healthcare provider. This allows the patient to make adjustments to the plan of care (e.g., diet, exercise, oral medications, and/or insulin) in a supportive atmosphere.

Social, Economic, and Personal Costs

Diabetes and its related complications are associated with significant personal, social, and economic costs. National medical expenditures attributed to diabetes in 2007 were estimated at \$174 billion, including \$116 billion in medical costs and \$58 billion in indirect costs. Direct medical costs include expenditures related to hospital inpatient care, diabetes medications and supplies, retail prescriptions for diabetes complications, and physician office visits. Indirect medical costs include the costs resulting from increased absenteeism from work, reduced productivity at work and home, unemployment, disability, and loss of productivity due to premature death. Expenditures for diabetes were attributed to institutional care (\$65.3 billion), outpatient medications and supplies (\$27.7 billion), and outpatient care (\$22.7 billion). In particular, the costs were greatest for inpatient hospital stays (\$58.3 billion), physician's office visits (\$9.8 billion), diabetes medications and supplies (\$14.1 billion), and retail prescriptions (\$12.7 billion).

Individuals with diabetes have medical expenditures that are approximately 2.3 times higher than what expenditures would be in the absence of the disease. Indirect costs related to diabetes include the following: absence from work (\$2.6 billion), reduced performance at work (\$20.0 billion, or a loss of 120 million days), reduced productivity for those not in the workforce (\$0.8 billion), permanent disability (\$7.9 billion), and mortality (\$26.9 billion).

Quality of Life

Diabetes profoundly influences the lives of those affected and their families. Patients with Type 1 diabetes are treated with insulin, diet, and exercise, whereas patients with Type 2 diabetes are treated with diet and exercise and sometimes with insulin and/or oral medications. Patients may use insulin pumps or multiple insulin injections per day. Such a regimen necessitates frequent blood glucose testing with portable glucose monitors. The ability to minimize complications largely depends on the ability and willingness of patients to integrate the treatment regimens into their lifestyle. The ability of patients to integrate treatment regimens is influenced by many factors, including access to a healthcare provider, ability to pay, insurance coverage, perceptions of complication risk, and perception of treatment burden. End-stage complications, such as blindness, have the greatest perceived burden on the quality of life; however, comprehensive treatment regimens also have a high perceived burden on the quality of life. In a recent report, a small group of patients stated that they were willing to give up 8 to 10 years of life in perfect health to avoid life with treatment. The importance of understanding the factors that influence adherence to treatment regimens cannot be overestimated.

Policy Implications

The United States is in the midst of an epidemic of diabetes, which has increased exponentially over the past two decades. Diabetes is associated with a number of acute and chronic medical complications that lead to significant morbidity and mortality. Minority ethnic/racial populations in the nation disproportionately carry the burden of diabetes complications. Lifestyle modification programs, especially those incorporating intensive weight loss and physical-activity interventions, can result in the primary prevention of Type 2 diabetes. In patients with diagnosed diabetes, treatments aimed at normalizing blood glucose levels and controlling risk factors such as hypertension and dyslipidemia can delay the progression and development of diabetes-related complications. Health policy initiatives need to incorporate both primary prevention of diabetes

and prevention of secondary complications from the disease. The challenge to healthcare policy-makers is to balance the personal and societal benefits of preventing and treating diabetes with their monetary costs.

Laurie Quinn

See also Access to Healthcare; Chronic Care Model; Disease; Disease Management; Ethnic and Racial Barriers to Healthcare; Morbidity; Preventive Care; Public Health

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DIAGNOSIS RELATED GROUPS (DRGs)

Diagnosis Related Groups (DRGs) is a system that is used as a part of prospective payment to group cases of patients into more than 500 categories according to similar hospital resource use. DRGs have been used since 1983 by the nation's Medicare program to determine the level of payment to a hospital since patients who are grouped together under the same DRG code are expected to use approximately the same amount of resources. DRGs are important in health services research since all hospitals in the United States must code and are reimbursed by Medicare and other payers through this mechanism. Other nations have also adopted and use the DRG system.

Background

DRGs were first developed by Robert Fetter and John Thompson at Yale University in the early 1970s, with support from the federal agency Health Care Financing Administration (HCFA), now the Centers for Medicare and Medicaid Services (CMS). This system included the Medicare population in addition to newborn, pediatric, and adult populations.

DRGs were first implemented on a large scale in New Jersey in the late 1970s. The New Jersey Department of Health used DRGs as a form of prospective payment whereby hospitals were paid a fixed amount for a given patient. Since 1983, CMS has taken over the control of the Medicare DRG system as a form of prospective payment for hospitals, and the agency has been responsible for any revisions to the definitions for Medicare DRGs.

As a concept, DRGs were originally created to classify hospital admissions of patients who had similar International Classification of Disease, 9th Edition (ICD-9) codes, or ICD-9 codes, so that the relationship between the types of patients that a hospital treated could be used to better understand the costs that the hospital incurred. The general guidelines of DRGs were that they must use patient data that are routinely collected by hospitals, such as ICD-9 codes, age, and gender; they should include patients who have a similar pattern of resource use;

they should include patients with a similar clinical condition; and there should be a manageable number of DRGs that include all types of patients who are encountered as inpatients. The required data elements of a DRG include the principal and secondary diagnosis codes; procedure codes; and patient's age, gender, and discharge disposition.

DRGs are grouped in a hierarchical manner. First, DRGs are grouped into 25 major diagnostic categories (MDCs) that relate to a single organ system or etiology. HIV and multiple significant trauma were the two most recently added MDC groups. Next, MDCs are grouped as either surgical or medical categories. Last, patients in surgical categories are grouped according to the type of procedure performed, while medical patients are grouped according to their principal diagnosis. Some categories under DRGs have been designated with complications and comorbidities (CCs). This represents a condition that causes an increase in the length of stay by at least a day for 75% of patients. Age is also used to define some categories of DRGs.

The first Medicare DRG category is craniotomy with CCs for those greater than or equal to 17 years of age, while Medicare DRG category 316 relates to renal failure. Medicare DRG category 531 is for spinal procedures with CCs.

Critiques and Revisions

The Medicare DRG system has been revised over the years, and updates are generally made available on October 1 every year. In 2007, CMS implemented a significant revision to the Medicare DRG system and regrouped categories. Under version 25, the CCs have been recategorized to include the absence of CCs, the existence of CCs, and the major presence of CCs.

One criticism of the Medicare DRG system is that it does not perform well for nonelderly populations. In the late 1980s, the New York State Health Department conducted an evaluation of the Medicare DRG system and found it to be inadequate for the non-Medicare population. As a result, New York State entered into an agreement with the 3M Corporation to develop necessary revisions to the Medicare DRG system. This resulted in the All-Patient Diagnosis Related Group (AP-DRG) system that supported areas such as

organ transplants, high-risk obstetric care, nutritional issues, pediatrics, and other populations. A limitation of the AP-DRG system has been that there is no common set of formulas across states, unlike the Medicare DRG system, so therefore each state maintains its own information.

CMS has also noted that the MDC 15 does not properly capture the care that is provided to newborns and neonates and that updates to its DRG system have focused primarily on the Medicare population. As a result, CMS has encouraged others to develop or choose other DRG systems that currently exist to fit these needs. In 1986, the National Association of Children's Hospitals and Related Institutions (NACHRI) developed a Pediatric Modified DRG (PM-DRGs) for neonates and the pediatric population.

Although Medicare DRGs were initially developed primarily for payment, there was also a growing need to compare hospitals on the basis of resource use and patient outcomes, examine differences in inpatient mortality across hospitals, evaluate differences in complication rates, and identify continuous quality improvement projects, among others. Thus, the breadth and scope of DRGs needed to be expanded. From 1985 to 1993, HCFA supported two projects at Yale to expand the CCs categorization in addition to further studying severity of illness. These projects resulted in the Refined Diagnosis Related Groups (R-DRGs) and Severity Refined Diagnosis Related Groups (SR-DRGs). To date however, the SR-DRGs have not yet been implemented in practice.

In 1990, the 3M Corporation and NACHRI developed a new and enhanced DRG system that could better capture information on patients of all ages and counter some of the shortcomings of Medicare DRGs. The starting point for this project was the AP-DRGs and PM-DRGs. The expanded DRG system included subclasses for each DRG that would be indicated as minor, moderate, major, or extreme for the severity of illness as well as mortality risk. The end product of this collaboration was the All-Patient Refined Diagnosis Related Groups (APR-DRGs). The APR-DRG system is the only one to include the influence of multiple secondary diagnoses and their relation to the severity of illness and mortality. Thus, the APR-DRG system is able to assess the severity of illness of patients who have multiple comorbidities and has utility for payment

as well as quality-of-care initiatives. As of 2003, Version 20.0 of APR-DRGs has been released, and it includes 25 MDCs and 316 APR-DRG categories that classify a hospitalized patient into a mutually exclusive group. APR-DRGs are used by more than 20 states to compare hospital costs and mortality at more than 1,600 hospitals.

Future Implications

Since its development, the DRG system has been revised and updated by various parties to reflect the many changes in the way healthcare is delivered. The scope of DRGs has been expanded over the years to include reimbursement, benchmarking, and comparison of hospitals as well as other research. Additionally, prospective payment systems for various types of care have been established since the development of Medicare DRGs to include the neonatal, pediatric, long-term care, and Medicaid populations. Prospective payment continues to remain the primary method by which providers are reimbursed for care, and DRGs are the cornerstone of this mechanism.

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See also Case-Mix Adjustment; Centers for Medicare and Medicaid Services (CMS); Cost of Healthcare; Hospitals; Medicare; Medicare Payment Advisory Commission (MedPAC); Prospective Payment; Thompson, John Devereaux

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DIAGNOSTIC AND STATISTICAL MANUAL OF MENTAL DISORDERS (DSM)

The *Diagnostic Statistical Manual of Mental Disorders (DSM)* is an authoritative and comprehensive reference book devoted to the classification of psychiatric illnesses. The main purpose of the *DSM* is to provide a categorical classification system that can be used in clinical practice, research, and administration across healthcare professions. It facilitates communication within the field of mental health by providing a nomenclature that supports the standardized identification of psychiatric symptoms for diagnosis, prognosis, treatment, research, reimbursement of services provided, and medical record keeping. It does not address the causes of mental illness but rather provides a framework for consistent descriptions of various illnesses.

Revisions

The *DSM* has been revised five times over the past 25 years. In 1952, the American Psychiatric Association (APA) published the *DSM-I*. It was 130 pages long, defined 106 separate categories of mental disorders, and contained coding systems used by earlier diagnostic manuals, such as the *Statistical Manual for Mental Diseases*, which was published in 1933. The *DSM-I* also drew from

nomenclature developed by the U.S. Army and the Veterans Administration.

In 1968, the *DSM-II* was published, and it attempted to improve consistency with the International Classification of Diseases (ICD). The ICD is published by the World Health Organization (WHO) for similar reasons that had motivated the development of the *DSM*. The ICD provides an international taxonomy that assigns numerical codes to disease conditions. In the United States, the *DSM* is used in addition to the *ICD* codes. There were many new mental disorders added to the *DSM-II*, increasing the total number of separate categories to 182. Neither the *DSM-I* nor the *DSM-II* attempted to elaborate on specific psychiatric symptoms or their manifestations. Rather, the *DSM-I* and *DSM-II* emphasized the psychological underpinnings of psychiatric disease and were less focused on the itemized symptom clusters that identified the illness. This was an important distinction beginning with the third edition of the *DSM*, *DSM-III*.

The *DSM-III* was published in 1980. It was 494 pages long, and included 265 categories. The *DSM-III* attempted to transition from an explanatory tome of mental disorders to an objective and descriptive model based on empirical data, not theories and hypotheses. The most significant change was that the manual focused on symptom-based diagnostic criteria. Further developments included a multiaxial diagnostic framework that not only included the primary diagnosis but also supplemented it with relevant clinical information on contributing medical, psychosocial, and functional distinctions.

The *DSM-III-R* was published in 1987, and it not only refined definitions of many diagnoses but also included exclusionary criteria to be considered in ruling out a disorder.

After much research, the *DSM-IV* was published in 1994. It had a major focus on empirical research gathered by extensive literature reviews. Almost half of the categories included a clinical aspect, which required specific symptoms that cause impairment in various areas of functioning such as work, school, or social interaction. Many disorders were deleted (i.e., sadistic personality disorder and passive aggressive personality disorder), and other disorders were reorganized. Disorders were also added (e.g., bipolar-II disorder), as well as culture-specific

syndromes and disorders, which focus on age-, race-, and gender-specific problems. Other small changes were made to the nomenclature, such as the renaming of multiple personality disorder to dissociative identity disorder.

The latest version of the *DSM* is the *DSM-IV-TR*. Published in 2000, it consists of minor revisions, such as updating the literature reviews, correcting factual errors, and updating *ICD* codes.

Components

Currently, the *DSM* consists of three major components: diagnostic classification, diagnostic criteria, and descriptive text. The diagnostic classification is a list of the mental disorders, paired with a diagnostic code. The diagnostic criteria consist of a summary of each disorder and include both inclusion criteria, a list of symptoms that must be present and their duration, and exclusion criteria. Diagnoses may include subtypes that further specify the symptom presentation or severity of the illness. The diagnostic criteria component was developed to provide a framework to assist in clinical assessment. The descriptive text describes the diagnostic features, subtypes, culture, age, gender, familial pattern, differential diagnosis, as well as other relevant information.

Multiaxial Framework

The multiaxial system introduced in the *DSM-III* consists of five dimensions called “axis,” used to evaluate the phenomenological aspects of a patient’s mental health. The biopsychosocial model allows for the manual to be applied across different psychiatric disciplines and theoretical orientations. The axial system provides additional information designed to make clear a more comprehensive picture of the patient’s status.

Axis I consists of all major clinical disorders, such as childhood disorders (i.e., attention deficit, disruptive-behavior disorders, and tic disorders); delirium, dementia, amnesic disorder, and other cognitive disorders; mental disorders due to a general medical condition; substance-related disorders (i.e., alcohol or drug addiction); psychotic disorders (i.e., schizophrenia, schizoaffective and delusional disorders); mood disorders (i.e., depressive

disorders and bipolar disorder); anxiety disorders (i.e., generalized anxiety disorder, obsessive-compulsive disorder, and posttraumatic stress disorder); somatoform disorders; factitious disorders; dissociative disorders; sexual and gender identity disorders; eating disorders (i.e., anorexia nervosa and bulimia nervosa); sleep disorders; impulse control disorders (i.e., pathological gambling); and adjustment disorders.

Axis II focuses on disorders that are considered less acute and less responsive to treatment with medication, such as personality disorders and mental retardation. Personality disorders are further grouped in clusters that include specific behavioral patterns. For example, Cluster A consists of paranoid, schizoid, or schizotypal personality disorders. Cluster B contains antisocial, borderline, histrionic, or narcissistic personality disorders. And Cluster C includes avoidant and dependent personality disorders.

Axis III describes general medical conditions that might affect mental illness, such as depression resulting from a cancer diagnosis.

Axis IV contains assessments of psychosocial and environmental problems. There are nine categories of problems, consisting of family, social environment, educational, occupational, housing, economic, access to healthcare, legal system, and other (i.e., disasters and war).

Axis V contains the overall functioning score obtained from the Global Assessment of Functioning Scale (GAF). The GAF rates the social, occupational, and psychological functioning of adults. Scores range from 1 to 100, with a score in the 91 to 100 range meaning that the patient has superior functioning in a wide range of activities and has no symptoms, whereas a score in the 1 to 10 range means that the patient is in continual danger of severely hurting himself or herself or others or has made a serious suicidal attempt. The *DSM-IV-TR* also has specialized scales included in the GAF for Social and Occupational Functioning, Defensive Functioning and Global Assessment of Relational Functioning.

Criticisms

Although the *DSM* is highly regarded, it has been criticized. Some feel that attaching a label to a mental illness can result in a negative social stigma.

Despite attempts to address this through the development of a multiple axial system, the medical model is believed to reduce the patient to a one-dimensional categorical, clinical impression rather than recognize the multidimensional presentations existing along a continuum, which in turn would encourage clinicians to treat the whole person, not simply the diagnosis. Others have criticized the current *DSM* as being too cumbersome. For example, under schizophrenia, there are 69 various combinations of symptoms to fulfill the *DSM-IV* Criterion A and 483 “clinical subtypes,” if seven possible outcomes are taken into account, and many of these symptoms cross criteria and subtypes.

Despite the criticisms, the *DSM* has clearly advanced the field of mental health. The *DSM* has undergone a great shift from its first publication, which consisted of a theoretical basis of the etiology of disorders, to later versions that focus on more empirical data. Inclusion of symptom-based diagnostic criteria, as well as specific inclusion and exclusion criteria, has helped standardize diagnosis of mental disorders in many disciplines worldwide. All these factors have contributed to the *DSM* being recognized and accepted as an important source of information and knowledge. The *DSM-IV* has been translated into 22 languages and is considered the quintessential reference on psychiatric disorders. The next major revision, *DSM-V*, is not expected until 2012 or later, and there is much speculation as to the direction it will take.

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See also Health; Measurement in Health Services Research; Medicalization; Mental Health; Mental Health Epidemiology; National Institutes of Health (NIH); Public Health; World Health Organization (WHO)

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DIRECT-TO-CONSUMER ADVERTISING (DTCA)

In healthcare, the term *direct-to-consumer advertising* (DTCA) refers to the promotion of drugs and medical devices by their manufacturers directly to prospective users. Advertising to users via the media, such as newspapers, magazines, radio, television, the Internet, pamphlets and brochures, billboards, and direct mailing, is considered DTCA. Most discussions of DTCA, though, focus on the promotion of prescription drugs, those requiring a physician's order, through mass print and broadcast media, with growing attention to the Internet.

Before 1985, advertising of drugs available only by physician's prescription was directed only at physicians. Advertising directly to consumers is more recent and more controversial. It is legal in only two nations, the United States and New Zealand. The global pharmaceutical industry is lobbying to prevent a proposed ban of

DTCA in New Zealand and to lift bans in Europe and elsewhere.

In 2006, global drug sales totaled \$582 billion (45% in the United States and 30% in Europe), and DTCA expenditures were \$4.5 billion. If DTCA to the European Union (EU) is allowed, it is forecast to run to \$1 billion. From 1997 to 2002, DTCA expenditures in the United States more than doubled. However, the rate of growth in DTCA expenditures has slowed, and pharmaceutical firms still direct 86% of their promotional dollars toward direct marketing to physicians.

History

In the 19th century, promotion of patient medicines in the United States represented the largest print advertising spending by any industry. The federal 1906 Pure Food and Drug Act, passed in response to egregious abuses in the production and representation of food and drugs, was replaced in 1938 by the Food, Drug, and Cosmetic Act (FDCA), which gave the U.S. Food and Drug Administration (FDA) more authority to regulate the labeling of all drugs, then not distinguished as prescription and over-the-counter drugs. The FDCA prohibited "false or misleading labeling." The U.S. Congress assigned the regulation of drug advertising to the U.S. Federal Trade Commission (FTC). In 1951, the Dunham-Humphrey Act legally defined prescription drugs as distinct from those safe for consumers to purchase over the counter. In 1962, the Kefauver-Harris amendments to the FDCA moved prescription drug advertising regulation to the FDA, where it is currently handled by the Center for Drug Evaluation and Research, Division of Drug Marketing, Advertising, and Communications (DDMAC).

Until the early 1980s, prescription drugs were advertised only to physicians, primarily through detailing (company representatives who visited the physicians), sampling (provision of drug samples to physicians' offices), and professional medical journals. The 1962 amended FDCA required that advertisements not be "false or misleading," contain what it called a "brief summary" (relating to side effects, contraindications, and drug effectiveness), and have a "fair balance" coverage of risks and benefits. To supply the brief summary, drug advertisements in medical journals simply reprinted

the FDA-approved product labeling (package insert), constituting at least an entire page of very technical medical information in very small print. The mandated fair-balance requirement specified that the advertisement present an evenhanded account of all clinically relevant information and that the presentation not focus disproportionately on the benefits. Fair balance is measured not only in the quantity of information on both sides but also in quality (major vs. minor risks) and in presentation (legibility, readership, and size of font).

In 1981, after a few companies had tested direct-to-consumer advertisements in the marketplace, the pharmaceutical industry asked the FDA for permission to advertise directly to consumers, touting its educational benefits. Following a voluntary moratorium while it studied the issue, the FDA ruled in 1985 that the standards established in 1962 relating to advertisements to physicians were sufficient to protect consumers. The industry then began direct advertising. The FDA became the overseer of DTCA of the drug by its supplier via print, audio, and visual matter. The rules for DTCA were the same as they had been for advertising to physicians.

The industry quickly returned to the FDA to ask for a variance from the required brief summary, claiming it to be too long, and therefore expensive, for both print and broadcast media. Reflecting a changed political and regulatory environment, the FDA, in 1997, relaxed the requirement for broadcast advertising. It allowed the mention of both the drug's name and the condition it purported to treat (heretofore prohibited), along with a shorter version of the brief summary. In exchange for the condensed information, the advertiser had to make "adequate provision" for access to the complete required information (via Web page, toll-free telephone number, or by mail). Requirements for print advertisement remained the same. Drug advertising increased rapidly thereafter.

The FDA enforcement of its regulations does not include mandatory prescreening of advertisements. When an advertisement goes into use, the manufacturer must submit it to the FDA. If it is found to be in violation, the FDA can send warning letters and untitled letters (for less serious offenses) and occasionally, a request for corrective advertising. These letters are posted on the Center for Drug Evaluation and Research Web site. In

most cases, companies comply, so that the FDA rarely uses its seizure or injunction powers. When the latter does occur, companies become permanently obligated to prescreening of their advertisements and to other restrictions.

However, the FDA is hampered by understaffing, no ability to impose monetary penalties, and under the George W. Bush administration, by a requirement that notices of violations must clear through the Office of the Chief Counsel. Often the violation letters arrive after the natural end of the advertisement's use. The U.S. General Accountability Office (GAO) reports that many companies receive repeated notices of violations, sometimes for the same drug. In 2005, the FDA issued 60 such letters for violations of direct-to-consumer guidelines as compared with 158 in 1998.

Scrutiny and criticism of DTCA by state and local policy officials and organizations such as the APA and the AMA have steadily increased. The withdrawal of the Cox-2 inhibitor Vioxx, one of the most heavily direct-to-consumer promoted drugs in history, precipitated even more controversy. Concern over the advantages and disadvantages of DTCA led the FTC and the FDA to hold hearings in 2003 and 2005, respectively, to gather information about whether the regulations needed to be changed. Testimony ranged from requests for changed regulation regarding presentation of benefits and disadvantages, to an outright ban on all DTCA. The FDA issued more complete guidelines (without the force of law) to help advertisers know what it expected in advertisements. Numerous bills to limit DTCA have been introduced in the U.S. Congress and in the state legislatures.

In response to the heightened attention, the pharmaceutical industry adopted a "govern or be governed" approach to fend off impending government regulation. In 2005, the Pharmaceutical Research and Manufacturers of America (PhRMA), an organization of major U.S. drug companies, approved 15 voluntary guidelines (called "Guiding Principles"), an accountability office, and a panel (appointed by PhRMA) to track signatory company compliance. A total 23 companies signed on to the guidelines that took effect in 2006, but no penalties accrue for violation of the guidelines. Some critics doubt the potential success of the direct-to-consumer guidelines, pointing to the

mixed impact of earlier voluntary industry guidelines regarding physician detailing and continuing medical education. The guidelines call for, among others things, FDA compliant advertising, a clear educational focus, balance of benefits and side-effects, voluntary, pre-use submission of new television advertisements to the FDA for comment, and a delay of unspecified length on DTCA of new drugs until physicians have been educated about them. The national IOM calls for this moratorium to be 2 years (the length of time proposed in an anticipated U.S. Senate proposal), but the drug companies complain that their patent protection is too short to waste that long not advertising to consumers. The AMA's House of Delegates also called for a moratorium on new drug advertising at its 2006 meeting. However, manufacturers are circumventing the voluntary ban by use of more "news" and public relations activities to introduce new products to the public.

In recent years, about three fourths of DTCA went to television advertisements. For 2006, about 5% of DTCA budgets seems to have been diverted from television to magazine advertising. Pharmaceutical firm spending on DTCA has continued to rise but at rates slower than those seen from 1997 to 2005. Compliance with the PhRMA guidelines, changes in television viewer behavior, better-informed but cynical consumers, and the rise of the Internet as a source of information appears to explain this switch from television.

Internet DTCA spending by drug companies is estimated at 1% to 10% of their advertising budgets, and is expected to increase as they change from a scatter-shot mass media approach to one that targets patients with particular diseases. The 1997 FDCA modifications allowing less brief summary information being in broadcast advertisements, companies must make the expanded information available to consumers by telephone, mail, or the Internet. Many U.S. adults prefer the Internet to follow-up on such advertisements. Thus, the act alone feeds millions of self-selected potential patients to the drug Web pages for further information. No specific regulations exist for presentation of information in Web-based sources so those for print and broadcast advertising prevail. In addition to company or specific drug Web sites, companies also sponsor disease Web sites,

banner advertisements, pop-up ads, and e-mails as promotion and may optimize their Web sites to increase "hits." Critics point out that aspects of a Web page may resemble both print and broadcast media and may bridge the rules for labeling and for advertising. In addition, styles of information presentation may make it more or less obvious and accessible on Web pages as opposed to broadcast advertisements or print ads. For example, Web page hierarchy affects how unbiased information may be (e.g., homepage vs. a "deeper" page or number of "clicks" to access).

The EU has banned DTCA, but pharmaceutical industry pressure and, to some extent consumer demand, led observers to predict that the ban will be lifted. The WHO Criteria for Medicinal Drug Promotion says that advertising of prescription drugs should not be allowed. Meantime, as of 2008, New Zealand, the only country besides the United States with legal DTCA, has a voluntary moratorium and is considering a legal ban of such advertising. Pharmaceutical companies are lobbying to prevent a permanent New Zealand ban and to lift the current prohibitions in Europe and Canada. Currently, border crossing Internet advertising defies the bans outside the United States and New Zealand.

Controversy

A variety of issues make up the controversy regarding DTCA. Thousands of studies have failed to find consistent results examining advertising impacts on healthcare utilization and costs, on patient and physician behavior and interaction, and on health outcomes. Drug manufacturers are in favor of DTCA, but advocates and opponents are found in nearly every other stakeholder group—consumers, physicians, insurers, and policy experts. Proponents point to the educational value of advertising that informs consumers about diseases and drugs. Studies show that both consumers and physicians agree that DTCA increases physician visits and physician–patient discussions, and they have shown that some traditionally underdiagnosed disorders (e.g., depression) are found and treated as a result of this interchange. Studies show inconsistent results on the perceived value of that discussion. Consumers report that the advertisements are useful, especially if the physician actually gives

them a prescription. Some physicians like to have informed, questioning patients, while others find it burdensome to spend extra time to disabuse patients of misconceptions.

Proponents claim that the information included in advertisements is valuable to consumers, while many critics and studies show that it is biased, misleading, and confusing. Although consumers cannot actually purchase drugs directly based on advertised information, detractors claim that the quality of information is still important. Critics point out that presenting truthful and balanced information can conflict with a drug manufacturer's primary responsibility—to make money for its stockholders. Studies have shown that some consumers are appropriately skeptical of the information but that other consumers tend to concentrate on the benefits and not on the risks. Physicians report that consumers have unreasonable expectations and focus on the benefits advertised. Furthermore, many consumers assume that advertisements have been approved by a government agency and are, thus, truthful.

Critics fault the advertisements for medicalizing too many conditions (especially those better remedied with lifestyle changes), creating the false hope that there is a pill for every disorder and discounting the importance of lifestyle and behavior changes. Advertisements aimed at youthful consumers (e.g., acne preparations) are questioned, even by some proponents of DTCA. Critics also point to the possibility that advertisements create a sense of fear in consumers. Studies show that when “physicians” and celebrities promote a drug, sales increase despite the fact that the physicians are actors and the celebrities may or may not have ever used the drug. These techniques, plus the use of emotional images and words (rather than factual presentations), are decried by critics as misleading and not educational.

Most studies find that DTCA increases prescribing. Prescriptions for a class of drugs increase when a drug from that class is advertised (not necessarily for the specific drug in the advertisement). Studies are inconclusive about the extent to which the increase is due to necessary treatment of formerly undiagnosed illness or treatment of conditions that probably do not need treatment. In other words, they do not establish whether physicians are prescribing unnecessarily. Proponents point to

the advantage of patients' mentioning their concerns after an advertising prompt. Critics point out that a physician may simply act on the information by prescribing a drug instead of carefully exploring the patient's complaints, possibly resisting the patient's expectations for a drug treatment, or introducing the much harder recommendation for behavior change.

Studies find physicians split on the value of DTCA. Some welcome the more informed patient, but virtually all dislike the pressure they feel to prescribe at all or to prescribe a particular drug. Many report that convincing patients that they do not need a drug is a waste of their time, and some resent the imposition on their autonomy and questioning of their recommendations. Studies have led to recent moves to delay DTCA of new drugs because physicians report being embarrassed when asked for a drug that they have not yet studied.

Much research has explored whether DTCA has an impact on the cost of drugs or of health-care. Certainly, demand is induced by this form of advertising. Exploring the impact of DTCA on prescription drug spending, the Kaiser Family Foundation reports that a 10% increase in DTCA spending results in a 1% increase in sales for the class of drug. The Kaiser studies also found that physicians write prescriptions more for the most heavily advertised drugs. No proof of an exact cause-and-effect relationship has been established, since DTCA is usually accompanied by increased marketing to physicians. However, a 10% increase in spending on promotions to physicians resulted in only a 0.2% to 3% increase in sales as compared with 1% for DTCA. The Kaiser studies also determined that for every \$1 spent on DTCA in 2000, sales increased by \$4.20. Some studies indicate that the advertisements encourage switching to an advertised drug, which is almost always a newer, more expensive option and may also be less well established with regard to efficacy and risks. Certainly, a drug with a brand name costs more than the generic drug, which are not advertised. No evidence has been found indicating that DTCA causes increased drug prices.

Insurers and government programs such as Medicaid report pressure to add new, highly advertised drugs to formularies. Indeed, DTCA creates a “demand pull” that undermines the cost control and utilization limits of insurers and policymakers.

Professional organizations have periodically issued statements on DTCA. For example, the American College of Physicians (ACP), in 1998, supported it in principle but recognized the need for careful regulation to ensure accuracy. Among other recommendations, it suggested that physicians receive DTCA before patients so that they can be prepared. The AMA has issued guidelines for DTCA, and its 2006 House of Delegates called for a moratorium on new-drug advertising. Expressing general support of DTCA, the American Pharmaceutical Association (APhA) calls for enforcement of regulations and suggests that pharmacists be given prerelease knowledge of advertisements.

Future Implications

Most observers agree that DTCA is probably a fixture in the U.S. health marketplace and that Europe and Canada will likely approve it in some form in the future. However, nearly every stakeholder group has critics who are unlikely to go away. Critics call for more specific direction from the FDA regarding accuracy, balance, understandability, and more regulatory authority. In addition, they call for attention to the evolving varieties of advertising (including the Internet and cell phone) that do not fit within the mold of current guidelines.

Ruth Ann Althaus

See also Access to Healthcare; Pharmaceutical Industry; Pharmacoeconomics; Pharmacy; Prescription and Generic Drug Use; Public Health; Supplier-Induced Demand; U.S. Food and Drug Administration (FDA)

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DISABILITY

While there is widespread agreement that disability is a major concern in every society in the world today, there is considerable controversy about the definition, measurement, demography, healthcare requirements, costs, politics, and personal, familial, and societal consequences of disability. In 2000, the U.S. Census Bureau counted 49.5 million Americans with some type of long-lasting health condition or disability (19.5% of the nation's total noninstitutionalized population). Many individuals (12% of the population) had multiple disabilities, and more than 4% reported a mental disability. Experts think that the rate of mental illness could well be underreported. On a global basis, the World Health Organization WHO estimates that there are 600 million disabled people in the world. The United Nations (UN) estimate is 650 million. Recent global estimates conclude that by 2020, depression will be the number two cause of disability in the world.

The World Bank and other international financial institutions have taken a recent interest in disability because they see it as a major threat to economic development. Indeed, there is general agreement among experts that disability is more common in developing than in developed nations.

Disability Definitions

Disability definitions, which are culturally specific and contested, are used to signify a particular relationship of the individual to bodily norms, social role performance, and society in general. Disability is a condition where individuals are identified as not meeting the potential expected of them by society (expressed through social and cultural norms). People are judged to be disabled because of limitations in their physical and/or mental functioning, lack of social support networks, inability to perform normative social roles, and/or living in a barrier-laden environment that prevents them from fully participating in society. In this context, disability results from a maladaptive interaction between individuals and their environments. The result is often dependency, isolation, and poverty.

Disability definitions are culturally grounded. For example, in the United States, disabilities are typically determined by physicians according to diagnostic categories such as spinal cord injury, multiple sclerosis (MS), and depression. While members of some cultures will say that impotence, infertility, and diabetes are disabilities, according to the medical model, they are seldom classified as such.

Disability definitions are also strongly influenced by politics, ideology, and social policy. Physical disabilities are more likely to be diagnosed and reported than mental illness because of stigma and the added cost burden on governments and private health insurers to cover mental health services. The full effects of these differences are expressed in U.S. social policy and law. A search of federal statutory definitions of disability in the U.S. Code in 2005 revealed that disability was defined 67 times in different ways depending on whether the statute dealt with Veterans Affairs, developmental disabilities, the Fair Housing Act, Social Security Disability Insurance (SSDI), assistive technology, or employment-based legislation. In addition, the interpretation of these definitions is often constricted or relaxed depending on the

state of the economy and the availability of government resources.

Underlying these different definitions and determination of disability is a clash of paradigms used to conceptualize disability. The medical model views disability generally as a problem of the person caused by disease, trauma, or other health conditions and resulting in the need for individual medical care. Individuals are diagnosed and are generally referred to in terms of their primary medical diagnosis. Much of the medical and health services research conducted within this paradigm focuses on functional limitations, return to work, independence, and the performance of social roles.

In contrast, the social model of disability sees disability as a socially created problem. From this perspective, disability is not an attribute of the individual but results from conditions imposed on people by oppressive physical, social, work, transportation, and social policy environments. According to this argument, society has the obligation to make reasonable accommodations to disabled people so that they can be independent and live full lives. The WHO in its International Classification of Functioning, Disability and Health (ICF) has attempted to integrate these two positions by incorporating concepts and measurements of impairment, function, and communication along with those of activity, participation, and consideration of the environments within which disabled people live and perform.

More recent approaches to the understanding of disability have come from scholars such as Amartya Sen and Martha Nussbaum, who conceptualize disability in terms of human capacity and societal development. This approach has both moral and economic components, expressed in the obligations of states to all their citizens and the notion that preventing and dealing with disability will reduce dependency and improve the economic position of states. Disability and human rights advocates have also been using forms of moral arguments, human rights initiatives, and quality-of-life analyses to advance the cause of disabled people based on what is just and right in a society.

Disability as an Outcome

In health services research, disability is conceived as an outcome measured by functional status;

activity performance; role activities such as parenting, employment, and work; community involvement; connectedness in social networks; independence; and quality of life. Newer work sponsored by the Centers for Disease Control and Prevention (CDC) concentrates on the prevention of disability through programs such as enforcing the wearing of helmets when riding a motorcycle, genetic counseling, and prevention of secondary conditions such as bed sores and urinary tract infections related to spinal cord injury. Evaluation and intervention research on disability focuses on programs designed to increase mobility (e.g., wheelchairs, cut curbs, and accessible transportation), improve strength and flexibility (such as exercise and weight-bearing regimens), and keep people in school and at work.

On a familial level, disability outcomes are measured in terms of marital stability, having and raising children, economic self-sufficiency, and accommodation to roles and demands. On the societal level, disability has been measured by the “burden” that it exerts on social welfare systems and care institutions and by dependency and unemployment indices. Most recent work by medical geographers and sociologists examines disability in terms of place. Where one lives has an enormous impact on how one lives and the quality of life. Communities rich in resources and low in disruptive activities such as crime, high poverty, and unemployment can provide health and social support services and living conditions conducive to good health status, independence, and high quality of life.

Structure of Care for Disabled People

Care for disabled people is delivered through a complex set of government, not-for-profit, and private for-profit organizations in the United States. The systems are typically organized along the separate lines of physical and mental health disabilities. This causes problems for individuals who have both physical and mental health disabilities because the sources of care, services, and insurance are often different for physical and mental conditions. In 2005, Medicaid covered the medical and rehabilitation care for 14.6 million disabled and elderly recipients. In 2001, 5.7 million disabled workers received benefits through Social Security Disability Insurance (SSDI), and

1.6 million individuals received SSDI benefits as dependent family members of disabled workers. In 2004, the U.S. Department of Veterans Affairs (VA) provided disability benefits to 2.7 million veterans. In addition to these public programs, many employees have private disability insurance through their jobs and may have access to Worker’s Compensation. This is a program administered at the state level designed to provide medical, rehabilitation, and lost-time costs to injured workers. This contentious program historically has pitted labor and business against each other, with business seeking to limit coverage and costs and labor unions seeking to expand benefits. In 2006, nationally these benefits amounted to approximately \$16.1 billion. Taken together, these insurance programs and their related benefit structures are so complicated that experts suggest that anyone seeking disability benefits or dealing with disability insurance seek the counsel of healthcare experts and legal advice before applying for them. The programs and their interrelationships are not readily transparent to the consumer.

The medical and rehabilitation care structures are composed of government inpatient and outpatient services, care for the poor provided by the government through subcontracts with public and private hospitals, and care reimbursed by private insurance at community and private hospitals and rehabilitation systems and on an outpatient basis at many private rehabilitation clinics. In an effort to respond to pressures from the disability community and to cut costs, a large 5-year Medicaid demonstration project is being launched to evaluate the efficacy of providing long-term care in home and community settings rather than in nursing homes.

Access to Care by Disabled People

Disabled individuals in the United States face myriad challenges in accessing care, receiving appropriate treatment, and availing of rehabilitation services.

The first challenge for disabled people is that many do not have health insurance. According to the U.S. Census Bureau, in 2005, there were 46.6 million uninsured Americans, of whom a disproportionate number are disabled people. The number of uninsured has been growing since 2001. As a result, many disabled people fall into Medicaid by default and/or are forced to seek care for

episodic events in hospital emergency departments. Such utilization of care is crisis oriented and does not promote prevention or continuity of treatment. In an attempt to address some of these issues, Medicaid spending has been authorized to expand access to care for certain children with disabilities.

A second challenge is that there is differential access to care for disabled people depending on whether or not their primary medical diagnosis is for a physical or mental disability. Individuals find it much easier to arrange care for a physical rather than a mental disability such as posttraumatic stress disorder (PTSD) or depression. When individuals have both sorts of disabilities, the physical disability is often dealt with, while the mental disability is ignored or undertreated.

A third challenge to treatment of disability involves continuity of care. Disability and rehabilitation services are often delivered piecemeal and from different sources and programs. The result is that the program of support and care is not integrated and is frequently discontinuous. This can result in logistical nightmares for disabled persons and their families, services offered but not needed, services and support needed but not delivered, and costs involved in stopping and restarting care programs due to lapses in eligibility.

A fourth challenge to care is the bias toward institutionalizing the seriously disabled, mentally ill, and elderly. Such a bias results in a lower quality of life and increased dependency for those institutionalized. There is widespread agreement that the more humane treatment option is to keep disabled people with their families and in their communities as much as possible and to have supportive and care services delivered in this context. As a result, disabled persons can continue to work and be socially engaged with their family and friends instead of being institutionalized.

The fifth challenge to care is that the American approach to disability is strongly dominated by the medical model. In fact, physicians must determine if a person is disabled to receive benefits, they must medically treat the person, they must sign orders, and they must ascertain the person's progress from the disability. Since many physicians are focused on genetic, biological, surgical, radiation, and pharmacological interventions, the importance and expertise of assistive technology, reasonable

accommodations, universal design, social support, architectural, transportation, and diet and exercise professionals is frequently underappreciated. These elements of care may not even be integrated into the treatment plan.

A sixth challenge to care concerns the portability of health insurance. If disabled persons are fired or change jobs, they may find that they are without insurance when they are between jobs and that the prospective employer will not hire them because they are disabled. This leaves them vulnerable unless they immediately qualify for Medicaid or VA benefits. For these reasons, disabled people often remain at their jobs or end up poor.

Cost of Care for Disabled People

The economic costs of disability are enormous. The national Institute of Medicine (IOM) estimates that the total costs of disability in the United States is more than \$300 billion annually, more than 4% of the nation's gross domestic product (GDP). This sum is split about equally into direct costs associated with medical and rehabilitation care and indirect costs due to lost productivity. A critical question facing policymakers is how to allocate scarce resources across different kinds of disability conditions and situations. Current research is addressing whether costs should be considered on the individual level (treatment and support) or on the population level (burden of disability on society). The national Medical Outcomes Study relies on individual-level analysis to measure outcomes, while the Global Burden of Disease research has stressed community- and population-level analyses in describing the costs of disability to society.

On the individual level, current research shows that the costs related to specific conditions such as spinal cord injury, low back pain, ischemic heart disease, brain injury, depression, schizophrenia, and mood disorders vary considerably. Some conditions are much more expensive than others. It is clear that controlling for level of disability, more money is being spent on visible, nonstigmatized conditions such as ischemic heart disease and spinal cord injury than on less visible and stigmatized conditions such as hepatitis C, herpes, mood disorders, and depression. The cost of pharmaceuticals

is another source of high costs when evaluated in terms of desired, efficacious outcomes. Numerous studies have shown that more than 50% of patients with depression and dementia were not being treated with appropriate drugs.

On the population level, there is a tremendous disparity between how much money is being spent on diagnosis and treatment and how much is being spent on prevention and population-based interventions. Only 3% of all healthcare costs in the United States are spent on public health programs and initiatives such as exercise programs for disabled people, education and inoculation against human papillomavirus (HPV), injury prevention, nutrition education, environmental pollution, motorcycle accidents, and disabilities caused by firearms. The return on investment from each type of intervention is enormously different. Public health programs and interventions generally are much more cost-effective than treatment of individual conditions. In addition, intervening upstream is much less costly than waiting for a problem of large proportions to hit. Smoking is an example of this logic. The problem is that intervening on the population level produces heated public debates, while treating a disabled person after the problem has occurred is less contentious in the public's eye. Therefore, cost-effective solutions to disability-producing behavior and conditions and increased funding are unlikely to occur on the population level until problems reach large proportions. Much of this has to do with public values, attitudes, and perceptions and is supported by the strong lobbies of the medical and pharmaceutical sectors of the economy.

Quality of Care for Disabled People

The quality of care for disabled people in the United States is highly variable. On the one hand, care in integrated centers such as the Rehabilitation Institute of Chicago is as good as any in the world. On the other hand, care for poor disabled individuals in the inner city of large urban centers or in rural areas often fails to live up to the same standard.

The recent scandal at the Walter Reed Army Medical Center in Washington, D.C., represents the best and worst of American disability care. Veterans of the Iraq and Afghanistan wars who lost limbs in combat were treated with exemplary

care from injury on the battlefield to transportation, medical-surgical care, provision of prosthetics and assistive devices, and extensive rehabilitation. However, this quality of care is generally reserved for veterans who remain active members of the military and who have certain types of physical disabilities. There are numerous examples of veterans with brain injuries resulting from explosive devices or sniper fire, PTSD, and neurological conditions that were not properly diagnosed or treated. In fact, the rehabilitation potential of many of these veterans was underestimated.

In the civilian disability world, the quality and comprehensiveness of care is predicated on an individual's place in the social structure and on an individual's employment and insurance status. There are different experiences for the poor, the middle class, and the wealthy, for the employed and the unemployed, and for the insured and the uninsured. Hence, there is considerable room for research on health disparities in the disability arena.

Quality of care is usually measured in terms of structure (the resources of the institution, level of training and staffing, staff-patient ratios, and expertise of the providers), process (how much care, of what type, over what period of time, and how comprehensive), and outcomes (lack of complications, level of function, return to school or work, integration into the family and community, and perceived quality of life). National initiatives such as the use of the Functional Index Measure (FIM) to monitor the progress and outcomes of adults, seen at many of the physical rehabilitation units and hospitals in the United States, and similar work by the Vermont-Oxford Network to follow patient progress and outcomes of pediatric patients provide invaluable evidence-based and outcomes data useful for clinical practice and research. Such monitoring and evaluation systems to assess the quality and outcomes of disabling mental health-care are not as well developed or prominent.

Future Implications

The task of balancing costs and quality of care is a persistent topic in contemporary health services research. This theme is reflected in the rapid growth in the disability literature on evidence-based medicine (EBM) and medical outcomes. In

the disability arena, there does not seem to be a strong correspondence between cost and outcomes. For sure, disability is an expensive business, but throwing money at the problem does not necessarily yield the desired benefits. Health services research has much to contribute to disability and rehabilitation outcomes on both the individual and the population levels. These priority areas of interest concern (a) the mix and timing of services, (b) integration of care, (c) consideration of both physical and mental disabilities and their concomitant interactions, (d) reintegration of the individual into the family and community, (e) support that allow individuals to live independently in the community, and (f) reduction of health disparities among disabled people. Encouraging more interdisciplinary work involving healthcare, clinical, and social science researchers would enhance the utility of future research. Even more important, however, is including disabled people in the design and execution of research projects and in translating research into action.

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See also Access to Healthcare; Activities of Daily Living (ADL); Long-Term Care; Medicare; Mental Health; Nursing Homes; U.S. Department of Veterans Affairs (VA); Vulnerable Populations

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- National Center for the Dissemination of Disability Research (NCDDR): <http://www.ncddr.org>
- National Center for Health Statistics (NCHS): <http://www.cdc.gov/nchs>
- National Organization on Disability (NOD): <http://www.nod.org>
- U.S. Census Bureau: <http://www.census.gov>
- U.S. Social Security Administration: <http://www.socialsecurity.gov>

DISEASE

The term *disease* encompasses a broad range of pathologic conditions and, as a concept, is primarily objective in its nature and scope. Any condition that impairs the functioning of an organism may be classified as a disease. This concept is much less complex than the seemingly opposite idea of health. The state of health is more subjective in characterization and, as defined by the World Health Organization (WHO), is a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity. Thus, one cannot simply define disease as the absence of health. The presence or absence of disease may, indeed, be strongly correlated with an individual's perceived health status; however, the relationship is not intrinsically linked. There are a multitude of cultural and social influences that alter an individual's state of health as perceived by himself or herself or by his or her community.

Many different classification systems of disease exist; the ancient field of nosology is a branch of medicine that studies the classification of diseases. One common classification system categorizes disease states as extrinsic or intrinsic to the human body or of unknown origin. The extrinsic category of diseases is sometimes referred to as acquired diseases. Exogenous factors that may

contribute to this category of disease include physical, chemical, nutritional, and biological factors. The intrinsic categorization includes hereditary and hypersensitivity (immunologic) disorders.

Extrinsic Diseases

The physical factors that contribute to disease include mechanical injury, nonionizing energy (e.g., electricity, microwaves, radio waves), and ionizing energy (e.g., x-rays, gamma rays, cosmic rays). Currently, in the United States, injury accounts for about 2.3 million hospitalizations each year and is the leading cause of death worldwide in young people between the ages of 10 to 24. The chemical factors that contribute to disease include metallic poisons, nonmetallic inorganic poisons, alcohols, asphyxiants, corrosives, pesticides, medicinals, warfare agents, and hydrocarbons. Many agents within this category of chemical factors may be contributors to certain types of cancers. The nutritional deficiency factors that contribute to disease states include metals (responsible for anemia), nonmetals, proteins, and vitamins. Among the WHO's Millennium Development Goals established in 2000 is the objective to reduce by half the number of people (852 million) who suffer from daily hunger. The biological factors include plants such as tobacco, marijuana, and opium. Cigarette smoking greatly affects the health of persons around the world. Every year, at least 4.9 million people around the globe die from tobacco use. Other biological factors include bacteria, spirochetes, viruses, rickettsia, fungi, parasites, protozoa, and helminthes. Infectious diseases continue to play a prominent role in world public health. However, with the discovery of biological agents as the cause of certain diseases and subsequent medical discoveries such as vaccines and antibiotics, the world has seen significant changes in the disease burden attributable to these factors. In addition, today, biological warfare is of prime political concern in the United States and around the world, with attention being placed heavily on preparation for action by homeland security, medical and public health officials, and law enforcement authorities.

Intrinsic Diseases

Hereditary factors contribute to a sizable number of intrinsic diseases. Diagnoses categorized within this category include diseases such as phenylketonuria, Down syndrome, Turner's syndrome, and diabetes mellitus Type I. It should be noted that diabetes mellitus Type II, as well as other chronic diseases, likely have some genetic component as well. However, these disease states are multifactorial as behavioral factors contribute significantly to the manifestation and progression of these diseases. Currently, chronic diseases are the leading cause of death in the world, causing 29 million deaths worldwide in 2002, an estimated 35 million deaths worldwide in 2005, and an estimated 36.6 million deaths worldwide in 2007. Hypersensitivity factors, as well, contribute greatly to the category of intrinsic diseases, which includes diagnoses such as asthma, lupus, and rheumatoid arthritis.

Diseases of Unknown Origin

Some disease states may not have a clear cause or etiology and are, thus, included within this category. Alzheimer's dementia is an excellent example of a disease classified in this category (although some may place this disorder within a degenerative disease category under the broad classification of acquired, or extrinsic, diseases). The prevalence of Alzheimer's continues to rise in the United States and in other high-income countries.

Other Disease Classification Schemes

The field of pathology investigates the scientific mechanism of the disease process, and as this field of medicine becomes more precise, the cause of many diseases may be found to be multifactorial, and they fall within multiple categories, or they may constitute a not previously recognized categorization. Other disease categories that in more recent years are being recognized, while not adhering well to the historical categorization scheme, include occupational, psychiatric, degenerative, neoplastic (cancer), and iatrogenic diseases.

Diseases may, as well, be described in various manners. For example, some disease states may be acute (severe in symptomatology but short in duration),

while others may be periodic (recurrent) or chronic in nature (of a long duration). Diseases may also be described by organ system, such as cardiovascular, respiratory, and gastrointestinal diseases.

The Medical Approach to Disease

The medical approach to disease centers on the manifestation apparent within the patient. The initial diagnostic clues fall within a category of objective complaints, or symptoms, described by the patient to the medical practitioner. This patient history is elaborated through a series of open-ended, ideally, or closed-ended questions from the medical practitioner, providing him or her with a set of information allowing the narrowing of the differential diagnosis, or diagnostic possibilities. Objective data are obtained through a physical examination, laboratory testing, and diagnostic tests. This information is referred to as signs and allows the practitioner to advance his or her approach to the disease in question through an algorithm. After, or during the process of, a medical decision, a patient may choose to have the practitioner initiate the use of medical or surgical interventions or other therapeutic modalities. Through this method, a disease process is delineated and addressed.

Cultural and Social Aspects of Disease

Medical anthropologists and medical sociologists study the cultural and social aspects of health, illness, and disease. There are many surrounding themes that become critical in the consideration of disease in relation to these issues. The cultural and societal views of life, individualism, morality, and normality, for example, can greatly influence a particular disease state. There may be many social ramifications of being affected by, associated with, and/or even discussing a certain disease. Many disease states have been stigmatized in certain places and times, leading to societal judgments and, in some cases, fear. These types of reactions are not necessarily rational when viewed from a scientific perspective but are, nonetheless, a significant result of the disease state and continuing aspect of the individual's state of health. The impact that these factors have on the patient and his or her family can often be extraordinary. Just

as there are sometimes negative connotations associated with disease states, some cultural and social attitudes may attribute legitimization to disease states or provide social benefits to specific diseases, or disease states in general. For example, through social programs, monetary aid may accompany certain diagnoses, and work expectations are often affected, as well. Ideas of morality and ethical considerations challenge individuals as they attempt to mesh personal considerations of a disease state with societal norms and medical expectations. Bioethical considerations exploring quantity of life versus the importance of quality of life, for example, then become central in the consideration of end-of-life issues.

Disease Acquisition

Medicine is primarily concerned with the diagnosis and cure of disease states within individuals, while public health is concerned with the role that disease plays within a population. Regardless of the level of intervention and study, one aspect that both fields scrutinize is the manner in which disease states are acquired. Risk factors, at the individual or population level, are directly tied to causation. By identifying these factors and understanding the role they play, medicine and public health have a greater understanding of the disease state itself. In addition, the two fields are better equipped to prevent or combat these disease states through this understanding. Commonly recognized categories of risk factors include biologic factors (such as genetic predisposition or age), environmental factors (e.g., air and water quality), lifestyle factors, and psychosocial factors. In consideration of populations—social, economic, and cultural factors have a profound effect on disease and health status. Many factors, at a population level, have been determined to be underlying health determinants that may increase individual risk of disease acquisition and/or severity. Examples of these health determinants include social status, access to healthcare services, educational status, race, and family income. These and many other cultural and social factors influence greatly not only the manner in which disease states may be acquired but also how they are experienced and perceived, as well as the manner in which a community may respond to them.

Disparities and Disease

Individual health behavior does play a significant role in the development of diseases, but many other factors affected by inequities are central to the determination of an individual's health behavior. Addressing issues such as poverty, education, access to healthcare, and special protection for vulnerable groups allows for the possibility of healthy choices. As an example, the primary risk factors contributing to chronic diseases—unhealthy diet, physical inactivity, and tobacco use—are consistent across divisions of economic status, gender, and age. However, the availability of resources plays a key role in the ability of an individual to prevent or combat these conditions. Thus, often, low-income countries experience a “double burden” of disease, simultaneously overwhelmed with the effects of communicable and noncommunicable diseases.

Several misunderstandings surrounding chronic diseases have caused them to be neglected on a global scale, increasing their burden with the passing years. A general view holds that chronic diseases are of significant health concern only in high-income countries and that communicable diseases pose a more significant threat to low- and middle-income countries now and in the future. While the deaths attributable to infectious diseases, maternal and perinatal conditions, and nutritional deficiencies combined are projected to decline by 3% in the world over the next 10 years, deaths due to chronic diseases are projected to increase by 17%. Nearly two thirds of the currently projected 64 million people who will die in the world in 2015 will die of a chronic disease.

The poorest people throughout the world are the most at risk of developing chronic diseases and dying prematurely from them. Poverty leads to increased vulnerability due to associated greater exposure to risks, higher levels of risk behavior, decreased access to healthcare services, social exclusion, increased psychosocial stress, and unhealthy living conditions. This social determinant, thus, is consistent with an environment where healthy choices and opportunities may not be readily available. The critical importance of this fact is that poor health of the community impedes development, which in turn predicts worsening health. Worst yet, low-income countries are affected by a disproportionate share of the burden of

chronic disease, and even in high-income countries, it is apparent that the socioeconomic gap is widening. Thus, as a general rule, around the world, the effects of poverty are increasing.

The Global Burden of Disease

The WHO suggests that disease policy should be based on comprehensive and integrated public health action, intersectoral action, a life course perspective, and a stepwise implementation based on local considerations and needs. It is important to recognize individually and collectively the range of public health priorities to ensure the well-being of the world's population. These priorities include HIV/AIDS, other infectious diseases, hunger, access to healthcare, infrastructure, clean water, mother and child health, and immunizations, among others, in addition to the importance of chronic diseases. It is also critical to recognize the social determinants of health, including the social gradient, stress, early life, social exclusion, work and unemployment, social support, addiction, food, and transportation. It will be necessary in the years to come to build cohesive, comprehensive, and easily accessible health systems and resources around the world in order to address the impact of diseases on individuals, communities, and society at large.

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See also Acute and Chronic Diseases; Emerging Diseases; Epidemiology; Health; International Classification of Diseases (ICD); Morbidity; Mortality; Public Health

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Centers for Disease Control and Prevention (CDC):
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National Institutes of Health (NIH): <http://www.nih.gov>

World Health Organization (WHO): <http://www.who.int>

DISEASE MANAGEMENT

Disease management is the concept of improving or sustaining the health outcomes and quality of life of populations with chronic conditions while reducing the cost of healthcare. The aim of disease management programs is to prevent and minimize the effects of chronic conditions or disease in which patient self-care plays an important role. This is achieved through a systematic, population-based approach of identifying individuals who are at risk, intervening through targeted programs, using evidence-based guidelines, and measuring the results and outcomes of these efforts. The model of disease management focuses on coordinating a continuum of care for populations with similar or the same chronic conditions. The components of disease management programs support the provider-patient relationship and the plan of care; focus on the prevention of complications and worsening of the condition through the use of clinical guidelines; and assess patient outcomes and costs on a regular basis with the goal of improving overall health. Disease management is also known by the terms *disease self-management*, *care management*, and *health management programs*.

Background

The rise in the prevalence of chronic diseases has put an enormous strain on the economy because of a reduction in worker productivity and the increase in healthcare expenditures. The rapid escalation in healthcare costs and the pressure to contain costs by the purchasers of healthcare was one of the primary forces that led the way toward disease management. Because of these growing expenditures, purchasers began to question what the relative value of healthcare was for their dollar and started to take a closer look at inappropriate use of services.

Managed-care initiatives were another factor that led the way for disease management initiatives in the late 1980s and early 1990s. Managed care, through its prepayment mechanism and risk sharing with providers, created financial incentives that encouraged the efficient and effective delivery of care as opposed to traditional fee-for-service, which rewarded providers for performing more tests and procedures. Furthermore, because of managed care’s involvement in the continuum of patient care, disease management was more feasible under this model. Based on the concept of case management, managed-care organizations began to look into disease management as an approach to address chronic conditions at the population level. Beginning in the 1990s, disease management programs began to flourish primarily because of the goal of managed care plans to offer their members a product that was of high value.

The pharmaceutical industry was another major force that shaped disease management. Because of the growth in pharmaceutical benefit managers and managed care, the pharmaceutical industry underwent rapid consolidation and integration to increase its leverage in the healthcare market. As a result, the pharmaceutical industry transformed its image from a drug manufacturer to a healthcare company with direct marketing to consumers. Pharmaceutical companies began to offer disease management programs centered on prescription drug use in order to promote patient compliance with medications. These programs often included provider education, patient information, and counseling, and they were then sold to managed-care organizations and employers.

The increased development of clinical practice guidelines also helped facilitate the growth of disease

management. Clinical practice guidelines are generally evidence based, and they represent a systematic approach to treating patients with similar conditions. Managed care's influence over the healthcare system promoted the use of clinical practice guidelines by providers to increase the probability of improved patient outcomes. Finally, research on patient outcomes and cost-effectiveness that cover a variety of conditions has allowed the development of effective disease management strategies.

Because of the several forces described above, disease management programs have gained popularity and have become an accepted method to improve the health of populations with chronic conditions. Disease management programs are designed to address a group of the population that is at risk for chronic conditions. Several aspects of disease management have been around for many years in medical practice; however, this strategy as a concerted effort has taken shape only recently. Disease management programs have not been able to become organized previously due to the fragmented nature of healthcare, minimal data collection efforts, insufficient information technologies, and lack of treatment guidelines. Only recently have disease management programs been able to accelerate in growth due to the enhancement of information technology systems, capitation reimbursement that provided financial incentives to be cost-effective, improved clinical guidelines, and increase in outcomes measurement.

The evolution of disease management programs is described as maturing in sophistication, starting from a program that began with a few services to address chronic disease care to one that focused on targeting the highest-risk patients with outreach and education. This then led to a model with a population-based approach, integrated care, and the use of evidence-based clinical guidelines, and, finally, to a model that aims to optimize health through prevention efforts. The promise and potentials of disease management programs include reduction in healthcare costs and improved patient outcomes.

Disease Management Concept

Disease management has used effective strategies to improve the health of populations with chronic conditions. The aims of disease management include

the improvement in patient outcomes, a patient-centered approach to treating and addressing multiple conditions, and lowering costs by reducing unnecessary or redundant services and costs associated with poor outcomes. Patients may have one or more chronic conditions, and therefore, the coordination of patient care is paramount to reduce duplicative and redundant efforts in disease management programs.

The concept of disease management is different from that of case management in terms of its strategies; however, there are similar shared goals between the two, such as reducing costs and improving patient outcomes through the use of interventions. Whereas case management tends to focus on an individual patient for improving a medical condition on an episodic basis, disease management is population based and is more proactive in its approach. Nursing outreach programs is a strategy that many disease management programs use to provide oversight and support to patients. The nurse typically serves as a point of contact for the coordination of patient care. Medication compliance is another example of a disease management initiative that was used by pharmaceutical companies to increase patient adherence to treatment regimens.

The Disease Management Association of America (DMAA), the organization that represents disease management professionals, has identified six components that disease management programs should contain: (1) the identification of population processes; (2) clinical guidelines that are evidence based; (3) a collaborative practice model that includes self-support providers and the physician; (4) patient education focusing on self-management; (5) performance measures of processes and outcomes, as well as evaluation and management; and (6) routine reporting.

The processes of disease management may include self-management practices, patient education, and provider training. The disease management model is designed to increase communication between patients and providers and provide feedback for necessary behavior modification, as well as to assess the effectiveness of interventions. This model, if it is structured properly, includes a comprehensive approach to patient care that goes beyond the use of medications.

Some of the chronic conditions that disease management has been developed for include

asthma, diabetes, heart failure, hypertension, and chronic obstructive pulmonary disease. Asthma was one of the first targets that disease management practices were developed for because high-cost asthmatic patients are easy to identify, through their medication refills, clinical guidelines, and outcome measures.

Disease management can be offered through different delivery models, such as a contracted carve-out model, or as primary-care case management (PCCM). In the carve-out model, patients with chronic conditions are cared for by disease management organizations that are contracted by a health plan to provide this service. A managed-care plan may contract with a disease management vendor through competitive bids. Under the PCCM model, a specialized team within a managed-care organization helps the primary-care physician to treat patients with chronic conditions. Some early examples of PCCM include Group Health Cooperative of Puget Sound, Harvard Pilgrim Health Care, and Kaiser Health Plan.

Disease Management Design

There are four main parts that constitute a disease management program: (1) claims data analysis, (2) population selection and targeting, (3) intervention, and (4) quality measurement. These components are necessary to achieve lower costs and improved patient outcomes.

Claims Data Analysis and Population Selection

The disease management process entails the substantial use of data to meet the program goals as well as to ensure its effectiveness. Claims data analyses are used to evaluate which medical condition or conditions are the most costly as well as to determine the prevalence of disease within a given population.

Disease management programs are generally designed with the intent of improving care while reducing costs in the long term. Therefore, the next step is to identify the segment of patients with the identified condition(s) who have the highest cost and utilization patterns. The results from the claims data analysis can be used to guide the selection of the patient population that will be targeted for

disease management. By analyzing patient utilization patterns, the Pareto principle generally holds that a small proportion of patients account for the vast majority of the total costs. Approximately 20% of patients are responsible for 80% of health-care expenditures; and therefore, this small group of patients can be targeted with interventions to have the greatest impact in reducing costs. Data can also be analyzed by provider service categories to identify trends in utilization and medical costs. Patient groups can be targeted based on (a) non-compliance of their treatment regimen, (b) a high probability of improved health outcomes or potential for intervention, and (c) inappropriate use of services and utilization that can be reduced. Patients from the claims analysis can also be stratified or selected into specific subgroups based on their belonging to certain categories such as Medicaid, Medicare, managed care, or long-term care.

Intervention

The intervention is the central aspect in the implementation of disease management programs and entails both provider and patient participation. Disease intervention must include both prevention and the proper treatment and management of the given condition.

The intervention goals of the provider are implemented in this phase, and education on the clinical guidelines, the monitoring plan of the patient, and the type of feedback that will be given to the patient are established. Providers are also made aware of the referral programs and case management that are available to patients.

The intervention targeted at the patient can comprise behavior modification, lifestyle change, and health education in addition to the use of medications. This phase also includes baseline assessments, risk assessments, feedback on performance and outcome goals, education on treatment compliance, patient outreach, and other case management activities. The patient intervention may incorporate the use of videos, brochures, and prescription reminders to facilitate compliance and may also include involvement of the family members and caregivers. Disease management programs must be reviewed regularly to reflect updated treatment recommendations and clinical guidelines as well as the accepted standard of care.

Patients who suffer from an acute episode, such as a heart attack, may also need continuity of care to lead to recovery. Aggressive case management may be used as a disease management tool to plan and monitor treatment across the different settings of care. The purpose of case management is to prevent complications and reduce the use of costly and inappropriate services. A recovering patient may need rehabilitation services, home health care, and other services arranged, and therefore, a managed-care organization may assign a case manager to coordinate these needs.

Performance Measurement

The growth in the sophistication of information technology capabilities has allowed disease management programs to be implemented and evaluated. The advancements in information technology systems, such as the electronic medical record, have permitted the measurement and analysis of program performance.

Disease management programs that are successful must have a form of quality measurement. It is essential that disease management programs have realistic, feasible, and measurable goals for program evaluation. Cost, quality, provider and patient satisfaction, and changes in health status should be measured to monitor and evaluate disease management programs. Measurement is an important activity to evaluate whether a disease management program is achieving its objectives.

Three specific dimensions of any disease management program that should be measured to assess quality improvement of patients are (1) structure, (2) performance (process), and (3) outcomes. Examples of structural elements are the organizational and administrative coordination of patients and the delivery of healthcare services.

Performance or process indicators include the measurement of performance and comparing it with predefined targets. To have an effective disease management program, performance indicators must be assessed regularly to track the performance of the program goals and predefined targets by comparing these results with baseline measures through the use of benchmarking. An example of a performance indicator in a diabetes disease management program is the tracking of hemoglobin A1C levels of patients over time. Since

performance measures represent the intermediate measures of an intervention, they can be used to predict patient outcomes.

Finally, outcome measures reflect the end results of a given intervention. The difficulties with outcome measures is that outcomes can take a long period to observe and measure and, as a result, are more challenging and costly to obtain. Because outcomes are frequently difficult and expensive to measure, performance indicators are generally used to assess the effectiveness of disease management programs. An example of an outcome measure in a diabetes disease prevention program is the incidence of blindness due to diabetic retinopathy.

Measurement Instruments

To properly measure if the program is meeting its intended results, appropriate tools or instruments are needed. Some of the instruments used to measure patient outcomes include patient charges, utilization of healthcare services, and patients' general and disease-specific health status.

Cost Assessments

Disease management programs should assess the total costs associated with the treatment of patients. Prior to the implementation of the disease management program, the methodologies used should be defined, and baseline assessments should be conducted to make comparisons after the program implementation. One of the methods most commonly used to assess financial outcomes in disease management programs is the total-population approach. However, the major limitation of this approach is that there is no control group because of the pretest-posttest design that could lead to errors in measurement. The major challenges that remain in evaluating the effectiveness of disease management programs include accurately determining that a program is controlling costs and utilization of services in populations with chronic conditions.

Reimbursement

Providers of disease management programs may be reimbursed through several different mechanisms. These mechanisms include flat fee, flat fee plus incentives, or performance-based reimbursement.

Flat Fee

Flat fee is a reimbursement structure where disease management vendors or providers are paid a set administrative fee, such as per member per month (PMPM), to care for a pool of patients. This fee includes all the administrative expenses related to the pool of patients for disease management activities, but it does not include the costs of direct patient care, such as physician visits or lab tests. Some of the expenses that are covered by the flat fee include patient education materials, case management services, tracking and monitoring patient outcomes, and monitoring patient and provider compliance with treatment goals.

Flat Fee Plus Incentives

The flat-fee-plus-incentives model includes the set administrative fee in addition to a financial incentive for disease management vendors or providers who meet predetermined program objectives. Some examples of these objectives could include decreasing inappropriate emergency room utilization and hospitalizations. Under this payment mechanism, the disease management organization or provider is not obligated to meet the savings goal, and the health plan is placed at financial risk if the minimum savings are not achieved.

Performance Based

Under the performance-based model, disease management organizations are placed at financial risk of repaying administrative fees to the contracted health plan if the minimum savings are not attained. Health plans may place participating disease management organizations at full financial risk if they are not meeting the program objectives and achieving cost savings that offset the administrative fee costs.

Future Implications

Disease management is a strategy that continues to be evaluated and assessed for its utility. Disease management programs have increased tremendously since the 1990s to address the growing population with chronic illnesses and its associated costs. The enhancement and growth of information technologies, evidence-based clinical guidelines,

and measurement systems have permitted the development of disease management programs. Some of the challenges that remain regarding disease management are demonstrating that these programs are actually effective in controlling utilization and costs and improving outcomes of populations with chronic conditions. The tools, technologies, and methods for disease management programs are becoming more sophisticated and hold much promise and potential for achieving this goal.

Jared Lane K. Maeda

See also Case Management; Cost of Healthcare; Disease; Evidence-Based Medicine (EBM); Medicaid; Medicare; Primary-Care Case Management (PCCM); Quality of Healthcare

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<http://www.dmaa.org>
- International Disease Management Alliance (IDMA):
<http://www.dmalliance.org>

National Governors Association (NGA): <http://www.nga.org>
 National Pharmaceutical Council (NPC):
<http://www.npcnow.org>

DIVERSITY IN HEALTHCARE MANAGEMENT

Diversity in healthcare management is important to the nation's healthcare system as a strategy to advance the effectiveness of healthcare organizations and help them achieve greater representation of underrepresented minorities in leadership, improve cultural competence, and decrease the ethnic and racial disparities that exist in the delivery of health services. There are many definitions of diversity. It has been defined as the total collective mixture, made up of "main" ones and "others"; it is not a function of race or gender or any other us-versus-them dyad but a complex and ever-changing blend of attributes, behaviors, and talents. Using this definition as a construct, the Institute for Diversity in Health Management (IFDHM) states that healthcare organizations represent all aspects of society, including—but not limited to—ethnicity, race, national origin, gender, age, physical ability, sexual orientation, religion, and family status. Healthcare institutions should be totally inclusive organizations, which value the differences in their staffs and recognize that diversity adds value to the organization, its mission, and the quality of its programs and services.

Background

In 1992, the American College of Healthcare Executives (ACHE), an international society of healthcare executives, and the National Association of Health Services Executives (NAHSE), an association of African American healthcare executives, conducted a joint study comparing the career attainment of their members. The study, titled *Racial Comparison of Career Attainment in Healthcare Management: Findings of a National Survey of African American and Caucasian Healthcare Executives*, documented that although African Americans and Caucasians had similar educational backgrounds and years of experience

in the field, African Americans held fewer top management positions, worked less often in hospitals, earned 13% less income, and were less satisfied with their jobs.

In 1997, the Association of Hispanic Healthcare Executives (AHHE) and the IFDHM joined ACHE and NAHSE to repeat the study, this time including their Hispanic and Asian members. The study found that ethnic and racially diverse managers earned less than their majority counterparts and felt that they received less respect than Caucasians from supervisors, received less autonomy in doing their work, experienced discriminatory acts in the workplace, and had to be more qualified than their majority counterparts to get ahead in their organizations.

In 2003, the survey sponsors conducted a follow-up study, and many of these findings revealed in the initial study remained present among ethnic and racially diverse managers. In contrast, the follow-up study showed that more than 50% of the Caucasian members did not feel that diversity and inclusion were issues and that improvements were not necessary concerning the lack of qualified minority healthcare leaders. Although some positive strides were observed nationally, it was estimated that less than 2% of all senior healthcare executives were ethnic or racial minorities.

Current Situation

The ranks of healthcare executives, physicians, pharmacists, laboratory technicians, and especially nurses are far less diverse than in the general population, and based on statistics from ACHE, American Hospital Association (AHA), and other healthcare associations, the mismatch is of staggering proportions. This means, among other things, a lack of role models and mentors for members of minority groups, a probable concern that the chances of advancement in healthcare are limited, and the strong possibility that some of the healthcare industries' "best and the brightest" will seek careers in other areas.

Caucasian men still disproportionately hold the top jobs in healthcare, and although this is a pattern common in almost all areas of American society, it has particularly negative implications for healthcare. For one thing, prospective healthcare leaders may be unwilling to commit to careers in a field that is unlikely to offer them the opportunity

to fulfill their potential. For another, succession planning will suffer if current healthcare organization leaders are not willing or able to broaden the pool of aspiring executives. In 2002, the IFDHM warned that many healthcare organizations were struggling with the fact that although they are very diverse in some areas—housekeeping, food service, and plant management, their leadership structure does not reflect the diversity in their own workforce. So when potential employees look for role models, there are none to be found, so they will look outside their own organizations for advancement. It is very important for those who want to be the provider—the employer—of choice to have diversity in leadership.

Future Implications

Societal trends and a rapidly changing demographic picture are forcing many healthcare organizations to realize that they will have to look for new insights, examples, and best practices to help them increase diversity. Frequently, they ask themselves questions regarding how an organization is to succeed in implementing a diversity program if it does not know how to build a business case for diversity. The business case for diversity is unique to each organization. The circumstance, environment, and community demographics of one organization cannot be generalized to another, and there is no one-size-fits-all solution. However, there are some common elements that should be present in designing a business case for diversity. The key components should include the healthcare marketplace, the available talent, and organizational effectiveness, which are all key drivers for the institutional investment in—and commitment to—diversity.

Successful organizations have learned that in today's very dynamic environment, diversity is a competitive advantage for their organizations. For example, the *Fortune Magazine* Top 100 Companies have found that people of color, including women, bring strategic input to their organizations and generate productive dialogue. Different ethnic and racial groups bring vital, diverse perspectives that help their companies succeed.

Rupert M. Evans

See also American College of Healthcare Executives (ACHE); American Hospital Association (AHA); Association of University Programs in Health

Administration (AUPHA); Ethnic and Racial Barriers to Healthcare; Health Workforce; Nurses; Physicians

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- Association of University Programs in Health Administration (AUPHA): <http://www.aupha.org>
- Institute for Diversity in Health Management (IFDHM): <http://www.diversityinc.com>
- National Association of Health Services Executives (NAHSE): <http://www.nahse.org>

DONABEDIAN, AVEDIS

Avedis Donabedian (1919–2000) is considered by many to be the father of quality assurance in healthcare. Donabedian is perhaps best known for his structure-process-outcome formulation for quality assessment of healthcare. His research and writing created much of the conceptual underpinnings for quality assessment used today.

Born in Beirut, Lebanon, in 1919 to an Armenian family, Donabedian earned a bachelor's degree in 1940 and a medical degree in 1944 from the American University of Beirut. For a while, he practiced family medicine in Jerusalem but eventually left for the United States. He received a master's degree in public health from Harvard University School of Public Health in 1955. After teaching at several universities, in 1961, Donabedian

joined the faculty of the School of Public Health at the University of Michigan as an associate professor of public health economics. In 1966, he was appointed professor of medical care organization, and in 1979, he became the Nathan Sinai Distinguished Professor of Public Health. He retired from the university in 1989, although he continued to consult, teach, and write.

Donabedian authored or coauthored 11 books and more than 100 journal articles. His seminal work was "Evaluating the Quality of Medical Care." In it, he introduced the concepts of structure, process, and outcome, which to this day make up the model used to evaluate the quality of healthcare. In the model, structure (e.g., number of hospital beds, staffing levels, physician licensing) lays the foundation for process (e.g., medical procedures and surgical operations), and process leads to healthcare outcomes (e.g., complication rates, death rates, length of stays).

Other important publications of his included a large, three-volume set titled *Exploration in Quality Assessment and Monitoring, Vol. 1: The Definition of Quality and Approaches to Its Assessment, Vol. 2: The Criteria and Standards of Quality, and Vol. 3: The Methods and Findings of Quality Assessment and Monitoring: An Illustrated Analysis*. His last book was *An Introduction to Quality Assurance in Health Care*.

Donabedian was a member of a number of prestigious professional societies. Specifically, he was a member of the National Academy of Sciences, Institute of Medicine (IOM); a fellow of the American Public Health Association (APHA); a member of the Association of Teachers of Preventive Medicine; and an honorary fellow of the American College of Hospital Administrators (now the American College of Healthcare Executives,ACHE).

He received numerous awards and honors for his work. The University of Michigan established the Avedis Donabedian Distinguished University Professorship in his honor in 2000. He was awarded the Sedgwick Memorial Medal for Distinguished Service by the APHA in 1999. The Avedis Donabedian Foundation for the improvement of healthcare was created in Barcelona, Spain, in his honor in 1989. He was awarded the Baxter American Foundation Prize for Health Services Research in 1986. He also received the first Richard B. Tobins Award from the American College of Utilization Review Physicians in 1984.

Ross M. Mullner

See also Codman, Ernest Amory; Joint Commission; Medical Errors; Outcomes Movement; Quality Indicators; Quality of Healthcare; Structure-Process-Outcome Quality Measures

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Web Site

Avedis Donabedian Foundation: <http://www.fadq.org>

DRUMMOND, MICHAEL

Michael Drummond is a well-known United Kingdom health economist and an expert in healthcare technology assessment. Drummond is a professor of

economics at the University of York and the former director of that university's Centre for Health Economics. He is a prolific writer on the economic evaluations of healthcare treatments and programs, including the following: care of the elderly, neonatal intensive care, immunization programs, services provided to people with AIDS, eye care problems, and pharmaceuticals.

Born in 1948, Drummond attended the University of Birmingham and earned a bachelor's degree in industrial metallurgy in 1970 and a master's degree in commerce and business administration in 1972. Drummond originally considered pursuing a doctoral degree in industrial relations. However, instead, he took advantage of a teaching opportunity in public-sector management at the University of Aston in Birmingham. While teaching a class in quantitative research administration, he became interested in the emerging field of health economics.

Drummond was a research fellow in health economics at the University of York from 1975 to 1978. He left to become a lecturer in health services management at the University of Birmingham. After receiving his doctoral degree in economics in 1983 from the University of York, Drummond became a visiting associate professor in the Department of Clinical Epidemiology and Biostatistics at McMaster University in Ontario, Canada. In 1984, he returned to the University of Birmingham as a senior lecturer and assistant director of the university's Health Services Management Centre. He served as the director of that center from 1986 to 1990. In 1990, Drummond accepted the position of professor of economics and became the director of the Centre for Health Economics at the University of York. He served as the director of that center until 2005.

Drummond has served as a consultant to a number of organizations, including the World Health Organization (WHO). He also was the project leader of the European Union Project on the Methodology of Economic Appraisal of Health Technology. Drummond also has served on the board of directors of the International Society of Technology Assessment in Health Care (ISTAHC) and was the president of the International Society for Pharmacoeconomics and Outcomes Research (ISPOR).

Drummond is a prolific researcher and writer. He has authored or coauthored two major textbooks

and more than 500 scientific journal articles on various topics. His most noted book is *Methods for the Economic Evaluation of Health Care Programmes*. He also serves on the editorial boards of a number of academic journals, including *Pharmacoeconomics*, *British Journal of Medical Economics*, *Journal of Evaluation in Clinical Practice*, and the *European Journal of Health Economics*.

In his long career, Drummond has received numerous awards and honors. In 2004, he was awarded the Avedis Donabedian Lifetime Achievement Award by the ISPOR—that organization's highest award. In 2008, he was awarded an honorary doctoral degree from the City University, London.

Currently, Drummond continues to work on the methods and practices of economic evaluations in healthcare. He also chairs a guidelines review panel for the United Kingdom's National Institute for Health and Clinical Excellence (NICE).

Amie Lulinski Norris

See also Cost-Benefit and Cost-Effectiveness Analyses; Health Economics; Pharmacoeconomics; United Kingdom's National Health Service (NHS); United Kingdom's National Institute for Health and Clinical Excellence (NICE); Williams, Alan H.

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University of York, Centre for Health Economics (CHE): <http://www.york.ac.uk/inst/che/staff/drummond.htm>

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ECONOMIC BARRIERS TO HEALTHCARE

Economic barriers to healthcare are economic or market-based factors that impede an individual's ability to access healthcare services. These barriers increase the costs associated with accessing healthcare and may prevent an individual from obtaining necessary preventive, chronic, or acute healthcare. Economic barriers to healthcare may ultimately increase the costs of care from both the individual and the societal perspectives by increasing the likelihood of an individual becoming ill, increasing the severity of illness, or both, thereby increasing the healthcare resources needed to treat the illness. In addition, by reducing the quality and quantity of care provided, they decrease an individual's stock of health capital. Common economic barriers include lack of access to health insurance coverage and other factors such as out-of-pocket costs and income, among others. Each of these barriers may interact with others such as ethnic and racial, and geographic barriers to healthcare, thereby further intensifying the challenges in accessing needed care.

Access to Health Insurance Coverage

While health insurance coverage is not the only economic barrier to healthcare services, it is one of the most important barriers in the United States, and it is closely tied to other barriers.

Access to health insurance coverage is driven by a number of factors—whether an individual is employed full- or part-time, whether an employer offers one or more health insurance plans, whether an individual qualifies for coverage through federal or state programs, such as Medicaid and the State Children's Health Insurance Program (SCHIP), the cost of health insurance premiums, as well as enrollee cost-sharing obligations.

Employer-Sponsored Health Insurance Coverage

In the United States, obtaining health insurance coverage through an individual's employer has historically been the most common mechanism for individuals under age 65, although employment is not a guarantee of coverage. When health insurance coverage is tied to employment, recessions and economic booms can have a significant impact on access to employer-based insurance plans for those who are employed due to the effect on labor markets (e.g., a shift between full- and part-time employment) as well as an employer's provision of health insurance coverage and its contribution to health insurance premiums. Health insurance coverage is a benefit provided to employees—in times of economic prosperity, robust health insurance coverage may be an important attraction to the firm; in times of economic downturn, employers may reduce health insurance coverage as a means to reduce costs.

Even when employed, individuals face barriers to accessing health insurance coverage. For lower-wage

earners, the cost of the health insurance premium may be unaffordable relative to the wages earned. Premiums for workers employed less than full-time are often higher than premiums for workers employed full-time. In addition, employers may have a waiting period before health insurance benefits are effective. Access to employer-sponsored health insurance coverage is an important enough benefit that it is not uncommon for individuals to choose to remain employed with a particular firm simply to maintain their health insurance benefits, and this close link between employment and coverage reduces job mobility.

In employer-sponsored health insurance, employers generally subsidize the cost of the premiums, such that employees bear only a portion of the total premium cost, and since employers may be able to better spread risk as well as have a healthier worker base than that in the general population, aggregate premiums may be lower than those available in the open market. Individuals who are self-employed can purchase an individual health insurance policy through the open market; however, they bear the full cost of the premium themselves. In addition, health insurance plans available through the open market often exclude or increase the cost of premiums for individuals with preexisting medical conditions or other risk factors. Even though options are available for self-employed persons, self-employment by itself is a barrier to accessing coverage.

Government-Sponsored Health Insurance Coverage

The federal and state governments offer health insurance programs in which individuals must meet specific eligibility requirements to enroll. It is a common misperception that all low-income individuals qualify for publicly provided health insurance coverage. While nearly all adults 65 years of age or older have access to Medicare coverage, individuals under age 65 have no guaranteed coverage in the United States. Several government programs provide coverage to narrowly defined groups of individuals without access to private health insurance coverage, but many individuals are not eligible for any of these programs. For example, individuals under age 65 with permanent disabilities may qualify for Medicare. However, Medicare eligibility is tied to the eligibility for

Social Security Disability Income benefits (SSDI). Disabled adults enrolled in SSDI must wait 24 months before receiving Medicare benefits, and SSDI has strict criteria for eligibility. Low-income disabled adults may also qualify for Supplemental Security Income (SSI) and Medicaid benefits, but again, these programs have stringent eligibility requirements.

Likewise, state programs such as Medicaid and SCHIP cover certain groups of low-income individuals, and eligibility is based on various requirements, including age; whether the individual is pregnant, disabled, or blind; income and assets of the individual; and whether the individual is a U.S. citizen or a legal immigrant. As a state-administered program, each state has its own eligibility and reenrollment requirements (e.g., reenrollment every 6 months, 1 year, or 2 years; passive reenrollment vs. active reenrollment), which serve as an additional barrier to accessing health insurance coverage. Although an individual gains coverage through a public program, it does not mean that he or she is indefinitely guaranteed coverage.

The Uninsured

Individuals without health insurance coverage experience the greatest barriers to accessing the healthcare system. While a safety net of public hospitals, community health centers, and hospital emergency departments exists, obtaining care through these venues is a challenge. While an individual's out-of-pocket costs at safety net providers are minimal, long wait times for medical or surgical services or to obtain medications remain significant barriers to care. Safety net providers may not have access to the newest and most advanced technology, further limiting access to high-quality care. In addition, service cuts by safety net hospitals as cost-cutting measures can eliminate access to certain types of care through these providers.

Other Economic Barriers

Out-of-Pocket Costs

The out-of-pocket costs of healthcare are an important economic barrier to accessing services, regardless of health insurance coverage. Uninsured individuals have historically been charged more

for healthcare services than those with health insurance coverage, due to the ability of health insurers to negotiate lower rates than those charged by healthcare providers.

Out-of-pocket costs remain a significant barrier for many with health insurance coverage. While premium costs are a barrier to accessing health insurance coverage, demand-side cost-sharing mechanisms also serve as an additional barrier to insured individuals, once they have coverage. Deductibles, coinsurance, and copayment amounts are designed to discourage unnecessary utilization, thereby reducing ex post moral hazard; however, they also may be a barrier to obtaining needed care.

Health insurance products that shift more risk to the individual enrollee, thereby increasing deductibles, coinsurance, and/or copayments, also increase barriers to healthcare. While premiums may decrease as more risk shifts to the enrollee, the trade-off with an increased risk is larger out-of-pocket payments when healthcare is obtained. While these products are designed to discourage unnecessary utilization, they also prevent some from accessing needed healthcare.

Income

While income is an important factor in whether individuals can afford to enroll in a health insurance plan through either their employer or directly in the open market or qualify for coverage through a public program, income serves as an additional barrier, independent of obtaining health insurance coverage. Income relates directly to an individual's direct ability to pay the out-of-pocket costs of healthcare services (or pay the coinsurance or deductible for healthcare services). In addition, income may be a barrier in accessing healthcare due to the travel costs associated with getting to a provider. While a sufficiently low income may help qualify some individuals for publicly provided health insurance coverage, other economic barriers related to having a low income may still prevent an individual from obtaining needed care.

Implications

The implications of these economic barriers that reduce access to healthcare services are enormous. These barriers—a lack of health insurance coverage,

high out-of-pocket costs, and low income—are associated with lower health status and an increased risk of mortality.

Second, when individuals delay necessary healthcare because of any of these factors, they have an increased likelihood of exacerbating their current medical condition, becoming ill in the future, and when ill, becoming more severely ill than those who obtain needed care on a timely basis. Delays in needed care ultimately drive up healthcare costs for both the individual and society more generally.

Third, barriers to appropriate primary and preventive healthcare services, such as a lack of preventive and primary-care providers in convenient locations with evening and weekend hours to serve working people, increase healthcare costs to the system, shifting costs to hospital emergency departments, which are often already overcrowded as well as a more expensive delivery setting. Similar effects occur with barriers to specialty and subspecialty care but may also increase the need for hospitalization.

Finally, delays in care that ultimately increase the total out-of-pocket amount paid by an individual may have a collateral effect of increasing medical debt, and this medical debt may serve as a barrier to accessing healthcare in the future, either because individuals do not want to seek care at a provider to whom they owe money or because the facility will not provide services until the debt is repaid.

Future Implications

Expanding health insurance coverage is not a guarantee of access to healthcare, nor is it the single solution to eliminating economic barriers to healthcare more broadly. Even with public insurance coverage, low-income individuals continue to face barriers to accessing the healthcare system. The availability of healthcare providers who accept patients with Medicaid or SCHIP coverage in some geographic areas, for example, limits access. In addition, even with public insurance coverage, having a low income makes it more difficult to travel to a provider and to the extent that lower-income individuals work in jobs that are less flexible, for example, they face greater financial costs when seeking medical care due to the need to take vacation or sick or unpaid time from work to see a healthcare provider. In addition, individuals with health insurance coverage face

increasing out-of-pocket costs for healthcare, which affects not only lower-income individuals but also those in the middle-income bracket.

Healthcare reform proposals aim to increase health insurance coverage to a larger group of individuals, either through a single-payer system or through a combination of private and public health insurance plans, and these plans may expand coverage, particularly for lower-income adults and children who did not previously qualify for federal or state programs and lower-income workers who could not otherwise afford healthcare coverage. While expanding health insurance coverage will reduce one barrier, other barriers will continue to persist without targeted interventions. Society is not one of limitless resources—healthcare costs have historically served as a mechanism to ration healthcare. Increasing health insurance coverage through the expansion of public programs, such as Medicaid and SCHIP, for example, to a broader range of low-income adults and children will increase coverage but does not guarantee access to care. Policymakers must also consider how to ensure an adequate supply of healthcare providers who are geographically distributed in order to provide easy access to enrolled individuals. The interrelation among economic and noneconomic barriers to care must be considered in concert to ensure that solutions to reduce one barrier do not exacerbate barriers to care in other ways. Changes to the financing of healthcare, for example, must be considered in light of the effects on access to care. When considered as a system, long-lasting solutions to these barriers can be designed and implemented.

*Tricia J. Johnson, Heather Forst,
and Anjali Kartha*

See also Access to Healthcare; Coinsurance, Copays, and Deductibles; Cost of Healthcare; Ethnic and Racial Barriers to Healthcare; Geographic Barriers to Healthcare; Health Insurance; Medicaid; Uninsured Individuals

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Web Sites

America's Health Insurance Plans (AHIP):

<http://www.ahip.org>

Center for Health Systems Change:

<http://www.hschange.org>

Commonwealth Fund: <http://www.commonwealthfund.org>

Henry J. Kaiser Family Foundation (KFF):

<http://www.kff.org>

U.S. Census Bureau: <http://www.census.gov>

ECONOMIC RECESSIONS

Economic recessions periodically occur in all the world's economies. Despite the importance of recessions, there has been relatively little conclusive research conducted on their impact on a population's health and healthcare providers. Those few researchers who have studied the issue tend to break into two camps. In the one camp, economists and public health researchers argue that recessions and health are countercyclical; that is, as the economy deteriorates, more individuals become ill and seek out healthcare services thereby placing a strain on healthcare providers. In contrast, researchers in the other camp argue that recessions and health are procyclical; that is, as the economy deteriorates, fewer individuals have the economic resources to pursue unhealthy behaviors such as overeating, smoking, and consuming

alcohol, which lead to improved health and decreased healthcare utilization. Both camps study the issue by focusing on mortality data and/or healthcare utilization data.

Definition of Economic Recession

Economic recession is defined in macroeconomic theory as two or more calendar quarters of consecutive decline in a nation's gross domestic product (GDP). The National Bureau of Economic Research (NBER) more broadly defines recession as a significant decline in economic activity spread across the economy, lasting more than a few months. Recession may also have accompanying declines in employment rates, among other measures of a nation's economic health such as business profitability, stock market performance, and inflation.

Definition of Health and Healthcare Measures

The study of economic recession effects on a population's health includes the analysis of aggregate health outcome statistics, such as the overall population mortality and disease-specific mortality and morbidity. Most researchers have studied the relationship of unemployment and population health using mortality data, while few have studied the relationship of unemployment and morbidity.

Mortality and Morbidity

Mortality, a commonly used public health index, is a very crude measure of the health of a population. The crude death rate is calculated as the total number of deaths in a year for a geographic area divided by the average midyear population expressed per 1,000 people. There are many ways to refine mortality rates, including adjusting for the population's age (age-specific death rate), causes of death (cause-specific death rate), and the period around birth (e.g., infant mortality rate, neonatal mortality rate, maternal mortality rate).

In the study of morbidity, defined as the relative incidence of disease, the earliest attempts by

government to investigate disease occurrences were related to the need to contain serious infectious diseases, such as smallpox, diphtheria, and yellow fever. To this was added the goal of studying the distribution of diseases. In their focus on patients as individuals, practicing physicians are likely to be relatively unconcerned with their role in contributing to a community-wide network of information about disease. However, through the use of medical billing data, the incidence of disease across networks can be determined as patients present to healthcare facilities. Morbidity can therefore be analyzed by studying utilization of healthcare services and can be a useful measure of the effects of unemployment on a population's health over time.

Healthcare Utilization

The analysis of the effects of economic recession on the utilization of healthcare services generally focuses on inpatient hospitalization but may also include an analysis of outpatient services. Inpatient hospitalization (generally defined as an overnight stay in a hospital for more than 24 hours) analysis is more common given that data are uniformly and consistently gathered by hospitals through federal requirements for participating in the Medicare program. Data are captured in a uniform billing (UB) data set made available to researchers and practitioners typically through state public health departments or hospital associations. Outpatient data are less reliably captured and inconsistently reported on and therefore are not well suited for health services research.

Health Problems and Economic Recession

One of the first researchers to study the relationship between unemployment and health in the United States was M. Harvey Brenner. In the late 1960s, Brenner studied the effect of economic change on the patterns of psychiatric hospitalizations and psychopathological conditions in general. He initially studied the effects of economic change on the mental hospitalization levels of various socioeconomic groups. Brenner found that it was not necessarily the traditional poor alone who became psychiatric victims of precipitating economic stress—under sufficient economic

pressure, members of all socioeconomic stratum responded in terms of mental hospitalization. Hospital utilization—a surrogate for the incidence of disease or morbidity—in the larger population, therefore, increased during times of increasing unemployment and declining gross domestic product growth. As unemployment increased, the incidence in job-loss related stress and macroeconomic stressors increased, thereby increasing the utilization of mental health services.

Economic recession appears to increase the probability of a variety of losses and social changes that potentially threaten health in at least three ways: Poverty or lack of material resources to meet the ordinary requirements as well as the extraordinary problems of life can affect many of the unemployed and others who experience financial loss; the psychological stress associated with financial loss is potentially damaging itself, especially if it leads to withdrawal and the loss of potentially beneficial relationships; and attempts to alleviate psychological distress by medicating with alcohol or legal and illegal drugs, by overeating or under-eating, or by smoking tobacco will tend to exacerbate existing morbidity and produce additional health problems.

In a more recent mental health example, there is an emerging area of research related to the post-9/11 terrorist attack on New York City's World Trade Center and healthcare utilization. In a public health phenomenon that may be described as posttraumatic stress, for weeks after the attack, residents in New York City and other cities in the nation went to hospital emergency departments in increasing numbers with stress-related diagnoses.

Health Benefits and Economic Recession

Recent research conducted by Christopher J. Rhum and others suggests that health may actually improve during times of increasing unemployment and declining GDP growth. The driving macroeconomic theory is that during times of economic expansion, as relatively more consumers enjoy larger amounts of disposable income, consumers assume greater amounts of risk-associated buying behavior. Examples include purchasing luxury automobiles, smoking, and consuming alcoholic beverages. When this phenomenon occurs, the incidence of health-related problems

associated with the risk behavior increases. So, for example, as more consumers smoke because they have the resources to do so, the incidence of lung-related cancers increases over time. Or, similarly, as more people consume more alcoholic beverages and drive automobiles, the incidence of motor-vehicle-related fatalities increases.

In this relationship, the total mortality rate, age-specific mortality rates, as well as most specific mortality causes are procyclical or increase during times of economic expansion. Fixed-effect models are estimated using longitudinal data, with health proxied by total and age-specific mortality rates and 10 specific causes of death. The 10 causes of death included cancer (malignant neoplasms), heart disease (cardiovascular diseases), pneumonia and influenza, chronic liver diseases, motor vehicle accidents, suicide, homicide, other accidents, neonatal mortality (death within 28 days after birth), and infant mortality. These 10 conditions accounted for approximately 80% of all mortality in the United States, on average. In addition, microdata from the Behavioral Risk Factor Surveillance System (BRFSS) were used to examine how risky behaviors and time-sensitive health investments in physical activity, diet, and preventive medical care vary with the status of the U.S. economy.

It was found that health improves when the economy temporarily declines—state unemployment rates are negatively and significantly related to total mortality in 8 of the 10 specific causes of mortality, with suicides representing an important exception. The variation in death rates is strongest for those causes and age groups where fluctuations are most plausible, and there is some evidence that the unfavorable health effects of temporary upturns in the economy are partially or fully offset if the economic growth is long lasting. Consistent with these results, the microdata revealed that joblessness is associated with reduced smoking and obesity, increased physical activity, and improved diet. The number of medical problems, the prevalence of acute morbidities, and the number of reported inpatient bed-days decreased during economic recessions. A 1-percentage-point rise in a state unemployment rate, relative to its historical average, is associated with a 0.5% to 0.6% decrease in total mortality; Rhum therefore concludes that economic recessions are “good for your health.”

Effects of Health Insurance on Economic-Related Mortality

There are differences across social insurance systems where stronger procyclical fluctuations might occur in nations with relatively weak social protections if individuals have incentives to work particularly hard during good economic times to offset the effects of reduced incomes during downturns. Conversely, an employment-based system of health insurance, such as in the United States, may imply higher rates of insurance coverage during macroeconomic expansions. It has been shown that procyclical fluctuations in mortality are much stronger in nations with weak social insurance programs. These results occur despite a protective effect of income, which, not surprisingly, is more pronounced in nations with weaker social safety nets.

The Underemployed

There is another group that is affected by economic change—the underemployed. Underemployment is defined as the condition in which people in a labor force are employed at less than full-time or regular jobs or at jobs inadequate with respect to their training or economic needs. Most studies on the relationship between unemployment status and health have contrasted just two conditions, employment versus unemployment. Because the underemployed share some of the more stressful features of unemployment, such as decreased income, status, or time structure, it seems plausible that they could produce adverse effects on health similar to those reported for unemployment.

Future Implications

The question of whether health and healthcare utilization is influenced by economic fluctuations is of significant interest from a number of perspectives. The importance of clarifying the relationship between economic recession, individual health, and the health of populations is foremost among them. It is possible that a recession lowers the mortality risk for some individuals while worsening the health status of other individuals, but short of increased mortality. This need not contradict the

evidence for the negative effects of unemployment on some health aspects for at least some people. The public-policy implications of the research indicate a focus on how the negative impact of economic upturns on mortality rates can be mitigated, if not avoided. These questions have profound implications for the development of national policies that influence economic expansion/recession and, by relation, those that influence the health of the population. Clarifying the relationship between economic downturn and the effect on the healthcare delivery system as a whole is also of utmost importance. If patterns of healthcare utilization change as a result of economic recession, healthcare delivery systems must adjust to meet either increasing or decreasing demand for services.

Although the evidence is far from conclusive, recent research appears to show that there is a procyclical relationship between recession and health and that mortality decreases during economic downturns. However, much more research needs to be conducted to address the specific relationships for particular diseases and various population groups, including those who are insured, underinsured, and underemployed.

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See also Access to Healthcare; Community Health; Economic Barriers to Healthcare; Epidemiology; Health Economics; Morbidity; Mortality; Public Health

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Bureau of Labor Statistics (BLS): <http://www.bls.gov>

Centers for Medicare and Medicaid Services (CMS):
<http://www.cms.hhs.gov>

National Bureau of Economic Research (NBER):
<http://www.nber.org>

National Center for Health Statistics (NCHS):
<http://www.cdc.gov/nchs>

ECONOMIC SPILLOVER

Economic spillover, also referred to as an externality, is a cost or benefit that is created by an individual or a firm that also affects other parties in a way that is not captured by the price, or that spills over to other consumers or producers. Economic spillover is often classified as either a consumption or a production externality. A consumption externality is associated with the consumption of a good or service that creates costs or benefits for other members of society, and a production externality is associated with the production of a good or service that creates costs or benefits for other members of society. Externalities may be positive, generating benefits for other consumers or producers, such that the societal benefits of the transaction are greater than the private benefits borne by the producer or consumer. They may also be negative, generating costs for other consumers or producers, such that the societal costs are greater than the private costs borne by the individual producer or consumer.

Examples of Externalities in Healthcare

General Examples of Externalities

Examples of externalities abound in the healthcare market. The market for immunizations is one example of a positive externality. While an

immunization prevents or reduces the risk of an individual contracting a disease, it has an additional benefit of protecting the immunized individual from spreading the disease to other members of society. When an individual makes a decision about whether to obtain an immunization, however, he makes this decision based on his marginal cost of the immunization compared with his marginal benefit of preventing himself from contracting the disease. Because spreading the disease to others bears no cost to the individual, it is not a factor in his decision. From the societal perspective, too few people will obtain immunizations if they bear the full cost.

An example of a negative externality relates to smoking. Smoking generates secondhand smoke, which imposes health costs on others. The smoker, however, does not bear the health costs borne by others. Another type of consumption externality exists if one individual's utility or satisfaction depends on another individual's utility. Individuals may, for example, benefit from knowing that everyone in society has access to healthcare.

Medical education provides another positive externality to society, because a community benefits from the human and health capital generated by physicians. Medical education is often heavily subsidized. For example, Medicare subsidizes teaching hospitals through graduate medical education and disproportionate share payments, decreasing a teaching hospital's marginal cost of training residents and ultimately increasing the number of residents trained.

Research and Development

Research and development also generate externalities in society. Research increases the overall level of knowledge in society, and often, the results of research created by one individual or firm are freely used by other entities. Without government grants and subsidies to encourage research and development, too little research would likely be generated, since the individual or firm creating the new knowledge does not reap all the benefits of the research.

Problems With Externalities

Externalities are a concern for healthcare, because they can result in a market failure, a situation where too many or too few goods or services are produced relative to the socially optimal quantity.

Consumers and producers make decisions based on their own private costs and benefits, not the societal costs and benefits that accrue to others. Without market interventions, the quantity of a good or service with significant externalities will not be socially optimal. That is, too much or too little of the good or service will be produced.

With a positive externality, consumers or producers will underconsume or underproduce the good or service, since their decisions fail to take into account the societal benefits due to spillover to others in the market. Similarly, with a negative externality, consumers or producers will overconsume or overproduce the good or service.

Solutions to Externality Problems

Externalities exist because of the lack of well-defined property rights. With smoking, smokers claim that they have the right to smoke, while nonsmokers claim that they have the right to clean air. The government may step in and assign property rights to one party or another. In the city of Chicago, for example, an ordinance was passed that bans smokers from smoking in restaurants and bars, assigning property rights to nonsmokers (i.e., the right to clean air while dining in a restaurant).

In addition to the government assigning property rights, another common solution in healthcare is to develop mechanisms for the externality to be “internalized,” where the consumer or producer incorporates the external costs or benefits into the private costs or benefits. Taxes and subsidies as well as patents are common strategies to internalize the social costs or benefits. With positive externalities, producers or consumers may be given a price subsidy to increase the marginal benefit of producing or consuming the good, paid by those who receive a benefit from the externality, and increasing the quantity bought and sold. Likewise, one solution to negative externalities is to tax the producer or consumer of the externality, increasing the marginal private cost of producing or consuming the good or service that generates the externality. It is important to note, however, that a tax levied on the producer generally is not borne entirely by the producer but instead is shared by the producer and consumer. The price elasticities of demand and supply determine the proportion borne by each party.

A large number of positive and negative externalities have existed and will continue to exist in healthcare. While an externality can lead to market failure, a situation where goods or services are not allocated efficiently, solutions exist to mitigate these challenges when the externality is sufficiently large.

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See also American Society of Health Economists (ASHE); Health Economics; International Health Economics Association (iHEA); Market Failure; Public Health; Tobacco Use

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- American Society of Health Economists (ASHE): <http://healthconomics.us>
- International Health Economics Association (iHEA): <http://www.healthconomics.org>
- World Health Organization (WHO): <http://www.who.int>

ECONOMIES OF SCALE

The notion of economies of scale in the production of healthcare goods and services is central to understanding competitive forces, the diffusion of medical

technologies, the quality of care, and regulation in the healthcare industry. Economies of scale are present when larger-scale operations lead to reductions in average operating costs. Likewise, if an increase in cost due to an increase in all inputs causes the output to rise more than proportionally, economies of scale are said to exist.

A distinction is made between internal and external economies of scale. When a company's production process is such that as the number of units produced rises, the average cost of each unit falls, internal economies of scale have been achieved. In contrast, external economies of scale occur outside a firm, within an industry. For example, sharing technology, managerial expertise, and the creation of industry standards of healthcare may lessen the burden of costly inputs. It is important to note that economies of scale can exist with respect to the physical quantity of a good, the number of patients served, or the quality of the good or service.

Economies of Scale in Healthcare

There are several avenues through which economies of scale are achieved. These include the following: high fixed costs of production, improved bargaining power for inputs, organizational design, coordination, and specialization. These factors and their applicability to the healthcare industry are discussed below.

Hospitals

Economies of scale are most likely to be found in industries with large fixed costs in production. Fixed costs are those costs that must be incurred even if production were to drop to zero. In the extreme case, high fixed costs could lead to a natural monopoly situation, in which the most efficient (least costly) market structure would be to have only one firm providing a particular kind of good or service. In the long run, economists expect only one firm to "naturally" survive even in the absence of legal regulations. Yet, in a world where the rate of technological change is extremely high, one cannot rule out a situation in which multiple firms are providing the good or service; even this would be less efficient than a single firm providing the good or service. This is part of the rationale behind

states' certificate of need (CON) laws, designed to contain costs by avoiding extensive duplication of services and redundant hospital capacity.

Studies investigating the possible existence of economies of scale in hospitals find mixed results. In part, this could be related to the large variety of services offered by individual hospitals or to demand conditions, such as transportation costs, that limit the economies of scale that can be realized. However, studies that focus on individual services characterized by high fixed costs, such as open-heart surgery facilities, CT scanner units, and therapeutic radiology facilities, often find evidence of economies of scale.

Scale economies are not limited solely to providers. Payers face long-run average costs, which incorporate capital, and other fixed set-up costs. High start-up costs in the insurance industry require many subscribers to cover those costs. The flip side is, of course, that high set-up costs represent barriers to entry, which inhibit competition. Firms in industries exhibiting economies of scale therefore tend to have market power.

Economies of scale are among the economic benefits that hospitals can reap by joining multi-hospital healthcare systems relative to being free-standing facilities. Some of these cost advantages stem from improved access to capital, while others are the result of better bargaining power versus insurers, referring physicians, and patients. Larger companies can buy supplies in bulk and centralize administrative functions as well as training and maintenance. With a larger scale of production, a company may also apply better organizational skills to its resources—such as hospitalists, physicians who specialize in the management of patients who are hospitalized. Clinical studies show that hospitalists helped contain hospital costs without compromising on quality of care.

Group Practices

Similarly, group medical practices have occasionally been touted as organizations that should yield considerable economies of scale and thus help raise output while moderating total costs. Taking advantage of scale economies may explain the shift from sole to group practice. By pooling inputs such as offices, equipment, and administrative resources, physicians could increase their productivity while lowering their costs.

Technology

Finally, the notion of economies of scale, which speaks to the behavior of costs, is closely related to the notion of returns to production, which describes technology. For example, if a technology exhibits increasing returns to production, doubling inputs will more than double output. Since doubling inputs doubles the cost, average costs (i.e., cost divided by output) will fall, hence economies of scale are achieved.

Volume-Outcome Relationship

The division of labor and specialization are two key means of achieving increasing returns to production. This is especially important in healthcare, where, to improve the skills necessary to perform their jobs, physicians and other healthcare professionals need to concentrate on a narrow set of specific tasks. These tasks can then be performed better and faster. Hence, through such efficiencies, time and money can be saved and production levels increased.

For instance, there is evidence of lower mortality rates in hospitals that perform more of a given procedure. This may be a demand phenomenon, whereby high-quality hospitals attract more patients, or a supply phenomenon, whereby quality-enhancing scale economies cause large hospitals to provide better quality of care. Therefore, scale economies can arise at the individual physician level, as learning-by-doing affects the cost structure the individual hospital faces.

The proponents of specialty hospitals, for example, assert that their “focused factory” approach enables these facilities to enjoy positive returns to experience in the production of quality, thus leading to improved efficiency and outcomes along with reduced costs.

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See also Certificate of Need (CON); Focused Factories; Health Economics; Hospitalists; Medical Group Practice; Multihospital Healthcare Systems; Volume-Outcome Relationship

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International Health Economics Association (iHEA):
<http://www.healthconomics.org>

E-HEALTH

E-health is a broad term for the diverse, evolving digital resources and practices that support health and healthcare, with the Internet and its applications at its core. Definitions of e-health vary greatly depending on its uses, stakeholders, and target areas. Some researchers define e-health as the use of emerging information and communication technology, especially the Internet, to improve or enable health and healthcare. Other researchers use a broader definition, defining e-health as including medical informatics, public health, and business, referring to health services and information delivered through the Internet and related technologies. In a broader sense, the term characterizes not only a technical development but also a state of mind, a way of thinking, an attitude, and a commitment to networking and global thinking.

Background

The e-health revolution was ignited by the advent of Internet technology and its numerous ramifications

in the late 20th century, along with the recognition of the advantages to adapting and adopting it in healthcare delivery and research. It encompasses applications in the domains of public health, preventive medicine, patient diagnosis, management and care, consumer-oriented health awareness, healthcare business management, professional clinical informatics, electronic clinical records, consumer health informatics, and health policy formulation and implementation. E-health is an effective, fast, and convenient medium for local and global education and communication on health, healthcare delivery, health administration, and health policy issues. The backbone of e-health is a combination of the computer and the Internet, along with a number of technologies dependent on—or related to—their use, including, but not limited to, interactive communication via the World Wide Web, satellite connections, digital TV, health kiosks, wireless networks, palm technologies, CD-ROMs and DVDs, virtual reality (i.e., for remote/intercontinental surgery), and nanotechnology.

Numerous stakeholders are involved in e-health supply and use: consumers, advocacy and not-for-profit health organizations, community-based organizations, healthcare organizations such as hospitals and clinics, the health insurance industry, healthcare administrators, clinicians, developers and suppliers of e-health applications, public health programs, and public and private health policymakers and funders. The main purpose of e-health is to provide more efficient, cost-effective, convenient, interactive, interconnected, evidence-based services that benefit all parties involved.

Most e-health tools are designed for specific functions serving defined groups of people at the individual, organizational, or population level, with some overlap. Personal health functions may include the provision of health information, promotion of behavior change or prevention strategies, provision of resources for self-management of health, and formation of online communities and support groups. In healthcare provision and administration, tools are used for disease management, decision-making support, personnel and financial management, maintenance of electronic clinical records, transmission and sharing of health data and reports, and creation of interconnected networks that streamline healthcare delivery in a cost-effective manner.

Uses

E-health is not confined to healthcare delivery; it also applies to public health governance, finance, education, research, and health-related economic activities. Electronic media are increasingly used for dissemination of information for public health promotion and awareness, medical education, promotion of biomedical research and evidence-based medicine, and e-learning for healthcare professionals. Health information systems are used in disease surveillance; for maintaining databases for research and administration; and in financial, management, monitoring, evaluation, and logistical applications pertaining to healthcare. In health research, electronic databases such as population registers have galvanized epidemiological research, with immense value for health policy formulation. Informatics tools are used to guide the selection of appropriate and cost-effective priorities for policymakers. Geographical information systems are gaining popularity as tools for spatial projection and mapping of health concerns to help in making policy decisions and targeting outreach initiatives. In the field of clinical medicine and patient care, e-health has made enormous strides, particularly in developed nations, where capacity exists to support such applications. Healthcare delivery technologies support diagnostics, health decision support systems, treatment, electronic clinical communications tools (e-bookings, referrals, and discharges), electronic networks, telemedicine, teleconsultation, telesurgery, robotic surgery, and electronic medical records, among other rapidly expanding options. The pharmaceutical and nursing fields are also using systems tailored to their needs.

In the field of health education (e-learning), e-health technologies have opened up avenues for instant global exchange of health information and education at little cost. This has enabled developing countries to access evidence-based health interventions and research in order to guide their own programs for improving population health. Applications include tools for cognitive learning, computer-aided instruction and training, continuing education, and distance learning. The creation of digital libraries has revolutionized health research and learning by bringing expensive books and journals into the home and office at little or no

cost. The creation of digital knowledge bases and online dissemination of health education has broad-reaching applications in the public health sector as well as in consumer health education.

The concepts of consumer e-health and personal health management are being promoted by health policymakers and thought leaders to enable people to be responsible for their own health, signifying a shift away from the traditional paternalistic pattern of healthcare delivery. As these technologies are becoming more widespread, more people are using them to make informed, independent decisions on how, when, where, and why to access healthcare that is convenient, reliable, and affordable or to adopt healthy behaviors. The most common tools are personal health records, patient portals, and secure patient-physician e-mails. These can become important tools in promoting personal, community, and population health.

Interactive health communication (IHC) allows individuals with an electronic device or communication technology to access, transmit, or receive health information, treatment guidance, or support on an issue related to their health. This consists mostly of Web sites or technology-mediated applications that promote self-care and healthy behaviors, enable individuals to make informed decisions on health issues, promote exchange of information, or allow remote access to physician care. The application permits improved individual access to specific health information, gives wider choice in seeking and comparing treatment options, promotes user anonymity, and supports wider group involvement in health concerns and advocacy. Another advantage is the capacity for instant updates on recent advances. However, research on the quality or effectiveness of such approaches is still in its infancy. Preliminary research has revealed a low level of use and significant disparities in access to the socially disadvantaged and in ethnic and racial minorities, even if access is similar. Possible explanations for these disparities in use include differences in the quality or speed of the Internet connection; the perception of e-health as a valuable health tool; cultural preferences; wariness of the trustworthiness and privacy of sites; and the typical lag time in diffusion of innovations. Lack of reliability of sources is a cause for serious concern. Additionally, most IHC systems in the healthcare arena are provider

oriented, so a shift to providing consumer-friendly applications may portend a wider adoption of health technologies.

Healthcare business intelligence and predictive modeling are important applications of e-health. E-health provides support to clinical, financial, budgetary, and forecasting decisions based on realistic and accurate predictive modeling. It enables a self-service type of reporting for external and internal clients and organizations. In the public health sector, systems are used to evaluate population health status and develop, disseminate, and evaluate health promotion and disease management interventions. For example, applications provide HEDIS (Healthcare Effectiveness Data and Information Set) quality and performance measurements for various public health programs and insurance companies. They can be used for conducting cost-benefit analysis of alternative strategies and helping choose the best option. Technology is used extensively in maintaining data warehouses for health statistics that guide health policy and planning in both the public and the private sectors. Software is used that enables accurate and credible budgeting and forecasting based on actual, predicted, and adjusted measures of utilization and costs; reduces fraudulent or inappropriate claims billing and eligibility; and can be used for predicting future requirements and shortfalls. Excellent tools are available for human resource management in the healthcare arena, and they are increasingly being used to improve efficiency and cost savings.

Telemedicine

Telemedicine, the first and oldest form of e-health, is the interface of medicine and information and communication technologies for delivery of healthcare services where distance is a critical factor. Telemedicine applications are making rapid strides in the fields of emergency healthcare, homecare, patient telemonitoring and a variety of clinical fields such as teleradiology, -cardiology, -pathology, and -surgery. They are used to provide fast and convenient expert medical services locally, nationally, and globally, enabling two-way transmission of patient-provider information and images that permit patient or physician access to remote experts to enable prompt diagnosis and timely treatment in rural health centers, remote

areas, and inaccessible geographic locations, apart from facilitating homecare. Teleconsulting is a corollary that allows experts to consult each other or advise physicians in remote areas. Telesurgery and robotic surgery are state-of-the-art techniques that allow surgeons to perform remote-controlled procedures or guide surgeons from a distance in conducting innovative or emergency procedures. Remote satellites enable the global use of these systems.

A wide variety of services fall under the umbrella of telemedicine services: specialist referral services, patient consultations, remote patient monitoring, medical education, and consumer medical/health information. Specialist referral services usually involve a teleconsultation between one or several specialists and/or a general physician to arrive at a correct diagnosis and treatment. More than 50 specialties are successfully using it to provide local or global patient care. Patient consultations are direct, remote interactions between the patient and the health professional in which reports and other health data are interchanged to guide treatment. Remote patient monitoring, or home telehealth, transmits and collects data from remote stations (e.g., an ECG or pulse recording), usually via the Internet, which is useful in controlling the use of visiting nurses.

Delivery Mechanisms

Several types of delivery mechanisms are used in e-health: networked programs, point-to-point connections, primary or specialty care to the home, home monitoring, and Web-based e-health patient or consumer services sites. Dedicated networks link health organizations with their partners, subsidiaries, or health centers in remote areas and are used primarily for administrative purposes. Their use in public health programs is growing as e-health becomes more popular. Point-to-point connections usually link private providers such as hospitals to patients requiring telehelp or teleconsultation. Primary or specialty care to the home connects physicians and visiting nurses with patients over single-line telephone-video systems for interactive clinical consultations. Home-to-monitoring-center links are useful for remote monitoring of lung functions, fetal heart monitoring, or cardiac monitoring for patients needing extensive surveillance at home.

Only those Web-based e-health patient service sites that provide direct patient communication fall under the purview of telemedicine.

E-Health Terminology

Store-and-forward transmission of still digital images or clinical data is frequently used in radiology, dermatology, and pathology. A digital camera is used to store and transmit relevant patient pictures. *Originating site*, also known as spoke site, patient site, remote site, and rural site, is defined by the Centers for Medicare and Medicaid Services (CMS) as a site where the patient and/or the patient's physician is located during the telehealth encounter or consult. A *patient presenter* is someone with clinical skills, such as a nurse, who is trained in the use of the camera equipment and who is in attendance with the patient at the originating site to "present" the patient, manage the camera, and perform any hands-on activities requested by the remote physician to arrive at a diagnosis. A trained presenter is not necessary in all cases, as in radiology or pathology consults. *Bandwidth* signifies the capacity of a communications channel to transmit information. Broadband communications carry a wide range of frequencies that permit simultaneous transmission of several messages, as in broadcast TV and satellites. Interactive video/television permits two-way, synchronous, interactive video and audio signals to deliver e-health services: ITV, IATV, or VTC (video teleconference) are commonly used acronyms. *Firewalls* are computer hardware and software that block communication channels between an institution's computer network and unauthorized external networks.

E-Health Ethics, Confidentiality, and Safety

The ethical and legal safety norms of e-health are still not well-defined. Ethical issues cover the preservation of confidentiality, dignity, and privacy. Legislation guaranteeing these values is essential, along with liability for misuse, for all providers of e-health information. The Internet is a particularly difficult tool to control in the absence of well-defined ownership or accountability regulations that can control cyberspace activities. The unrestricted

proliferation of e-health sites has led to the release of health information that may often be undocumented, misleading, influenced by monetary or business reasons, and potentially harmful to consumers. Consumers need to be made aware of the pitfalls of using or providing personal health information to sources that do not originate from reliable sites. All users of e-health may not be able to discriminate between reliable and unreliable information, particularly as related to drugs and supplements, and may suffer from considerable personal and economic harm.

Digital Divide

The *digital divide* is the term used to describe the disparity in access to e-health tools between the rich and the poor. Most people who suffer from higher rates of preventable diseases and risk factors for those diseases have limited access to healthcare. They are also likely to have little or no access to e-health technologies, both because of economic reasons and because of the inability to understand and use these technologies even if they are made available. This is particularly true for disadvantaged populations such as the elderly, those with low literacy, people with disabilities, those who are computer and/or health illiterate, and immigrants. Public health policymakers need to seriously consider this divide while making policy decisions to divert precious funds to adopting technologies that may not benefit the underserved.

Barriers

E-health is an evolving tool that is expensive to install initially, though some systems have proved to be cost-effective over time. Research is ongoing as more organizations discover the advantages of e-health and are adopting its technologies. However, the provision of e-health that is user-friendly and accessible to all is fraught with problems. Demographic, sociocultural, economic, and linguistic barriers exist in designing e-health tools for public consumption. To use such tools, people need access to hardware, software, and an Internet connection, along with the ability to navigate the system, understand its content, and use it effectively, often described as *meaningful access*. In a multilingual society with limited health literacy, as

is common both in the United States and globally, the development of consumer-oriented tools and provision of infrastructure require the involvement of a number of stakeholders and the creation of multiple tools to ensure equitable access. As e-health is essentially a multidisciplinary tool, conflicts occasionally arise between stakeholders in deciding the best technology or software to adopt, as health is primarily a social responsibility while technology is business oriented. Besides, creating networks involves coordinating several organizations with different levels of needs, training staff in managing such systems, and overcoming economic restraints, in addition to dealing with vendors who may not be familiar with the specific demands of healthcare delivery. A thorough needs assessment involving all stakeholders is necessary before adopting such technologies. Globally, the majority of people will be unable to use e-health services because of socioeconomic reasons for many decades to come, thus increasing the health disparities.

Future Implications

In a world governed by information and communication technology, channels of e-health technology have opened up new avenues in the delivery and management of healthcare. An increasing number of decision makers in the public and private healthcare sectors are looking at e-health tools to deliver innovative ways for healthcare reform and improving personal and population health. These tools possess the potential to reduce costs, improve efficiency and quality of care, provide wide access to healthcare and education, and improve the overall capacity of healthcare organizations. However, the arena of healthcare has been slow in adopting these technologies, partly because of the various sociocultural factors that govern health as compared with the business sector. Much progress can be made in adopting e-health strategies that are efficient and cost-effective. The emphasis should be on using an interdisciplinary approach that addresses the diversity of healthcare delivery and management at all levels.

*Karen E. Peters, Sunanda Gupta,
and Benjamin C. Mueller*

See also Computers; Electronic Clinical Records; E-Prescribing; Healthcare Web Sites; Health Communication; Health Informatics; Health Insurance Portability and Accountability Act of 1996 (HIPAA); Health Literacy

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- eHealth Institute: <http://www.ehealthinstitute.org>

EISENBERG, JOHN M.

John M. Eisenberg (1946–2002), an early leader in the Society for Medical Decision Making, was a general internist whose early grasp of the importance of economic and other nonmedical factors in clinical decision making fueled an exceptional career that included national leadership in medicine, medical decision making, health economics, public policy, and health services research. In addition to his own career accomplishments, Eisenberg was also renowned as one of the foremost leaders in general internal medicine and a lifelong mentor of students and professionals in multiple disciplines.

Born in Atlanta, Georgia, and raised in Memphis, Tennessee, Eisenberg received his undergraduate degree from Princeton University (1968) and his

medical degree from Washington University School of Medicine in St. Louis (1972). He trained as an internist at the University of Pennsylvania and was one of the first cadres of Robert Wood Johnson Clinical Scholars, which allowed him to receive a master of business administration degree in 1976 from Wharton School, University of Pennsylvania. From 1978 to 1991, Eisenberg served as the chief of the Division of General Internal Medicine at the University of Pennsylvania, which he made one of the top divisions of this discipline in the nation. In 1991, he was one of the first general internists selected to chair a department of internal medicine, and he served in this capacity at Georgetown Medical School until 1997, when he became Administrator of the Agency for Health Care Policy and Research (AHCPR), later known as the Agency for Healthcare Research and Quality (AHRQ). In this last position, he also served as assistant secretary for health.

In addition to numerous academic achievements, Eisenberg's expertise on the impact of financial incentives on physicians' decisions led to his serving as a member in and then chairing the Congressional Physician Payment Review Commission (PPRC) from 1986 to 1994. He was the first physician president of the Society for Medical Decision Making, and he also led the Society for General Internal Medicine, the Association for Health Services Research, and served on numerous editorial boards and federal peer review groups.

Eisenberg's scientific contributions were extensive and included a strong focus on multiple dimensions of clinical decision making, including diagnostic uncertainty, cost-effectiveness and cost-benefit analysis, and sociological influences on physicians' decisions—such as the impact of the patient's race, ethnicity, and gender. His book *Doctors' Decisions and the Cost of Medical Care* was a seminal contribution to the fields of medical decision making and health economics.

In his final position, leading what is now the AHRQ, Eisenberg was preeminent in assessing health-care quality and patient safety. His efforts in response to the national Institute of Medicine (IOM) report *To Err Is Human* resulted in AHRQ's becoming the world's leading supporter of research to ensure that healthcare is reliably and predictably safe.

Eisenberg often said that he took the greatest pride in the many individuals he had trained—from

medical students to business students to residents, fellows and junior faculty members. The impact of his numerous contributions and his legacy is still unfolding.

Carolyn M. Clancy

See also Agency for Healthcare Research and Quality (AHRQ); Health Economics; Institute of Medicine (IOM); Medical Errors; Patient Safety; Quality of Healthcare; Robert Wood Johnson Foundation (RWJF)

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<http://www.iom.edu>
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<http://www.rwjf.org>
- U.S. National Library of Medicine (NLM), John M. Eisenberg Papers: <http://www.nlm.nih.gov>

industry. Among the terms used are *computerized patient record* (CPR), which pertained to hospitals patient records, and was used prominently from the 1960s through the 1980s; *electronic medical record* (EMR), which pertained to ambulatory care patient records and was used in the 1980s and 1990s; and *electronic health record* (EHR), the current designation that includes patient records from a variety of healthcare entities both within and outside a single healthcare system. These terms, however, are still often used interchangeably.

Function

Today's healthcare industry professionals expect electronic clinical records to provide the following: patient information such as demographic and insurance data; patient health data such as allergies, problem lists, history and physical data, advance directives, operative and other procedural summaries; access and management of test results, including laboratory, microbiology, pathology, and other examinations; patient orders; patient notes and clinician summaries; clinical decision support specific to patient parameters; medication lists; radiology and other imaged studies; diagnoses; consult summaries; patient-specific scanned documents, pictures, and sounds; chronic disease management and pathways/reminders; and access to knowledge sources.

History

While a few large hospitals first began using computers in the 1950s to support financial, billing, and administrative functions, it was not until the 1960s that EMRs were viewed as a possibility. The idea of using computers to record patient treatments was part of President Kennedy's vision for the future of the nation. Early in his term of office, President Kennedy proclaimed that the United States would land a man on the moon by the end of the decade of the 1960s. This ultimately led to increased federal funding of NASA and the development of the nation's space program.

The Lockheed Corporation, one of the major beneficiaries of government funding for space research and exploration, decided that it was in the public's interest to use the recently developed space program technology for the benefit of all citizens of

ELECTRONIC CLINICAL RECORDS

The term *electronic clinical records* encompasses a number of individual designations that have been used by the healthcare information technology

the nation. Lockheed decided to develop a computer application that would manage the patient care delivery and clinical documentation processes in hospitals. In the late 1960s, Lockheed began the project at El Camino Hospital, a community hospital in Mountain View, California. By 1973, the first patient care unit was “live” on a computer system, and the majority of the unit’s clinical processes, nursing observations and interventions, patient orders, and test results were documented and automated in the first electronic clinical record system. This live unit was tweaked and debugged during the next year, before the system was expanded to other patient care units in the hospital. By 1976, the majority of El Camino Hospital was live on the first patient care system, using a large IBM mainframe as its host computer.

By the mid-1970s, as word of the El Camino project spread, other development efforts began to take shape. These efforts were led by a number of companies, such as HBO (now part of McKesson Corporation), McDonnell-Douglas (the aircraft manufacturer whose healthcare information technology business is also now part of McKesson), ISM (product name of PCS/ADS), and SMS (now part of Siemens), among several others. However, the majority of these developments resulted in a number of limited clinical systems that only communicated orders from patient care units to other ancillary departments such as laboratory or radiology. These systems were sold, but in many cases, they were not expanded into functional CPR systems.

In the early 1980s, other companies decided to develop CPR systems. Companies such as Medicus (bought by HBO and now part of McKesson), Meditech, PHAMIS (bought by IDX and now part of General Electric), SMS, Dynamic Control (bought by Baxter, which joint ventured with IBM, then sold to HBOC, which is now also part of McKesson), and Burroughs, among others, all made large investments to develop CPR systems. A number of hospitals invested heavily and spent much time and resources to assist and serve as development sites, but in the end there was not much success. And the majority of these companies went out of this business segment, or larger companies purchased them.

In the mid-1980s, the clinical application segment of the information technology industry

began to stratify because developers and their client hospitals recognized the enormous computer-processing requirement of clinical patient record systems. These systems operating on large computer mainframes became more functional, but they still were less developed than the system developed earlier by Lockheed.

During the 1990s, computer technology advanced, and the industry began to focus on the use of large-scale communication networks and distributed computing through the use of servers and more powerful personal computers. As the cost of computing decreased, healthcare information technology companies began emphasizing client server technology using large servers and extensive communications networks. However, despite these advances, only a minority of the nation’s hospitals have a fully installed and fully used electronic clinical record system.

There has been more success in the use of EMR systems in ambulatory care. Many physician practices and outpatient clinics have been successfully implementing these systems since the early 1990s. Because patient records in these settings are less complex, computerization is more straightforward and more easily adaptable to available technology. Today, a patient is more likely to have an EMR in a physician’s office or clinic than in a large acute-care hospital.

Future Implications

In 2004, President George W. Bush issued an executive order establishing the Office of the National Coordinator for Health Information Technology (ONCHIT). Its mission is to implement EHRs nationwide within 10 years. However, many barriers exist in achieving this goal, including the cost of these systems and concerns over privacy issues. At this point, it seems unlikely that the nation’s healthcare system will become totally paperless in the foreseeable future.

Lawrence M. Pawola

See also Agency for Healthcare Research and Quality (AHRQ); Ambulatory Care; Clinical Decision Support; Clinical Practice Guidelines; Health Informatics; Health Insurance Portability and Accountability Act of 1996 (HIPAA); Hospitals; Patient Safety

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- Healthcare Information and Management Systems Society (HIMSS): <http://www.himss.org>
- Health Information Technology (Health IT): <http://www.hhs.gov/healthit>

ELLWOOD, PAUL M.

Paul M. Ellwood is an innovative figure in health-care. He coined the term *health maintenance organization* (HMO), and he introduced the concept to the Nixon administration as an entity that would compete on the bases of price and quality by combining insurance and health care within a single organization. In 1972, Ellwood tested the HMO concept as a pilot program with 5,000 patients at the Park Nicollet Clinic in Minneapolis, employees from General Mills and other local corporations who were enrolled in this employer-sponsored prepaid health plan. He advised the Nixon White House on the Health Maintenance Act of 1973, which was passed into law. The HMO Act requires that all companies in the nation with 25 or more employees must offer a federally qualified HMO option along with traditional indemnity insurance. The act played a significant role in shifting the direction of the nation's health care system toward managed care.

Ellwood, along with Alain C. Enthoven and the Jackson Hole Group, later went on to propose the idea of managed competition, which is a purchasing strategy for consumers and employers.

The latest idea that Ellwood has initiated is the Pathways to Healthy Outcomes (PATHOS), which calls for increased participation from the federal government in setting standards. The goal of PATHOS is to overhaul the health care system, enhance the power of patients, redefine the role of government as an agent of change and regulator, and ensure health insurance for everyone. PATHOS would accomplish these objectives through the use of the Internet to connect patients and physicians, rely on evidence-based guidelines for prevention and treatment, adopt the use of EMRs, and provide patients with better information on medical treatments and comparative information on physician performance.

Ellwood received his bachelor's degree and a medical degree from Stanford University. He then went on to complete his medical training in pediatrics and neurology at the University of Minnesota and physical medicine and rehabilitation training at the University of Washington. He worked as a consultant at the Brookings Institution for 4 years. Following this, he held various positions at Harvard University, the University of Paris, Stanford University, and the University of Rennes in France. Later, Ellwood served as the executive director of the American Rehabilitation Foundation and the Sister Kenny Institute of Minneapolis. He founded and was the chief executive officer of InterStudy, a Minnesota-based organization dedicated to introducing market forces in health care. He also founded the Jackson Hole Group in Teton Village, Wyoming, a health care reform policy think tank composed of medical, public policy, and business leaders committed to improving the nation's health care system.

Ellwood has received numerous awards and honors. The Foundation for Accountability (FACCT) established an annual award in his honor. Ellwood has also served on many local and national boards, including the national Institute of Medicine (IOM), the American Association of Rhodes Scholars, and the RAND Corporation.

Jared Lane K. Maeda

See also Employee Health Benefits; Enthoven, Alain C.; Health Maintenance Organizations (HMO); Managed Care; Outcomes Movement; Public Policy; Quality of Healthcare

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EMERGENCY AND DISASTER PREPAREDNESS

Emergency and disaster preparedness is taking the necessary precautions and preparations in the event of an emergency or disaster. Medical emergencies, natural disasters (earthquakes, hurricanes, flooding), technological disasters (hazardous material incidents, nuclear power plant failures), and terrorism pose an ever-present risk to life and property. Emergencies and disasters can cause disruptions to the lives of many and can have serious and lasting effects. Being adequately prepared for emergencies and natural disasters can help minimize the confusion and impact of the aftermath. If proper precautions are taken, disastrous situations may be potentially avoided or their effects reduced. Hospitals and other healthcare providers play a critical role in emergency and disaster preparedness since they are on the front lines of responding to and caring for the ill and the injured in the event of such an occurrence.

Overview

Recent studies and government reports continue to express concerns that hospitals are not adequately

integrated into community planning. Moreover, many hospitals remain unprepared in terms of comprehensive response plans, adequate participation in drills, and resources and training. Many hospitals are also not collaborating with other agencies. Surveys of hospital emergency departments have found deficiencies in the knowledge, plans, and resources for responding to hazardous materials (HAZMAT) or radiation incidents. Recent events that were small in scale by comparison with the potential for damage have overwhelmed healthcare facilities; lack of appropriate preparedness plans or familiarity with them as well as the delayed use of personal protection equipment (PPE) have resulted in healthcare staff becoming unnecessarily exposed to toxic agents and subsequently becoming ill. Such was the case in Tokyo during the 1995 subway attacks with sarin nerve gas. Yet during the initial 2 to 3 days of a disaster, local agencies, including hospitals, are the initial responders. Therefore, hospital personnel must be able to meet the challenges of organizing and implementing a mass medical response that may require unfamiliar activities such as decontamination, which is not a part of daily routine practices.

Clearly, community emergency and disaster preparedness is a complex undertaking given the number of stakeholders and responder agencies, local vulnerabilities, disparate resources, and potential hazards. As such, it is imperative that all healthcare facilities have preparedness plans in place, practice these plans on a regular basis, and ensure that these activities are integrated with multiple agencies that are responsible for a mass casualty event.

Components of Disaster Planning

Preparing for mass casualties from natural disasters, technologic disasters, and terrorism requires a multisystem approach that involves local and federal public health agencies along with other emergency networks and healthcare facilities. The basic components of such a plan include the following: hospital incident command system (HICS), hospital personnel, network of communication, first responders, PPE, cancellation of nonessential services and procedures, obtaining necessary supplies and medications, triaging both patients and vital resources, medical surge capacity, security

issues, National Incident Management System (NIMS) compliance, and critical analysis. Each of these components is discussed further below.

Hospital Incident Command System

The HICS is a core component of the NIMS and is mandated by the Joint Commission. HICS is a standardized incident management tool that enables healthcare facilities to organize resources and staff in order to remain operational during any emergency while promoting the restoration of routine, daily functions. HICS is based on a command-and-control system. In this system, the designated incident commander oversees the operational planning, logistics, and financial aspects of the event, with the ultimate goal of minimizing chaos. The responsibilities of the incident commander include monitoring the cost of the incident, maximizing safety, using personnel efficiently, and resuming normal operations as soon as possible. The key personnel involved include the incident commander, public information officer, safety officer, liaison officer, medical specialists, operations section chief, finance/administration section chief, environmental services, and planning or logistics section chief.

Hospital Personnel

The hospital emergency department is typically the “first receiver” of an emergency or disastrous situation. Therefore, the mobilization of clinical staff is an integral aspect of an emergency response. A central labor pool may be needed to establish order for the command center and coordinate staffing requirements. Prior staff training to deal with an increase in medical surge is paramount in preparing for disasters.

Network of Communication

Communication is key to coordinate internal responses, interact effectively with multiple agencies, and deliver important information in the form of risk communications to the public and media in a timely manner.

Hospitals must work to make sure that they have a communication network setup within a regional county in the event that they run low on medical supplies or have an overflow of patients during a disaster. Hospitals must also keep active

communication with their departments so that they know how many patients can be received and also can monitor the level of essential medical supplies.

As part of the overall communication strategy, it is important to have communication plans established that include the fire department, police department, ambulance services, emergency operations, and all hospitals within a reasonable distance. A common radio frequency and interoperability of equipment should be in place. Additionally, planning for disruptions and backup strategies are necessary to keep communication channels open.

First Responders

First responders may be called on in the event of a HAZMAT, radiological, or explosive event. Therefore, the training of first responders to coordinate with healthcare facilities is essential. First responders will be transporting many patients to healthcare facilities in the event of a major emergency or disaster. As a result, healthcare facilities should be prepared to identify, triage, track, and manage the large surge of incoming patients.

Personal Protection Equipment

PPE is necessary to protect responders from becoming contaminated. PPE is designed to protect the rescuer in a disaster management scenario from becoming a victim and to prevent the delay of rescue operations. There are four levels of protective equipment. Level A provides the most protection against vapors and liquids and includes a self-contained breathing apparatus (SCBA) and an airtight suit. Level B is used when there is no danger against vapors and only a danger involving chemicals. This level of equipment includes a chemical-resistant suit and an SCBA. Level C includes a full-faced air-purifying mask respirator and a splash suit that is chemical resistant to be used by individuals who work in a triage area. Level D is used when there is no skin or respiratory hazard, and it includes work clothes that cover an individual’s regular clothing.

Cancellation of Nonessential Services and Procedures

The cancellation of nonessential services and procedures is pivotal if a healthcare facility knows

ahead of time that it will be receiving an influx of patients from a disaster. Strategies to expedite discharge of patients and cancel all elective surgeries should be considered to accommodate a surge in patients.

Obtaining Necessary Supplies and Medications

The pharmacy plays a central role during a mass casualty incident. Pharmacies should be stockpiled to treat enough patients for 48 to 72 hours or until resources can be replenished from a nearby facility. Pharmacies should also be in contact with these facilities to obtain needed supplies.

The National Pharmaceutical Stockpile (NPSP) can help ensure the rapid deployment of pharmaceuticals, antidotes, medical supplies, and equipment. It also maintains vaccines that can be made readily available in the event of a biological attack or pandemic.

Triaging Patients and Resources

In the event of mass casualties, patients may not arrive with first responders, but they may arrive on their own at hospital emergency departments after evacuating the scene of the incident. Because of this, hospitals should be prepared to expect a large number of patients and anticipate more than what is reported by responders on the scene.

Triaging patients during an overflow period should only take 30 seconds per patient, and patients should be color-coded. Red indicates that a patient is in need of immediate care. Yellow signifies that a patient is in stable condition but needs care soon. Green indicates that a patient has minor injuries and can wait a little while for treatment. Finally, black means that a patient will not survive. The goal of triage during a mass casualty event is to help the patients who will most likely survive and to treat patients with reversible pathological processes by using as few resources as possible.

Medical Surge Capacity

Medical surge capacity refers to the number of potential patient bed spaces that can be made available to triage, manage, vaccinate, decontaminate,

or accommodate patients. The surge capacity also involves the ability of a healthcare facility to manage patients who may require specialized evaluations, intervention, and treatment. The surge capacity can be accomplished by transforming certain nonclinical areas of a healthcare facility, such as a lounge, waiting area, or auditorium, to hold patients by adding gurneys or cots.

A concern regarding surge capacity is that many hospitals and healthcare facilities lack this availability as they are already overburdened with patients on a daily basis. A significant challenge to meeting the surge capacity is to determine the number of patients a healthcare facility should actually prepare for since estimation of the potential demand varies by a given scenario. A common estimation that is used for surge capacity is to prepare for 500 victims per 1 million residents above the daily capacity of the facility. This generally results in a 20% increase in capacity.

Security

Security at both the site of the disaster and the healthcare facility is essential to emergency preparedness. Crowd control is needed to prevent anarchy and the disruption of healthcare providers from carrying out their duties. Steps should be taken to contain traffic, especially at the triage area, and a lockdown of the hospital emergency department should also be planned for. Coordination and communication with local law enforcement may be needed to ensure smooth operations during a disaster.

National Incident Management System Compliance

In 2003, President George W. Bush issued the Homeland Security Presidential Directive-5 (HSPD-5), which mandates state and local adoption of the NIMS as a requirement for receipt of federal funding. The NIMS Integration Center (NIC) has been designated as the lead federal agency to coordinate NIMS compliance. The National Incident Management Capability Assessment Support Test (NIMS CAST) is a self-assessment program for organizations to assess their ability to effectively prepare for, prevent, respond to, and recover from domestic incidents.

Critical Analysis

The debriefing and critical analysis of staff performance following a major traumatic event is an essential component of any emergency preparedness plan. This process should occur once the disastrous event has passed but prior to the resumption of usual routine activities.

Implications for Healthcare Facilities

Healthcare facilities play a central role during an emergency or disaster. Without the proper plan in place and the right networks set up, healthcare facilities will be in chaos during an emergency or disaster. During and after such an event, the facilities will need to treat many more patients than they can normally accommodate. This can only be accomplished through appropriate planning, organization, and preparation. Preparedness is the key factor in being able to effectively and efficiently deal with an emergency or disaster.

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See also Access to Healthcare; Bioterrorism; Emergency Medical Services (EMS); Hospital Emergency Departments; Hospitals; Joint Commission; Public Health; Vulnerable Populations

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- Centers for Disease Control and Prevention (CDC): <http://www.bt.cdc.gov>
- Federal Emergency Management Agency (FEMA): <http://www.fema.gov>
- Joint Commission: <http://www.jointcommission.org>

EMERGENCY MEDICAL SERVICES (EMS)

The purpose of emergency medical services (EMS) is to provide the highest level of prehospital care by a trained professional until the patient is under the care of a physician or other appropriate healthcare professional. The person who provides such care is called an emergency medical technician (EMT). A paramedic is the highest level of EMT and provides the most extensive prehospital care. The primary goal of an EMT is to provide medical care out of the hospital environment or in a trauma situation, with the objective of transporting the patient in a stable medical condition to the hospital, whereupon emergency physicians will then take over. An EMT also may have to deal with environments that might not be completely safe. According to the National Association of Emergency Medical Technicians (NAEMT), EMTs transport more than 16 million patients in the United States annually.

History

The concept of out-of-hospital care can be credited to Dominique Jean Larrey (1766–1842), who was Napoleon's chief army surgeon. Larrey recognized that it was imperative to treat wounded soldiers as

quickly as possible. To accomplish this, he created the *ambulance volante* or “flying ambulance service” to rapidly transport the wounded. The concept behind the idea was to perform medical procedures as close to the battlefield and as quickly as possible. He believed that the quicker a procedure was done, the better are the chances the patient would survive. Larrey increased the mobility and improved the organization of field hospitals, establishing the first Mobile Army Surgical Hospital or MASH units. Larrey also created the concept of “triage,” which in French means “to sort.” He established rules for the triage of the wounded; treating them according to the seriousness of their injuries and the urgency of their need for medical care.

In 1865, during the American Civil War, the first civilian ambulance service was created. Four years later in New York City, ambulances were created that consisted of horse-drawn carriages staffed by physician interns to assist at the scene of the trauma and treat the patient as quickly as possible. However, it was not until the 20th century that ambulance services began to be used widely.

During World War I, the average evacuation time for combat personnel was 18 hours, resulting in a high mortality rate. Because of this, during World War II, focus was placed on the expeditious transportation of injured personnel from the frontlines to areas where physicians were available. Although many medical advancements were made during World War I and II, advancements in training EMTs and prehospital care did not occur at home in America.

It was not until the mid-1960s that prehospital care received the attention of government and the public. Many people before this time thought that all care for the sick and injured occurred in the hospital and therefore saw no reason for paramedics to be well versed in life-saving techniques, believing that hospital physicians would be able to save the patients. In addition, most EMTs were poorly trained and did not have adequate equipment. However, in 1966, all this changed with the publication of *Accidental Death and Disability: The Neglected Disease of Modern Society*, which was written by the National Academy of Sciences, National Research Council. This report was extremely influential and represented a turning point in EMTs’ responsibilities.

The report identified that there were 52 million accidental injuries in the nation, accounting for a total of \$18 billion in 1965. The report provided a number of recommendations for the development of EMS systems. It recommended greater training of EMTs to deal with various trauma situations. The report proved to be highly influential, and many initiatives were undertaken by both private and government organizations.

One of the most important results of the report was the passage of the federal National Highway Safety Act of 1966, which helped create the U.S. Department of Transportation (DOT). From 1968 to 1979, the DOT allocated more than \$142 million to help train EMTs. In 1973, the U.S. Congress passed the Emergency Medical Services Systems Act, which provided funding to help support the training of EMT facilities. In addition, the National Highway Traffic Safety Administration (NHTSA) established state-wide EMS technical assessment programs that defined the basic components of an EMS system. The components consist of the following: regulation and policy, resource management, human resources and training, transportation, facilities, communications, trauma systems, public information and education, medical direction, and evaluation.

Certification and Learning

A high school diploma is required to begin formal EMT training. There are essentially three levels of EMT training. EMT-Basic level involves training in basic stabilization and emergency skills that do not involve medications. EMT-Intermediate level may require up to 350 hours in training of advanced airway skills and limited medication use along with intravenous fluid administration. EMT-Paramedic is the most advanced level and may take up to 2 years to complete. Course work in this area involves extensive study in anatomy, physiology, and pharmacology as well as advanced resuscitative skills.

To be certified as an EMT, an individual must successfully complete a course that is in accordance with the EMT-Basic, Intermediate, or Paramedic National Standard Curriculum, which is published by the DOT. Licensure is required in all 50 states for all three levels. Generally, recertification must be accomplished every 2 years with Continuing Medical Education requirements.

Hazardous Material Teams

Today, EMTs must be ready to respond to many types of HAZMAT incidents, including terrorist attacks. EMTs may come into contact with various HAZMATs such as biological, chemical, or radiological agents. Chemical and other types of spills are foreseeable with 4 billion tons of HAZMATs being transported across the country each year. The most common route of exposure in HAZMAT incidents is via inhalation. The federal agencies that are responsible for regulating the transportation of HAZMATs are the Occupational Safety and Health Administration (OSHA) and the Environmental Protection Agency (EPA). Furthermore, the National Fire Protection Association (NFPA) has developed a set of standards for responding to HAZMAT. NFPA Standard 471 establishes guidelines and tactical objectives for HAZMAT management while NFPA Standards 472 and 473 establish responder competency for HAZMAT incidents.

A contaminated site is often classified into zones. The hot zone or red zone is where the actual spill or contamination occurred, and only professionals who have the correct protective gear should enter this area. The warm zone or yellow zone is next to the hot zone, and it is where the decontamination occurs. The cold or green zone is where no contamination occurred, and it is where the command post is located. The green zone is the safest zone, and no one should be allowed in this area unless they have been cleansed of all contaminants that they have come into contact with in the hot zone. EMT/HAZMAT personnel should approach the contaminated site upwind or uphill if at all possible. EMTs have certain responsibilities in dealing with HAZMAT incidents. These responsibilities are based on their level of training. A Level 1 responder is a first responder who can provide care in the zone outside the contamination area (cold zone) and who does not pose a risk of secondary contamination. A Level 2 responder can treat patients in the contamination zone (warm zone) and can coordinate EMS activities.

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See also Access to Healthcare; Bioterrorism; Emergency and Disaster Preparedness; Geographic Barriers to Healthcare; Hospital Emergency Departments; Intensive-Care Units; Physicians; Rural Health

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- National Association of Emergency Medical Technicians (NAEMT): <http://www.naemt.org>
- National Fire Protection Association (NFPA):
<http://www.nfpa.org>

EMERGENCY MEDICAL TREATMENT AND ACTIVE LABOR ACT (EMTALA)

The federal EMTALA, also known as the Anti-Dumping Law, was passed in 1986 as part of

the Consolidated Omnibus Reconciliation Act. EMTALA requires all hospitals receiving certain federal funds to provide medical screening examinations to all persons who arrive at their emergency departments, whether they have health insurance or not.

The intent of EMTALA is to ensure patient access to emergency medical care and to prevent the practice of patient dumping. Patient dumping occurs when patients in need of emergency care are transferred to another hospital before they are medically stable. The practice was especially prevalent when hospitals thought that the patients were unable to pay for their care. Patient dumping of uninsured patients from private hospitals to public hospitals grew rapidly in the 1980s as insurance companies promoted managed-care plans, reimbursement patterns changed, and hospitals were unable to shift the costs of bad debt, charity care, and uncompensated care to privately insured patients.

EMTALA imposes duties on all the nation's hospitals receiving Medicare reimbursement. Generally, hospitals must offer an appropriate medical screening examination to any patient seeking emergency services to determine whether or not an emergency medical condition exists. If a life-threatening condition is found, the hospital must provide the patient with stabilizing treatment within the capabilities of the facility and its staff, or if the patient cannot be stabilized, the hospital must arrange for an appropriate transfer of the patient after considering the patient's condition and the risks and benefits of the transfer.

EMTALA was not intended to create a private cause of action against the hospital and physician, but it can result in fines of up to \$50,000 per violation to both the hospital and the physician and the loss of Medicare reimbursement.

Background

Prior to the passage of EMTALA, there were several laws, rules, and guidelines in place designed to protect patients against patient dumping. Passed by the U.S. Congress in 1946, the Hospital Survey and Construction Act, more commonly referred to as the Hill-Burton Act, required hospitals to treat and stabilize all emergency patients prior to discharge as a condition for receiving federal funds for construction and modernization. However, the

federal government failed to define *emergency* in the regulation; there were no punitive remedies for violations; and despite the private right of action under Hill-Burton, most patients remained unaware of their rights and remedies under the statute.

The Joint Commission has hospital guidelines that state that individuals shall be accorded impartial access to treatment or accommodations that are available or medically indicated, regardless of race, creed, sex, nationality, or source of payment for care. The American College of Emergency Physicians (ACEP) also has issued guidelines against patient dumping. However, neither of these organizations has the power to impose penalties for a hospital's failure to comply with these guidelines.

Starting in the early 1980s, a number of articles were published in medical and public health journals as well as in the popular press addressing the issue of patient dumping. Several of the articles were written by physicians from Cook County Hospital (now John H. Stroger Hospital), the large inner-city public hospital in Chicago that primarily serves the poor, detailing the large extent of patient dumping at that facility. The authors found that the majority of the transfers were patients who were unemployed or minorities, with 95% of those patients having no health insurance. The reason stated most often for the transfers was lack of insurance in 87% of the cases. And nearly 25% of the patients were found to be medically unstable at the time of the transfer.

The practice of patient dumping was not limited to Chicago. Most large cities with public hospitals were also burdened by the practice. In 1986, it was estimated that nationally about 250,000 inappropriate transfers of medically unstable patients occurred, which was thought to greatly increase the patients' morbidity and mortality.

These articles, reports by the press, and news programs profiling transfer patients contributed to the enactment of EMTALA. According to one Senator, the law was passed to send a clear signal to the nation's hospitals, public and private alike, that all Americans, regardless of wealth or status, should know that a hospital will provide whatever services it can when they are truly in physical distress.

The Statute

EMTALA imposes a number of requirements on hospitals with emergency departments that have

Medicare provider agreements. (Because Veterans Health Affairs [VA] hospitals and other military hospitals do not participate in the Medicare program, they are exempt from EMTALA.) The act imposes several duties on hospitals, which were often unclear to healthcare professionals charged with complying with these rules.

There are essentially nine legal duties imposed on hospitals by EMTALA: (1) a medical screening examination must be performed for all patients who come to the emergency room; (2) the screening must not be delayed to determine the patient's ability to pay; (3) the medical screening examination must be performed in a nondiscriminatory manner for all patients; (4) the hospital must use all available resources to stabilize the patient for transfer; (5) the referring hospital must transfer the patient in an appropriate manner; (6) the receiving hospital must accept the patient if the transfer is appropriate; (7) the patient has the right to refuse treatment and the transfer; (8) the hospital must log and document the emergency evaluation and treatment of every patient; and (9) if a receiving hospital suspects an EMTALA violation, it must be reported within 72 hours, and in return, the government provides whistle-blower protection to the reporting entities.

In 2003, the Centers for Medicare and Medicaid Services (CMS) issued the Final Rule and added some new requirement to EMTALA. The additional requirements of the Final Rule specify that hospitals providing EMS must post signs identifying the rights of individuals under EMTALA with respect to examination and treatment for emergency medical conditions and the rights of women in labor. Hospitals also are required to maintain the records related to patients transferred to or from the hospital for a 5-year period. A list of physicians who are on call for duty must also be maintained. Finally, the hospital must maintain a log of individuals who sought treatment at the emergency department and whether the patients were treated, stabilized, or discharged.

Enforcement

The Office of the Inspector General (OIG) of the U.S. Department of Health and Human Services (HHS) and the CMS jointly enforce the EMTALA regulations.

The CMS receives EMTALA complaints at its 10 regional offices. If one of the CMS offices finds an EMTALA violation, it notifies the hospital that it may be terminated from participation in Medicare unless it takes appropriate remedial action. The CMS office provides the hospital with a statement of deficiencies and a notice of termination. If a violation involves a medical issue, a quality improvement organization (QIO) reviews the medical issue from a physician's perspective.

Subsequently, the regional CMS office notifies the OIG so that it can determine whether to levy fines against the hospital. Under EMTALA, the OIG can impose a civil monetary fine of up to \$50,000 per violation or a fine of \$25,000 for small-size hospitals. In addition, physicians may be fined up to \$50,000 if they have been found to have negligently violated their duty to examine, treat, or transfer an individual to a participating hospital.

The OIG is not required to impose penalties on hospitals found to be in violation of EMTALA. However, if monetary penalties are imposed, they are subject to administrative and judicial review.

Benefits and Limitations

The most important benefit of EMTALA is that it is designed to ensure that everyone who needs emergency medical care receives it. Patients can have some peace of mind knowing that if they need emergency care, they will usually receive it. Improper and inappropriate transfers are significantly lower now than before EMTALA was enacted.

Another benefit of EMTALA is that the potential negative publicity from a violation of the legislation may be a deterrent against hospitals and physicians failing to fulfill the duties the act imposes on them.

However, the specific language of EMTALA is vague. The vague language serves to eliminate loopholes that providers may conjure up to deny necessary emergency treatment based on the patient's ability to pay, and it creates an impetus for responsible healthcare professionals to interpret the regulations broadly in their effort to satisfy all stated and implied requirements of the law. Unfortunately, the vague language also creates significant room for misinterpretations of the requirements.

A major limitation of EMTALA is that managed-care organizations (MCOs) can potentially

use the law to avoid payments for emergency medical care. Many of these organizations require pre-authorization before they agree to pay for treatment that their clients will receive. This leaves hospitals at risk of not being reimbursed for providing services for patients who actually have health insurance coverage, in addition to those patients who are uninsured, for whom hospitals are also unlikely to be reimbursed.

Another limitation of EMTALA is that it is an unfunded mandated program for hospitals. EMTALA does not provide any payments for uninsured patients who hospitals are required to treat. This is especially troublesome for inner-city, not-for-profit hospitals, which already bear a disproportionate share of uninsured patients and Medicaid recipients.

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See also Access to Healthcare; Hospital Emergency Departments; Hospitals; Medicare; Patient Dumping; Public Policy; Regulation; Uninsured Individuals

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- U.S. Department of Health and Human Services, Office of Inspector General (OIG): <http://oig.hhs.gov>

EMERGING DISEASES

Emerging diseases may be defined as any infectious or pathogenic agent that is capable of causing disease and/or has newly appeared in a population. The infectious agent may have not been previously discovered, or it may be a new variant of an existing disease. Additionally, an emerging disease may be one that has previously existed in a population but is rapidly increasing in incidence or in geographic range. An increased incidence, or the number of new cases of a disease, over the course of a 20-year period is considered to be an emerging disease by epidemiological standards.

The source of emerging diseases may vary considerably and can result from pathogenic infectious diseases caused by bacteria or viruses. Inorganic materials and carcinogens, such as asbestos and dioxins, may also be responsible for an increased incidence of autoimmune and genetic diseases, such as cancer and birth defects. Also, a preexisting disease may reemerge in a population because of developing drug resistance or a breakdown in the public health system. Although the number of deaths due to emerging diseases has been decreasing in recent years, globally about 15 million deaths each year are attributed to infectious diseases. In the United States alone, the direct cost of infectious disease totals approximately \$30 billion a year and is the third leading cause of death. Furthermore, infectious diseases are responsible for approximately 30% of all disability-adjusted life years (DALYs) worldwide, and they are a major cause of disability and poor health.

Overview

Emerging diseases have been in existence ever since historical times, and they are responsible for many deaths worldwide each year. For many centuries, however, humans remained helpless against these diseases as their causes were relatively unknown. The establishment of the germ theory eventually led to tremendous progress in the understanding of emerging diseases and of how to prevent and treat these occurrences. The discovery of penicillin, vaccines, and treatment for infectious diseases in the 1900s caused the U.S. Surgeon

General in 1967 to prematurely claim a victory in the battle against this enemy.

The battle against emerging diseases, however, is far from over as it continues to take a significant toll on human life. Acquired immune deficiency syndrome (AIDS) is likely to surpass the Black Death and the 1918 influenza pandemic as one of the world's worst killers. Other recent emerging diseases include severe acute respiratory syndrome and monkeypox. Some newly emerging infectious diseases result in chronic diseases that are caused by infectious agents. Examples of this include certain variants of the human papillomavirus that cause cervical cancer and the herpesvirus, which causes Kaposi sarcoma.

Emerging diseases have inflicted tremendous suffering, particularly among people in resource-poor areas and developing countries. In developing nations, the burden of infectious diseases predominantly affects infants and children, while in developed nations the poor and minority groups are disproportionately affected. Although there has been tremendous progress made to prevent and treat many of these pathogens, emerging diseases continue to exist throughout the world and remain a constant threat.

The majority of cases of emerging diseases can be directly linked to infectious agents and their variants. There are six major classes of agents that are commonly responsible for the emergence of infectious diseases. These classes include bacteria; viruses; fungi; protozoa; helminthes; and a newly recognized agent, prions. These six classes of infectious agents represent the majority of newly classified emerging infectious diseases, with bacteria and viruses being the most prevalent.

Emerging infectious diseases may spread through microbial traffic. Microbial traffic is the introduction of an infectious agent that already exists in a population (human or otherwise) from other species. This includes the spread of infectious agents from smaller to larger populations and/or new geographic areas, such as the avian flu and West Nile viruses. Other factors that contribute to the propagation of infectious disease are human demographics, human behavior, technology, economic development, natural disasters, commerce and trade practices, as well as the breakdown of basic public health measures, as is the case with tuberculosis in the developing countries.

One of the most common ways in which emerging infectious diseases are spread is through zoonoses or transmission from animals to humans. The mechanism of transmission for the bubonic plague was by way of an animal reservoir (rats) and a vector (fleas). In this case, fleas that live on and bite rats were infected with the bacteria and were able to transmit the bacteria to humans through the same mechanism.

During the plague epidemic, overcrowded cities, open sewers, human waste, and garbage in abundance provided an ideal breeding ground for both rats and fleas. Both the reservoir and the vector living in very close proximity to the human population allowed the widespread infection and progression from one geographic area to another.

The cause of the emergence and the reemergence of agents that may result in disease are complex, but they typically can be traced to the ability of most microbes to evolutionary adapt genetically. Natural genetic variations, recombination, and adaptations allow new strains of pathogens to appear to which the human immune system has not been previously exposed and is therefore not primed to recognize. Furthermore, human behavior plays an important role in the reemergence of diseases. The increased and sometimes imprudent use of antimicrobial drugs, including antibiotics, has led to the development of resistant pathogens, allowing many diseases that were once treatable with pharmaceuticals to reemerge with increased virulence, which allows the pathogen to reinfect exposed individuals as well as infect previously nonexposed humans. Additional behavioral issues arise when an individual is prescribed an antibiotic for an infection and fails to complete the entire regimen of the drug. This situation tends to specifically select for and propagate the hardest of bacteria.

Another contributing factor to the spread of emerging diseases is that of demographics and geography. This is due to the fact that the sustainability of an epidemic depends on a population exceeding a certain threshold density of susceptible individuals. Over the course of the past 5 years, approximately 20 million refugees and 30 million displaced peoples have been on the move worldwide, crossing borders and relocating for a multitude of reasons. This combined with modern modes of travel and decreased travel time, which

allows an individual to move between continents within the time span of a day, create unique demographic opportunities and pressures as well as increasing the amount of microbial traffic. With worldwide travel occurring in the time period of a day and becoming more frequent, the possibility for a pathogenic variant being transmitted to a completely immunologically naive population is not only possible but under certain circumstances quite probable.

HIV/AIDS

Human immunodeficiency virus (HIV) has infected more than 60 million people worldwide, and it is the leading cause of death for those aged from 15 to 59 years. This disease possibly emerged from the consumption of nonhuman primates in sub-Saharan Africa between 60 and 100 years ago. The spread of HIV likely emerged because of the vast movement of human populations from rural to impoverished urban areas combined with sexual promiscuity. The complex interactions between agent, host, and environment demonstrate how changes and movements in the population led to this pandemic.

Although many individuals in the developed nations have benefited from highly active antiretroviral therapy (HAART) to treat this condition, few people in the developing nations have been able to receive appropriate treatment. Developing a vaccine to prevent the transmission of HIV has proved to be a very difficult challenge.

Tuberculosis

Tuberculosis (TB), caused by *Mycobacterium tuberculosis*, was once a controlled disease after the discovery of isoniazid and other drugs. However, in recent years, TB has reemerged as one of the world's most lethal diseases, killing more than 2 million people each year. The reemergence of TB was propelled by the large number of immunologically suppressed individuals infected with HIV/AIDS. The inappropriate use of TB treatments has also resulted in drug-resistant strains and costly treatments, further complicating this problem. With many people in the world continuing to live in poverty, controlling TB remains an enormous challenge.

Malaria

Although once controlled, malaria has reemerged as one of the most important diseases confronting the developing world, and it has disproportionately affected children in sub-Saharan Africa. Malaria causes about 1 million deaths each year, and it has affected more than 300 million individuals in the world. Although for many years, dichlorodiphenyltrichloroethane (DDT) was used in mosquito abatement programs, the insecticide is no longer widely used because of potential health concerns and insect resistance. As a result, malaria has reemerged as a public health problem worldwide.

Influenza

In the United States, influenza causes an estimated 200,000 people to be hospitalized, and about 36,000 individuals die each year from this condition. Globally, each year, about 3 to 5 million people are infected with influenza, and it causes between 250,000 to 500,000 deaths.

Influenza has gained attention in recent years with the outbreak of the avian influenza in Southeast Asia. An estimated 42 individuals died from this highly virulent strain, which killed millions of birds and chickens. Although few cases of human-to-human transmission have been reported, this virus may infect humans from other species. The avian flu is being closely monitored to see if variants of this disease may cause transmission more easily among humans, which could result in a pandemic, such as the 1918 influenza outbreak.

West Nile Virus

West Nile virus is a reemerging disease, commonly found in Africa, West Asia, Europe, and the Middle East, that has recently made its way to the United States. This disease was first reported in New York City in 1999, where there were a total of 62 cases. West Nile virus is known to mostly affect birds; however, humans may be infected through a mosquito vector. This virus generally spreads during the warm, summer months. Currently, there are several therapies being tested to treat the disease.

SARS

Severe acute respiratory syndrome is a respiratory disease caused by the SARS coronavirus, and it results in flulike symptoms. SARS emerged in late 2002 in Asia, and it quickly spread, alerting public health officials. Although it is still considered to be a rare disease, the near pandemic of SARS resulted in 774 deaths. The rapid emergence of SARS highlights the need for public health authorities and researchers to work closely together.

Drug-Resistant Microbes

Drug-resistance viruses and bacteria are quickly reemerging and are the result of mutations and of bacteria acquiring genes through transformation or infection with plasmids. Consequently, antibiotics such as sulpha drugs, penicillin, methicillin, and vancomycin, which were once routinely used to treat bacterial infections, no longer work. *Streptococcus pneumoniae* and *Staphylococcus aureus* have now become resistant to existing lines of treatment and are causing serious concern. Because of these resistant pathogens, continued efforts must be made to find treatments that are effective against these microbes.

Bioterror Agents

Some emerging diseases may be deliberately released, as in the case of microbial warfare and bioterrorism. Deliberate release of diseases may include the use of microbes that have been genetically engineered or produced to cause extreme and severe harm—for instance, the 2001 anthrax attack targeted at U.S. congressional leaders. Because of these growing bioterror threats, the U.S. government has initiated the construction of several regional biocontainment laboratories to detect, prevent, and treat diseases that are the result of these pathogens.

Future Implications

Emerging and reemerging diseases continue to challenge public health officials, and they pose an ever-present threat to the public's health. The effects of emerging and reemerging diseases are

unpredictable, therefore a timely response is needed to detect, diagnose, and contain these threats. Coordination of international and local agencies is needed for surveillance and to adequately respond to these threats. Additionally, continued clinical and translational research into these pathogens is paramount.

Several initiatives have been started by the United States, the United Kingdom, and the World Health Organization (WHO) to increase surveillance and the early detection of emerging infectious diseases in an attempt to curtail widespread transmission and to prevent mass infections of populations at risk. Through cooperative efforts between governments, early-warning communication and countermeasures to the threats of newly emerging infectious diseases can be accomplished. These concerted efforts should provide the best possible chance of avoiding widespread epidemics and pandemics in the future.

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See also Bioterrorism; Centers for Disease Control and Prevention (CDC); Disease; Emergency and Disaster Preparedness; Epidemiology; Infectious Diseases; Public Health; World Health Organization (WHO)

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 World Health Organization (WHO): <http://www.who.int>

EMPLOYEE HEALTH BENEFITS

Employee health benefits are a service that is provided by an employer to employees in addition to wages or a salary. Employer-sponsored health benefits is the most common source of health insurance coverage in the United States, and it is a major source of health insurance for the working-age population and, to a lesser extent, retirees. Most Americans receive health insurance coverage through their job or through a family member's employer. In 2005, nearly 162 million individuals, or more than 93% of all persons with private health insurance, were covered by an employer-sponsored health plan, either as direct plan participants or as the beneficiaries of a participant's plan. Employers generally use health benefits to attract and retain workers; however, the rising costs of healthcare have become an increasing concern in recent years. Many experts believe that employer-sponsored health coverage has reached a tipping point as the number of covered individuals has been declining since 2000. Because the provision of health benefits is a matter of discretion on the part of employers and plan participation is generally voluntary by employees, health insurance coverage follows a distinct pattern linked to family income: The higher the family income, the more likely the presence of benefits.

Similarly, because the U.S. tax code extends favorable economic treatment to health insurance when purchased through an employer-sponsored plan, lower-income persons—the very individuals least likely to have employer-sponsored benefits—also have no tax subsidies available to help offset the cost of securing individual coverage. Furthermore, even when individuals can find affordable plans in the individual marketplace, coverage may

be highly restricted and may contain provisions that exclude any coverage of healthcare needs deemed by the insurer to relate to preexisting conditions. As a result, access to benefits in the workplace is a significant determinative of coverage.

Overview

Employer-sponsored health insurance coverage has been referred to as the accidental system, because its origins can be traced back to a decision to exclude employer contributions to coverage from family income during World War II, when strict wage and price controls were in effect. This decision was formalized as a part of the Internal Revenue Code Amendments of 1952, following which the proportion of persons with employer-sponsored coverage began a dramatic climb, reaching its apex in the mid-1970s. Changes in labor patterns, family composition, and the underlying economy have all contributed to the slow erosion of the system, along with a more precipitous decline in the number of retirees. In the early 1990s, two thirds of all retirees had employer-sponsored coverage; by 2005, this figure had declined to one third.

Employer-sponsored benefits create several distinct advantages for covered persons and are both tangible and intangible. First, because coverage is based on a group, the cost of coverage is significantly lower and coverage is significantly more generous than coverage obtained on an individual basis. Second, under the provisions of the tax code, employer contributions to coverage are excluded when calculating taxable income, thereby greatly reducing the cost of coverage (of course, cash wages may also be lower in recognition of this contribution to income). Third, many employers have adopted tax-advantaged arrangements that permit employees to contribute toward their own premium costs—where applicable—on a pretax basis, further reducing the cost of coverage. Fourth, many employers now offer tax-advantaged savings accounts in conjunction with, or in addition to, health benefit plans, thereby further reducing employee healthcare costs by permitting employees to contribute to these accounts and purchase uncovered healthcare on a pretax basis.

Actual revenue losses to the U.S. Treasury resulting from employer-sponsored health plans are considerable, surpassing \$200 billion in FY2006 alone. Furthermore, since state tax codes generally mirror the U.S. tax code where employer-sponsored income is concerned, revenue losses actually are significantly higher.

Finally, health insurance coverage has an incalculable value to covered individuals because it protects against economic loss from both foreseeable and unforeseeable healthcare expenditures. Whereas traditional notions of insurance would limit coverage to losses related to unanticipated events (such as serious illness or injury), it is in fact customary for employer-sponsored plans to cover at least some level of preventive and primary health benefits, such as well-child care, screening mammography, and immunizations. In essence, therefore, employer-sponsored plans function as a tax-free means of supplementing family income.

In addition to health insurance coverage, employee health benefits may also include dental and vision coverage, sick leave, maternity leave, and family medical leave. Employers have also realized the cost savings potential of health-education-related programs, known commonly as employee assistance programs, that reduce the health risks of employees. As a result, employers have developed worksite health promotion programs to assist employees modify their lifestyle through, for example, cessation of smoking, increase in physical activity and weight loss, and change of diet. Research has shown that a comprehensive worksite health promotion program can have positive benefits for employee health and for the employer through reduced absenteeism and employee turnover.

Employee Retirement Income Security Act

The Employee Retirement Income Security Act (ERISA) has played a central role in protecting and standardizing employee health benefits. ERISA covers most private health plans, and it ensures the rights of employees and beneficiaries by providing protections and ensuring access to information on health plans. Employers who manage their own plans must also make sure that certain standards are met to be in compliance with ERISA.

Trends in Employer-Sponsored Insurance

The patterns of employer-sponsored insurance have generally followed the overall trends of the economy. Although the number of nonelderly with employer-sponsored insurance grew in the early to mid-1990s, the proportion of U.S. residents with employer-sponsored insurance declined from 69.1% to 63.1% between 1994 and 2005. It has been suggested that the decline in employer-sponsored insurance is due to the lack of take-up by employees. Because health plan participation by employees is generally voluntary, not everyone who is offered employer-sponsored insurance takes advantage of this benefit. The affordability of health insurance coverage is an important concern among many low-wage workers. The decision to take up health insurance may be influenced by several factors, including the level of out-of-pocket expenses, the quality of the benefits package, and the availability of insurance through alternative sources.

Regardless of the trends in employer health insurance coverage, studies have shown that sociodemographic characteristics such as race, gender, and position in the labor market are associated with the receipt of health benefits. For instance, younger and lower-income workers are less likely to be covered through employers, and full-time workers are more likely to be covered than part-time workers. Furthermore, workers in occupations that require higher skill levels and have more responsibility, such as managerial and professional services, are more likely to have employer-based health insurance coverage than workers who are in the service industry. In addition, public-sector workers are more likely to have employer-sponsored coverage than private-sector workers. Among private-sector workers, however, employees who work in larger firms are more likely to receive health benefits than those who work in smaller firms.

Health Plan Enrollment and Healthcare Costs

Over the past decade or so, the number of individuals enrolled in traditional fee-for-service plans has declined substantially. The majority of employers generally now offer their employees a managed-care plan with level-dollar contributions,

meaning that if an employee chooses a more expensive plan, he or she will have to pay for the difference in cost. The reason for the growth in managed care is because it slowed the rising costs of health insurance for employers in the 1990s.

The rapid escalating costs of health insurance are one of the largest employee health benefit concerns of employers. In 2006, of the average health insurance premium of \$4,242, employers paid approximately \$3,563, while employees paid the remainder. In the same year, both public and private employers spent roughly \$2.33 trillion on employee benefit programs, which is an almost 50% increase from 2000. Approximately 43.5% of the employee benefit payments were for health benefits. Small businesses face greater challenges in providing their employees with affordable health insurance due to the higher premiums they face because of their decreased bargaining power. As the cost of healthcare continues to increase, it is estimated that health benefits will surpass retirement benefit costs as the single largest employer expense for benefits.

To rein in costs, employers have reduced health benefits spending by increasing the level of employee cost sharing, reducing benefits, or eliminating coverage entirely. Many companies believe that they have no other option but to have employees pay for a greater portion of their health-related expenses.

Several reasons have been offered for encouraging employee cost sharing. It has been suggested that if employees shoulder a greater portion of their actual healthcare costs, they will be more sensitive to this cost and it will create financial incentives for individuals to make more cost-effective and informed decisions from the range of available options. Having employees directly contribute a greater portion of their health benefits may make individuals' behavior more cost sensitive, but it may also affect employees' ability to retain health insurance coverage. Another reason for employee contribution is that if it is required, then a company only needs to provide insurance for those employees who demand it. Therefore, the company is able to pass on any potential cost savings back to employees directly through higher wages. A consequence of this action, however, is adverse selection, where healthier and more affluent individuals benefit the most.

Employers have also been trying to implement new strategies to control costs. For example, high deductible health plans in combination with health savings accounts is a model of consumer-driven health plans that is gaining popularity but still accounts for only a relatively small portion of covered individuals. These types of consumer-driven health plans allow employees to put pretax dollars into special health savings accounts. Because of this type of arrangement, employees generally assume a larger share of their overall healthcare costs because they must decide what types of healthcare services they are willing to pay for. Again, these types of plans have been shown to result in risk selection, attracting healthier and more affluent individuals. Additionally, there are concerns that some individuals may delay seeking care and endanger their health because they are concerned about exhausting their health savings accounts.

Employers may also change the health benefits that are offered to employees by transitioning from a defined benefits package to a defined contributions package. This approach fixes the total amount that a company contributes toward an employee's benefits. Some companies have also implemented a pay-based contribution method, whereby lower-income employees receive a greater subsidy to help keep health insurance coverage affordable. Thus, employee contributions may vary according to the level of their salary or as a fixed percentage of their income. In 2005, about 8% of large employers incorporated the use of a pay-based strategy. A limitation of a pay-based strategy, however, is that it does not address the rising healthcare costs. Therefore, some employers may decide to opt out of providing insurance coverage entirely, and others may link employee contributions to lifestyle and behavior modifications that create incentives for individuals to reduce their health risks. Another extreme measure that some employers have taken includes imposing a spousal surcharge, which requires employees to pay an additional contribution to enroll their spouse, who already has available insurance coverage through another employer. Some employers may also decide to lock out spouses who have available coverage through their workplace.

As the cost of healthcare continues to rise, employer-sponsored health insurance may no

longer be financially feasible for many companies to offer since it has become extremely difficult for industries to remain competitive in a global market. Because of this, many researchers are convinced that there needs to be a fundamental shift in the way health insurance coverage is obtained in the United States.

Future Implications

Employers remain the largest source of health insurance coverage for the nation's citizens. In light of the tangible and intangible benefits that flow from employer-sponsored health plans, it should come as little surprise that health insurance reform is so difficult to achieve. The nearly 162 million persons who have employer-sponsored coverage highly value it, as measured in numerous public opinion surveys. Likewise, employers consider health benefits to be an important dimension of their employee compensation policies and an important means of attracting and retaining a competent workforce. Allegiance to employer-sponsored coverage thus has remained considerable, even as the nation has witnessed a significant decline in coverage over the past generation. The rising cost of healthcare and the economic decline have resulted in increased cost sharing by employees. To ensure access to the healthcare system, healthcare costs must be controlled and coverage must be made affordable. It is likely that any future reforms to the U.S. healthcare system will include an expansion of the current employer-based model.

Sara Rosenbaum

See also Compensation Differentials; Consumer-Directed Health Plans (CDHPs); Cost of Healthcare; Cost Shifting; Employee Retirement Income Security Act (ERISA); Flexible Spending Accounts (FSAs); Health Savings Accounts (HSAs); Tax Subsidy of Employer-Sponsored Health Insurance

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EMPLOYEE RETIREMENT INCOME SECURITY ACT (ERISA)

The Employee Retirement Income Security Act (ERISA), a federal law created in 1974, provides protection to individuals who participate in

voluntary private health and pension plans. Designed to establish minimum standards for these plans, ERISA requires plans to provide participants with important information about plan features and funding and provides fiduciary responsibilities for those who manage and control plan assets. The law requires plans to establish a grievance-and-appeals process for participants to get benefits from their plans. Importantly, it gives participants the right to sue for benefits and breaches of fiduciary duty. This entry discusses the history of employee benefits in the United States, examines the development of ERISA, explores the interpretation of the federal legislation, and highlights the likely role of ERISA in future public policy development.

History of Employee Health Benefits

In the United States, employer-sponsored health benefits represent a central source of health insurance for the working-age population and, to a lesser extent, retirees. In 2005, nearly 162 million persons, more than 93% of all persons with private health insurance, were covered by an employer-sponsored health plan, either as direct plan participants or as the beneficiaries of a participant's plan. Because the provision of health benefits is a matter of discretion on the part of employers, health insurance coverage follows distinct patterns linked to family income: The higher the family income, the more likely the presence of benefits.

Similarly, because the U.S. tax code extends favorable economic treatment to health insurance only when purchased through employer-sponsored plans, lower-income persons, the very individuals least likely to have employer-sponsored benefits, also have no tax subsidies available to help offset the cost of securing individual coverage. Furthermore, even when individuals can find affordable plans in the individual marketplace, coverage may be highly restricted and may contain provisions that exclude any coverage of healthcare needs deemed by the insurer to relate to preexisting medical conditions. As a result, access to benefits in the workplace is a significant determinative of coverage.

Employer-sponsored coverage has been referred to as the "accidental system," because its origins can be traced to a decision to exclude employer

contributions to coverage from family income during World War II, when strict wage and price controls were in effect. This decision was formalized as part of the Internal Revenue Code Amendments of 1952, following which the proportion of persons with employer-sponsored coverage began a dramatic climb, reaching its apex in the mid-1970s. Changes in labor patterns, family composition, and the underlying economy have all contributed to the slow erosion of the system, along with a more precipitous decline in the number of retirees. In the early 1990s, two thirds of all retirees had employer-sponsored coverage; by 2005, this figure had declined to one third.

Benefits sponsored through employers create several distinct advantages for covered persons and are both tangible and intangible. First, because coverage is based on a group, the cost of coverage is significantly lower and coverage is significantly more generous than coverage obtained on an individual basis. Second, under the provisions of the U.S. tax code, whose roots trace back to World War II, employer contributions to coverage are excluded when calculating taxable income, thereby greatly reducing the cost of coverage. Cash wages may also be lower in recognition of this contribution to income. Third, many employers have adopted tax-advantaged arrangements that permit employees to contribute toward their own premium costs, where applicable, on a pretax basis, further reducing the cost of coverage. Fourth, many employers now offer tax-advantaged savings accounts in conjunction with, or in addition to, health benefit plans, thereby further reducing employee healthcare costs by permitting employees to contribute to these accounts and purchase uncovered healthcare on a pretax basis.

Actual revenue losses to the U.S. Treasury resulting from employer-sponsored health plans are considerable, surpassing \$200 billion in 2006 alone. Furthermore, since state tax codes generally mirror the U.S. tax code where employer-sponsored income is concerned, revenue losses actually are significantly higher.

Finally, of course, health insurance coverage has an incalculable value to covered individuals because it protects them against economic loss from both foreseeable and unforeseeable healthcare expenditures. Traditional notions of insurance would limit coverage to losses related to unanticipated events,

such as serious illness or injury, but it is also customary for employer-sponsored plans to cover at least some level of preventive and primary-care health benefits, such as well-child care, screening mammography, and immunizations. Employer-sponsored plans, in essence, function as tax-free means of supplementing family income.

In light of the tangible and intangible benefits that flow from employer-sponsored health plans, health insurance reform has been difficult to achieve. The nearly 162 million persons who have coverage value it highly, as measured in numerous public opinion surveys; likewise, employers consider health benefits to be an important dimension of their employee compensation policies and an important means of attracting and retaining a competent workforce. Allegiance to employer-sponsored coverage thus has remained considerable, even as the nation has witnessed a decline in coverage over the past generation. Between 1994 and 2005 alone, the proportion of U.S. residents with employer coverage declined from 69% to 63% in the case of the total population, and from 66% to 58% in the case of children under 18 years of age.

Table 1 illustrates the skewed nature of health insurance coverage in the United States, chiefly as a result of a system that treats health insurance as an aspect of employee compensation.

Uninsured persons show patterns that are essentially the inverse of those evident among persons with health insurance coverage. Uninsured persons, as well as their family members, are significantly more likely to be low-income workers. Most uninsured persons are uninsured for relatively lengthy periods of time, usually a year or more. Compensating public insurance benefits for lower-income uninsured persons generally are available under the Medicaid program only in the case of selected subgroups of low-income persons: low-income children under 18 years of age; low-income pregnant women; and single parents of children under 18 years of age, who are below 50% of the federal poverty level. Public coverage through Medicare and/or Medicaid may be available in the case of persons who are sufficiently physically or mentally disabled. Medicare is restricted to persons whose employment history meets the 40-quarter minimum work requirement contained in the Social Security Act, while Medicaid

is limited to persons who are poor enough to qualify for Supplemental Security Income (SSI), where earnings are at or below approximately 75% of the federal poverty level.

As a matter of federal law, the legal authority for the regulation of insurance, including health insurance, rests with the individual states. The federal law that established this authority in states is the McCarran-Ferguson Act of 1945. At the same time, ERISA, which was passed in 1974, essentially upends this proposition to a considerable extent without actually overturning the McCarran-Ferguson Act.

The States' Role in Health Insurance

Responding to a 1945 U.S. Supreme Court decision subjecting the insurance industry to federal regulation, the U.S. Congress moved rapidly to restore the primacy of states in insurance regulation through the passage of the McCarran-Ferguson Act. By the mid-1970s, all states to some degree regulated health insurance. State regulatory structures reached the financial aspects of insurance, such as plan capitalization and reserves, and the financial aspects of plan operations. State law also regulated marketplace conduct, prohibiting certain types of deceptive marketing practices. Finally, state laws regulated the content of insurance coverage through an increasing number of benefit mandates, including the requirement for coverage of at least a certain amount of inpatient mental health treatment.

These express state laws were aimed at the insurance industry and its nature, structure, and operations of insurance contracts. Numerous other state laws reached insurer behavior too. For example, state civil rights and human rights statutes prohibiting discrimination in the workplace were interpreted to prohibit employee benefit plans from reducing or eliminating disability coverage in the case of women whose disability was related to pregnancy. Similarly, by the late 1970s, many states had laws that permitted persons alleging injuries caused by the deliberate and unfair claims denial practices of insurers to bring suit for "bad faith breach of contract" and to seek compensatory and noneconomic damages as part of their remedy. A few states, most notably California, recognized that insurers could be sued for corporate medical negligence in cases in which

Table I U.S. Private Health Insurance Coverage Through the Workplace Among Persons Under Age 65, by Percentage and Selected Characteristics, 2005

<i>Personal Characteristics</i>	<i>Percentage of the Population</i>
Total population treatment	63.1
Under 18 years of age	58.2
18–44 years of age	61.7
45–64 years of age	70.3
White only	65.6
Black/African American only	50.2
Hispanic or Latino	39.9
Below 100% of the federal poverty level	17.7
200% or more of the federal poverty level	78.3
Geographic region	
Northeast	70.2
Midwest	69.6
West	59.6
South	57.6

Source: *Health United States 2007*, Table 137.

prospective utilization of substandard management systems and procedures could be shown to be a proximate cause of injury or death.

In sum, even as ERISA moved to establish uniformity within the world of pension plans, a broad body of state law not only regulated the structure and content of insurance contracts, as well as contract administration, but also created rights and remedies for injuries arising from the maladministration of health insurance coverage in connection with prospective utilization review.

Requirements of ERISA

Enactment of ERISA in 1974 fundamentally altered the regulatory landscape. It also affected regulations following profound shifts in the health benefits marketplace, including the spread of prospective and concurrent utilization review and the growth of plans that effectively merge coverage and care through networked provider arrangements that give plans considerable control over actual access to care.

ERISA, which applies to all private employers, had as its central purpose the establishment of

uniform, national standards for the regulation of pension plans. Prior to ERISA's enactment, employers and unions had enormous discretion over the structure and operation of pensions, and state regulation of pension plans varied from weak to nonexistent. Following a series of spectacular pension plan failures, the U.S. Congress enacted legislation that established a unified federal approach to the vesting, funding, and operation of pension plans, a mechanism for guaranteeing pensions to secure pension rights, and a strict fiduciary standard against which to measure the legality of pension plan administration.

The enactment of ERISA involved virtually no discussion of health benefits, which simply were classified as a part of employer-sponsored "welfare benefits" and thus were to be subject to the terms of the statute. Unlike its pension provisions, however, ERISA established virtually no substantive statutory terms where welfare plans were concerned, and the intervening years have seen the enactment of very little in the way of statutory minimums with respect to health plan content and structure, health plan operations, and patient and consumer protections.

ERISA Reforms

While the original legislation did not include many statutory terms for health plans, one notable exception is the continuation of health insurance coverage, which was established as part of the federal Consolidated Omnibus Budget Reconciliation Act of 1985 (COBRA). Continuation of coverage applies to employers with 20 or more full-time employees and requires employer health plans to permit persons who lose their health plan participant or beneficiary status as a result of certain qualifying reasons (e.g., the death of the covered worker, loss of job, divorce) to continue to purchase group health insurance coverage on a full-premium, unsubsidized basis.

The Health Insurance Portability and Accountability Act of 1996 (HIPAA) also provides limited health insurance protections. Portability permits individuals who amass creditable coverage under one employer, and who meet certain other conditions, to change jobs without having to satisfy preexisting requirements and waiting periods under a subsequent employer plan. These rights also permit movement by individuals into the individual insurance market following exhaustion of their COBRA benefits, without being subject to the preexisting-conditions exclusions that characterize individual policies. Portability does not, however, address the basic affordability of individual coverage or its postcoverage limitations.

A third example of ERISA reform concerning health benefits came in 2000, during a period of intense and ultimately unsuccessful legislative debate over patients rights in managed-care arrangements. That year, the U.S. Department of Labor promulgated regulations that added considerable rigor to the obligations of health plans when individuals appeal decisions denying or terminating benefits. In addition, the 2000 “full and fair” hearing regulations established important limitations on the amount of time that plans can take in making coverage determinations, in recognition of the adverse effect that prospective and concurrent utilization review can have on healthcare access. Prospective utilization management was essentially unheard of at the time of ERISA’s enactment in 1974, as was the use of network-style health insurance. At the time, 90% of the insured workforce was covered by indemnity insurance plans that, at

most, used postclaims review procedures to determine medical necessity.

Outside these few examples and a handful of additional minor requirements, ERISA is effectively devoid of structural requirements related to the structure or administration of health benefit plans offered by employers. Despite this fact, however, an obscure provision of ERISA, known as the preemption statute, allows federal law to override state regulations by preempting state laws that “relate to” employer-sponsored benefit plans.

Preemption Under ERISA

Under the preemption statute of ERISA, laws are considered preempted if they attempt to compel plan design or place a direct burden on plan administration; on the other hand, laws that create indirect economic burdens, such as a tax on healthcare services, are not considered to relate to plans for purposes of preemption.

In addition, the ERISA preemption statute “saves” state laws that regulate insurance. However, self-insured health benefit plans, which account for over half of all persons with employer-sponsored coverage, are not considered to be insurance. Thus, they are shielded from state insurance laws that apply to the health insurance industry and regulate the insurance contract.

The preemptive effects of ERISA do not end with the so-called preemption statute. ERISA also establishes an exclusive means by which individuals can challenge wrongful plan conduct. As noted, when a claim arises involving benefits that allegedly are due to a patient under the terms of the plan, the patient can seek a full and fair review by the plan and can go to court to secure his or her benefits or to enjoin a future wrongful plan conduct. But ERISA’s remedial provisions contemplate no means for recovering damages in the event of injury. When an employer-sponsored plan, whether a large self-insured plan or a smaller plan that purchases state-regulated insurance and delegates administrative powers to the insurer, makes a bad-faith or negligent coverage decision that results in injury or death, claimants are cut off from all available damage remedies under state law. In effect, ERISA shields employer-sponsored health plans from the consequences of negligent or wrongful

conduct, a fact that the U.S. Congress has attempted to address by means of legislative amendments.

ERISA's shielding powers came to light in a historic case involving the death of an infant after the mother's health plan refused to preapprove her inpatient admission prior to delivery so that her high-risk pregnancy could be managed more appropriately. Despite the fact that state law would have given her the right to seek economic and noneconomic damages arising from the loss of her baby, the federal courts ruled that ERISA's exclusive remedial provisions served to preempt all state remedies other than those specified in the ERISA statute itself. Although the plan's decision directly implicated the woman's access to healthcare itself, the conduct was held to be a function of plan administration, since prospective utilization review is simply an aspect of modern health insurance operations.

At the same time, this shield has its limits. In those situations in which an injured person can demonstrate to a court that the injuries arise out of the quality of care, as in the performance of a health professional or hospital in a health plan's provider network, the courts consider this type of claim to be one that seeks damages for the quality of the care furnished rather than for benefits that allegedly are owed under the terms of the plan.

Despite this exception for quality claims, as well as the limits of preemption in the case of state laws that have only an indirect economic impact on ERISA health benefit plans, ERISA is understood to have a broad sweep, prohibiting state health reforms that compel certain types of health plan conduct. For example, a state cannot compel an employer to offer health benefits. The State of Hawaii does so pursuant to an express waiver of ERISA, granted in consideration of the fact that the Hawaii law predated ERISA and was immediately overturned following the federal enactment. Similarly, it would appear that a state cannot compel an employer to either offer a health benefit plan or pay into a pool, although the legality of such an approach has not yet been definitively addressed by the U.S. Supreme Court.

Future Implications

The enactment of ERISA in 1974 sought to protect participants in employee-sponsored pension

and health plans. It has many implications in the health insurance marketplace, and its modification becomes a crucial consideration in national health reform, particularly in the case of reform plans that contemplate a strong state role in the establishment or regulation of employee health benefit plans. Similarly, ERISA determines the extent to which individuals who allege injury as a result of substandard plan administration in the area of coverage determinations have access to economic or noneconomic damages. A better understanding of ERISA and its interpretations will help inform any future reform efforts.

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See also Access to Healthcare; Healthcare Reform; Health Insurance; Health Insurance Coverage; Public Policy; Regulation; State-Based Health Insurance Initiatives; Uninsured Individuals

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ENTHOVEN, ALAIN C.

Alain C. Enthoven is a leading figure in the field of health economics and is regarded as the father of managed competition. He was also a cofounder of the Jackson Hole Group in Teton Village, Wyoming, a healthcare reform policy think tank, which was composed of medical, public policy, and business leaders committed to improving the nation's healthcare system. Enthoven is currently the Marriner S. Eccles Professor of Public and Private Management, emeritus, at the Stanford Graduate School of Business, and a core faculty at the Center for Health Policy/Center for Primary Care and Outcomes Research at Stanford.

Enthoven was born in 1930 in Seattle, Washington. He received his bachelor's degree from Stanford University in 1952, his master's degree from Oxford University in 1954, and a doctorate degree from the Massachusetts Institute of Technology in 1956—all in economics. From 1956 to 1960, Enthoven worked as an economist at the RAND Corporation. Following this, he worked at the U.S. Department of Defense, which ultimately culminated in his appointment by President Lyndon B. Johnson as assistant secretary of defense for systems analysis in 1965. In 1969, Enthoven entered the corporate world, taking a position as vice president of economic planning for Litton Industries, and in 1971 he became the president of Litton Medical Products. In this position, he began his work in health economics. In 1973, Enthoven became a professor at Stanford University, where he currently remains.

During his distinguished career, Enthoven has received numerous awards, appointments, and recognitions for his accomplishments in the field of economics. President John F. Kennedy presented Enthoven with the President's Award for Distinguished Federal Civilian Service in 1963. Enthoven also received the Baxter Health Services Research Prize from the Association for University Programs in Health Administration (AUPHA) in 1994 for his work on managed competition. In the same year, he was awarded the Clifton J. Latiolais Honor Medical from the American Managed Care Pharmacy Association. Enthoven also received the Board of Directors Award from the Healthcare Financial Management Association (HFMA) as

well as the Paul Ellwood Award for Efforts in Health Care Accountability from the Foundation for Accountability (FACCT).

Enthoven was a Rock Carling Fellow with the Nuffield Trust of London from 1998 to 1999 and is a former Rhodes Scholar. He is also an elected member of the National Academy of Sciences, Institute of Medicine (IOM), and a fellow of the American Academy of Arts and Sciences.

Throughout his career, Enthoven has been deeply involved with healthcare policy at both the state and federal levels. In 1977, while serving as a consultant to President Jimmy Carter, he proposed a plan for universal health insurance, called Consumer Choice Health Plan, the basis of which was managed competition. He also has served as Chairman of the Health Benefits Advisory Council for the California Public Employees Retirement System and was appointed Chairman of the California Managed Care Health Improvement Task Force, which was charged with the responsibility of studying healthcare issues created by managed care.

Enthoven has published widely on issues related to the economics, management, and public policy of healthcare, both in the United States and in the United Kingdom. The major focus of Enthoven's research has been to examine the root causes of the rapid escalation in healthcare costs and national health expenditures and to investigate strategies to mitigate these increases while improving the quality of care. He is currently developing a proposal for a market-based universal health insurance system.

Alyssa Howell

See also Cost of Healthcare; Ellwood, Paul M.; Healthcare Reform; Health Economics; Health Insurance; Managed Care; National Health Insurance; Public Policy

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EPIDEMIOLOGY

The term *epidemiology* is derived from the Greek roots *epi* meaning on or upon, *demos* meaning the common people, and *logy* meaning the study of. Epidemiology is defined as the study of diseases in human populations, their causes, and their means of prevention. The term *disease* in the definition refers to a broad array of health and medical problems, including disability, injury, and death.

Epidemiology differs from clinical medicine in a number of ways. It studies groups of people, not just individuals. Epidemiology also studies both well people and people with disease to identify the crucial differences between those who are stricken and those who are spared. These differences are compared to identify the underlying causes or etiologies of disease. While the goal of clinical medicine is to diminish pain, restore function, and bring the patient back to full health, the main goal of epidemiology is to understand the causes of diseases in order to prevent them from occurring.

Epidemiology addresses many areas of public health. For example, it studies the natural history and prognosis of disease. It is used to measure the extent and burden of disease within communities, states, and nations. Epidemiology is also frequently

used to evaluate therapeutic and preventive health measures, such as determining the effectiveness and safety of health-screening programs, new drugs, and vaccines. Public policymakers, government agencies, health insurance companies, hospitals, physicians, and others increasingly rely on epidemiology as the foundation for making sound decisions to protect the public's health.

The field of epidemiology is highly interdisciplinary. It relies heavily on the concepts, knowledge, and theories of disciplines such as biology, pathology, and physiology in the health and biomedical sciences, as well as the disciplines of anthropology, psychology, and sociology in the behavioral and social sciences. Epidemiology is also very closely tied to the discipline of statistics, particularly biostatistics. Within the basic discipline of epidemiology, there are several core subfields that have emerged over time. For example, scientific progress in the field of molecular genetics has spawned a relatively new area of study called genetic epidemiology. Epidemiologists focusing their efforts in this area are concerned with determining how newly discovered genes interact with the host and environment to produce complex disease. Other subfields within epidemiology include infectious disease epidemiology, chronic disease epidemiology, cancer epidemiology, occupational epidemiology, and social epidemiology.

History

Epidemiology is a relatively new science that emerged in the 19th century. However, its historical development spans thousands of years and is best described as slow and unsteady. Over the centuries, many individuals have contributed to the establishment of the modern field of epidemiology.

The first important individual was the Greek physician Hippocrates (428–347 BCE), who is traditionally regarded as the father of Western clinical medicine. Hippocrates wrote the first epidemiologic texts *Epidemic I*, *Epidemic III* and *On Airs, Waters, and Places*. In these works, he was the first person to attempt to explain the occurrence of disease on a rational rather than a supernatural basis. Since Hippocrates recognized disease as a mass phenomenon as well as one affecting individuals, he is recognized as the first epidemiologist.

Another figure of importance was the English statistician John Graunt (1620–1674). Graunt was the first person to analyze the *Bills of Mortality*, which recorded the weekly count of births and deaths in London. In 1662, Graunt published the results of his findings in *Natural and Political Observations Made Upon the Bills of Mortality*. He found that male births consistently outnumbered female births yet males no longer outnumbered females by the time they reached childbearing age because males experienced higher mortality rates. Graunt also constructed the first life table, a statistical table that uses death rates of a cohort of persons to determine the group's average life expectancy.

James Lind (1716–1794), a Scottish naval surgeon, also helped establish epidemiology. Lind studied the great sea plague scurvy. On long naval voyages, scurvy often killed two thirds of a ship's crew. To prevent scurvy, Lind conducted the first planned controlled clinical trial, supplementing the diet of a small number of sailors with fresh citrus fruit and lemon juice (the experimental group). He then compared the incidence of scurvy among these men with that of other sailors on the same ship who ate the normal vitamin-poor naval diet (the control group). Finding that citrus fruit prevented the disease, Lind recommended dietary changes for all sailors, which ultimately resulted in the eradication of scurvy from the British navy. Hence, British sailors are still referred to as "limeys."

Edward Jenner (1749–1823), a British surgeon who practiced medicine in the small village of Berkeley in Gloucestershire, England, observed that milkmaids who developed cowpox (a mild disease) never contracted the severe and often disfiguring and deadly disease smallpox. Using matter drawn from the lesions of cowpox on the hand of a milkmaid, Jenner performed the first vaccination. In time, the practice of vaccinating for the prevention of smallpox became widespread. Today, smallpox is the only disease to ever be totally eradicated from nature. And vaccination is a widely used method to prevent the occurrence of many diseases.

William Farr (1807–1883), a British physician who worked as the first compiler of scientific abstracts at the Registrar General's Office in London, helped shape England's vital statistics

system. His most important contribution to epidemiology was the establishment of a sophisticated system for classifying the causes of death. This enabled the comparison, for the first time, of mortality rates among different demographic and occupational groups. Farr's classification system still forms the basis of the International Classification of Disease and Related Health Problems (ICD) that is in use today.

Another great pioneer in the field of epidemiology was John Snow (1813–1858). Snow, a contemporary of William Farr, was a well-respected London physician who specialized in obstetric anesthesiology. One of his patients was Queen Victoria, whom he assisted in the delivery of two of her children. Snow became interested in the cause and spread of cholera epidemics that periodically occurred in London. In 1854, when a severe cholera epidemic once again struck the city, Snow undertook an investigation. At the time, most physicians attributed the disease to miasma or "bad air" formed from decaying organic matter. Snow, however, held the radical view at the time that cholera was caused by drinking fecal-contaminated water. Snow started his investigation by plotting the geographic location of all cholera deaths in London. When he found a large number of deaths (more than 500 in a 10-day period) clustered around a public water hand pump on Broad Street in the Soho District of west London, he informed the local authorities, along with his hunch as to the cause. Although the authorities were skeptical, the next day they had the pump disabled by removing its handle. Immediately, new cases of cholera started to dwindle and then disappear. However, because cholera deaths were already declining in the city, Snow was unable to attribute the end of the outbreak directly to the removal of the pump handle. Snow doggedly continued his investigation of cholera and conducted what he called his Great Experiment. To conduct the "Experiment," Snow painstakingly documented the cholera deaths (nearly 1,400) among the subscribers of London's two independent private water companies. The Southwark and Vauxhall Company (which supplied more than 40,000 homes) drew its water from the sewage-polluted lower Thames River, while the Lambeth Company (which supplied more than 25,000 homes) obtained its water farther upriver. Snow conclusively showed that the

number and rate of cholera deaths were much higher for residents in homes served by the Southwark and Vauxhall Company, which supplied the polluted water. Using meticulously gathered data and the power of statistics, Snow brought about the beginning of the end of cholera in Britain. Because of his study methods and insights, Snow is generally regarded as the father of modern epidemiology.

Basic Concepts and Tools

Epidemiology has two fundamental assumptions. First, disease does not occur at random. Second, disease has causal and preventive factors.

Epidemiologists often use models to explain the occurrence of disease. One commonly used model views disease in terms of susceptibility and exposure factors. Specifically, for individuals to develop disease, they must be both susceptible to the disease and exposed to it. For example, for a person to develop measles (rubeola), a highly infectious viral disease that was once very common among children, he or she must both be exposed to a person who is shedding the measles virus (an active case) and be susceptible to measles because of lack of immunity to it. Immunity to measles may be derived from either previously having the disease or from being vaccinated against it.

Another commonly used model, the epidemiologic triad, views the occurrence of disease as the balance among the host, agent, and environmental factors. The host is the actual or potential recipient or victim of the disease. Hosts have characteristics that either predispose them to or protect them from disease. These characteristics may be biological (e.g., age, sex, and degree of immunity), behavioral (e.g., habits, culture, and lifestyle), or social (e.g., attitudes, norms, and values). The agent is a factor whose presence or absence is necessary for a particular disease to occur. Agents may be biological (e.g., bacteria, fungi, and viruses), chemical (e.g., gases and toxic agents), nutritional (e.g., carbohydrates, fats, and food additives), or physical (e.g., electricity and ionizing radiation). The environment includes all external factors, other than the host and agent, that influence health. The environment may be categorized as the social environment (e.g., economic, legal, and political), the

physical environment (e.g., precipitation, temperature, and weather conditions), or the biological environment (animals and plants). To illustrate the epidemiologic triad, consider a case of lung cancer. The host is the person who developed lung cancer. He or she may have had the habit of smoking for many years. The agent is the smoke, tars, and toxic chemicals contained in the tobacco. Environment may have been the workplace where smoking on the job was permitted and cigarettes or other tobacco products were readily available.

Epidemiologists classify the type of disease cases and frequency of disease occurrence within a population as being either endemic or epidemic. Endemic is defined as the usual occurrence of a disease within a population. In contrast, an epidemic is the occurrence of disease, often developing suddenly, that is clearly in excess of the level that normally occurs within a population. It may also be the first occurrence of an entirely new disease. A special type of epidemic is the pandemic, which is a rapidly emerging outbreak of a disease that affects a wide range of geographically distributed populations. Many pandemics are worldwide in scope. To illustrate these terms, a small number of people develop the flu (influenza) in a large city throughout the year, and these would be endemic cases of the disease. In contrast, the number of people contracting the flu in the same city may increase enormously in the fall, and these would represent epidemic cases. Last, if a new variety of flu emerges and people throughout the world get sick from it, they would be pandemic cases. An example of a pandemic is the great influenza outbreak of 1918, which spread throughout the world, killing an estimated 20 to 40 million people.

Epidemiologists study the morbidity and mortality caused by acute and chronic diseases. Morbidity is defined as the state of illness, symptoms, or impairments produced by a disease, while mortality is death caused by a particular disease. Acute diseases are those that strike and disappear quickly, within a month or so (e.g., chicken pox, colds, and the flu), while chronic diseases are those that are long-term or lifelong diseases, many of which are incurable (e.g., cancer, diabetes, and HIV/AIDS).

One of the most important measurement tools of epidemiology is the use of morbidity and mortality rates. Epidemiologists use rates so that the number of disease cases and deaths can be

compared with a certain number of people at risk in a population. Although strict use of the term *rate* is not always observed, a rate is a special type of proportion that includes a specification of time. Thus, a rate indicates the proportion of people in a population who experience an event during a specified period of time. Rates can be expressed in any form that is convenient (e.g., per 100 per week, per 1,000 per year, per 10,000 per year, per 100,000 per month). Infant mortality rates, for example, are often expressed per 1,000 live births, while cancer rates are often expressed per 100,000 population. Any meaningful number may be used in the denominator, however.

The following example illustrates the important role rates play in making epidemiological comparisons. Assume that City A has 10 cases of a disease while City B has 50 cases. Although in terms of absolute numbers City B has five times more cases of the disease than City A, the differences may be due to the underlying population size of the two cities. To compare the occurrence of disease in the cities on a unit population basis, rates must be calculated. If City A has a population of 10,000 and City B has a population of 50,000, the disease rates per 1,000 people would be the same for both cities. City A's disease rate is $(10/10,000) \times 1000 = 1.0$ case per 1,000 population, and City B's disease rate is $(50/50,000) \times 1000 = 1.0$ case per 1,000 population. Of course, a valid comparison here also presumes that disease occurrence is being measured over the same amount of time.

Rates may be crude, specific, or adjusted. Crude rates use the total number of disease cases and the entire population in their calculations. For example, the above rates for City A and City B are crude disease rates. Specific rates differentiate cases and populations into age, sex, race, or other subgroups. For example, if the rates for City A and City B were for persons with disease who were 25 to 34 years of age divided by the total number of people in each city who were 25 to 34 years of age, the rates would be age-specific disease rates. Specific rates can be applied to very narrowly defined segments of a population. For example, one could calculate an age/sex/race-specific disease rate (e.g., the number of persons with disease who are African American, male, and aged 25–34 years divided by the total number of people in the population who are African American, male, and aged 25–34

years). Basically, adjusted or standardized rates allow for comparison of populations that have different demographic characteristics. To calculate adjusted rates, summary adjusted rates are used to remove age, sex, or race differences in populations. For example, in the United States, the population of Florida (a state where many people go to retire) is much older than the population in Alaska. Thus, it would be inappropriate to compare the mortality rates of the two states without adjusting for the differences in their age structures.

Two measures that epidemiologists frequently use to describe the occurrence of disease include incidence and prevalence. Incidence measures the rapidity at which new cases of a disease are occurring in a population over a specified period of time. Since incidence always includes a specified period of time during which new cases occur, it is another type of rate. The incidence rate is an important measure for evaluating disease control programs; an example incidence rate could be stated as follows: 10 new cases of Disease X per 100 people per year. Epidemiologists in health departments, for example, study the incidence rates of HIV/AIDS to determine if the disease is spreading and whether AIDS prevention programs are working.

Prevalence measures the total number of *existing* cases of a disease in a population at a given point of time ("point prevalence") or sometimes within a period of time ("period prevalence"). Prevalence can be a useful indicator of the burden of disease on the medical and social systems of a geographic region. Prevalence is often expressed as a proportion. For example, if 100 people in a small town of 1,000 people had hypertension at a particular point in time, then the prevalence of hypertension in the population would be 0.1, or 10%. Epidemiologists at the World Health Organization (WHO), for example, use prevalence measures to describe the medical, economic, and social burden of AIDS in developing countries.

There is a relationship between incidence and prevalence. Prevalence directly varies with both the incidence and the duration of disease. If the incidence of a disease is low but the duration of the disease is long, such as with chronic diseases, the prevalence will be large in relation to the incidence. Conversely, if disease prevalence is low because of short duration due to migration, death, or quick

recovery, then prevalence will be small relative to incidence.

Sources of Epidemiological Data

Epidemiologists use primary and secondary data sources to calculate disease measures and conduct studies. Primary data are the original data collected for a specific purpose by or for an investigator. For example, an epidemiologist may collect primary data by interviewing people who became ill after eating at a restaurant, to identify which foods they ate. Collecting primary data is expensive and time-consuming, and it usually is undertaken only when secondary data are not available. Secondary data are data that have already been collected for another purpose by other individuals or organizations. Examples of secondary data commonly used by epidemiologists include birth and death certificates, population census records, hospital and clinic patient medical records, data from disease registries, insurance claim forms and billing records, public health department case reports, and surveys of individuals and households.

An important source of secondary data is the Centers for Disease Control and Prevention (CDC). The CDC, which is an agency of the U.S. Department of Health and Human Services, consists of 12 centers, institutes, and offices. The various centers collect a wide array of epidemiological data on problems such as birth defects and developmental disabilities, chronic diseases, infectious diseases, injuries, work-related injuries, and sexually transmitted diseases. Within the CDC, the National Center for Health Statistics (NCHS) conducts, publishes, and widely disseminates the results of numerous health surveys of individuals and healthcare organizations. Examples of NCHS surveys include the National Health Interview Survey, the National Health and Nutrition Examination Survey, the National Hospital Discharge Survey, and the National Nursing Home Survey.

Descriptive and Analytical Epidemiology

The field of epidemiology can be divided into two broad categories: descriptive epidemiology and analytical epidemiology. Descriptive epidemiology

characterizes the distribution of disease within a population. It describes the person, place, and time characteristics of disease occurrence. It specifically asks the questions “Who is getting the disease? Where is the disease occurring? When is the disease occurring?”

A typical example of descriptive epidemiology is an investigation whereby the health status of a population is determined via the administration of a health survey. Through detailed interviews, medical examinations, and the extraction of data from medical records, the epidemiologist may be able to determine a variety of characteristics of the population, such as who suffers from diabetes, hypertension, heart disease, cancer, disability, and so on. Using these data to develop hypotheses about the environmental causes of disease may be possible. These data might also be used to help policymakers decide on how to distribute resources that could best serve the population living in the area.

Analytical epidemiology, on the other hand, tests hypotheses to determine if statistical associations exist between suspected causal factors and disease occurrence. It also tests the effectiveness and safety of therapeutic and medical interventions. To accomplish these tasks, analytical epidemiology uses four major types of research study designs: cross-sectional studies, case-control studies, cohort studies, and controlled clinical trials. Each of these types of studies has strengths and weaknesses.

Cross-sectional studies examine the relationship between disease and other variables of interest as they exist in defined populations at one particular time. For example, a cross-sectional study investigating whether residential exposure to the radioactive gas radon increases the risk of lung cancer may examine the current level of radon gas in lung cancer patients' homes. Cross-sectional studies have the advantage of being inexpensive and simple to conduct. However, their main disadvantage is that they may not establish causality because exposures are only measured once disease has already occurred. To establish causation, it would be important to measure exposure over a period of time prior to the onset of disease so that exposure status could be measured and contrasted among those who did and did not develop the disease.

Case-control studies start with people who already have a particular disease (cases) and a suitable control group without the disease and then compare

the exposures that have occurred among the cases and controls. If an exposure is truly related to development of the disease of interest, then it will have occurred more frequently among the cases than the controls. These types of studies are most useful for ascertaining the cause of rare events, such as certain cancers. For example, to determine whether the use of cellular telephones causes head cancers, a group of head cancer patients (cases) would be compared with a group of individuals without head cancers (controls). The two groups would then be compared with respect to the proportion that used cellular telephones and their level of exposure (i.e., how many minutes they talked over the telephone per day). Case-control studies have the advantages of being quick to conduct and inexpensive, and they may require only a small number of cases and controls to determine an association. However, their main disadvantage is that they rely on recall or some estimate of an exposure that has already occurred in the past. These can lead to misleading and biased results.

Cohort studies are observational studies in which a defined group of people (the cohort) is followed over time and outcomes are compared for individuals who were exposed or not exposed to different levels of some factor. Cohorts can be assembled in the present and followed into the future (a prospective cohort study) or identified from past records (historical or retrospective cohort study). An example of a cohort study is the Framingham Heart Study. The Framingham study is the longest ongoing epidemiological study in the United States. Starting in 1948 with an original cohort of 5,200 adult volunteers from Framingham, Massachusetts, the study has followed the volunteers and their offspring to identify the risk factors associated with developing heart disease (e.g., cholesterol levels, smoking, obesity, and diabetes). To date, the results from this landmark cohort study have been published in more than 1,000 scientific papers. The main advantage of cohort studies is that they can establish the timing and directionality of events. However, their main disadvantages are that they require large sample sizes and a long follow-up time and they are not typically suitable for investigating rare diseases unless extremely large populations are studied.

Controlled clinical trials are studies that test therapeutic drugs or other health or medical interventions to assess their effectiveness and

safety. Controlled clinical trials compare the outcomes of new drugs or interventions given to an experimental group versus another group (control) that does not receive the same drugs or interventions. To minimize bias, individuals involved in clinical trials may be randomly assigned to the experimental and control groups. For example, to determine whether a new drug to treat breast cancer is more effective than another drug, breast cancer patients would be assigned randomly into either an experimental group that receives the new drug or the control group that receives the other drug. The outcomes of the two groups (e.g., the number of remissions and increase in survival time) would then be compared. In the United States, and many other countries, all new therapeutic drugs are subjected to rigorous controlled clinical trials before they can be provided to the public. The main advantage of controlled clinical trials is they provide unbiased results. However, their main disadvantage is that they are very expensive to conduct.

Future Implications

During the past several decades, the field of epidemiology has greatly expanded in size, scope, and influence. The number of epidemiologists has grown rapidly along with epidemiology programs in schools of public health and medicine. Today, epidemiologists investigate the outbreaks of acute diseases, such as food-borne epidemics. They also investigate the outbreaks of new emerging diseases such as SARS and reemerging older diseases such as tuberculosis. At the same time, epidemiologists study the underlying causes of many chronic diseases such as cancer, heart disease, and stroke. They also study the causes of psychiatric disorders, substance abuse, and social problems such as violence. Since the recent terrorist attacks in the United States, Europe, and Japan, many epidemiologists are involved in planning and implementing health surveillance programs to detect and prevent possible bioterrorism attacks. Epidemiologists are also just beginning to examine the determinants of health at the molecular and genetic levels. They are studying how individual genes influence the risk of developing chronic conditions such as Alzheimer's disease. And epidemiologists are beginning to develop new molecular

markers to improve the measurement of individually specific exposure and susceptibility factors.

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See also Acute and Chronic Diseases; Disability; Disease; Health; Morbidity; Mortality; Public Health; Risk

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<http://www.cdc.gov>
- Epidemiology.net: <http://www.epidemiology.net>
- Epidemiology Virtual Library:
<http://www.epibiostat.ucsf.edu/epidem/epidem.html>

- International Epidemiological Association:
<http://www.dundee.ac.uk/iea>
- Society for Epidemiologic Research:
<http://www.jhsph.edu/Publications/JEPI/ser.html>

E-PRESCRIBING

E-prescribing or electronic prescribing systems include the ability of entering prescription data intended for ambulatory use into a computer system and then either printing a copy of the prescription or, as a preferred mechanism, communicating the data elements of the prescription directly to the filling pharmacy's computer system. These systems, whether in the hospital as part of an automated medication order entry process or in the ambulatory environment through the use of a handheld technology device, provide benefits to both clinicians and patients. They provide a quicker way for prescription data to be in the pharmacy, thereby eliminating delays in prescription processing caused by illegible handwriting and data entry. This results in a reduction in medication errors and, ultimately, should reduce overall medication costs for the patient through better drug use.

Typically, e-prescribing systems permit the clinician to use the extensive drug resources supplied by software companies in order to confirm drug information, including drug availability, dosing, indications, contraindications, and drug interactions, and have access to monograph and journal article references. In more comprehensive systems, clinicians can check intended medications against the patient's current medication profile and/or insurance company drug formulary, all at the point of care. Additionally, clinicians may benefit by using the software to stay current with information on new medications, pharmacokinetics, and other treatment protocols.

Background

The Medicare Prescription Drug, Improvement, and Modernization Act (MMA) of 2003 had a profound legislative and regulatory impact on e-prescribing. The act provides a prescription drug

benefit (under Part D) to Medicare enrollees and also includes the requirement for standards to be adopted for the voluntary use of e-prescribing as well as proposed relief to antikickback laws that may support various e-prescribing arrangements. Additionally, the act tasked the National Committee on Vital and Health Statistics with recommending appropriate messaging standards for the exchange of e-prescribing data. The committee developed an initial set of recommendations for e-prescribing data standards in September 2004, and they have been through the regulatory process, with a final rule issued in November 2005.

Utility of the Systems

There are several major factors that affect the utility of e-prescribing systems in actual practice. Specifically, the data in the systems must be accurate. Clinicians will be making decisions based on the data; thus the source systems must provide accurate data through working interfaces. Second, the software must be reliable. Clinicians must be confident that the software works as intended. Medication and patient data must be readily available at the point of care when the clinicians intend to make decisions. Third, since clinicians often use acute care for discharge and emergency department prescriptions, uniform standards in both acute care and ambulatory environments must exist. The HL7 interface standard is currently used in most acute-care systems while the National Council for Prescription Drug Programs data and transmission standards are used in most retail pharmacy systems. There is a need for cross-communications to promote full interoperability of systems. Finally, the systems must be maintained with regular updates. Clinicians must be confident that all data content is regularly updated as scheduled.

Levels of Usage

According to the e-Health Initiative, there are six graduated levels of e-prescribing usage. The levels go from the basic (Level 1) to the most comprehensive (Level 6). In Level 1, the clinician uses a handheld hardware unit for basic electronic reference data, usually provided by drug reference

software without an automated prescription writing capability. In Level 2, the clinician uses a stand-alone prescription writer without integrated access to the patient's clinical data or supporting medication history. In Level 3, the clinician has the ability to access the patient's supporting data, such as demographic, allergy, formulary, and/or payer information prior to generating a prescription from a stand-alone prescription writer. In Level 4, the clinician has the ability to manage the patient's drug treatment by tracking and monitoring the patient's medication history and current medication usage. In Level 5, the clinician has the ability to communicate prescription data with pharmacies, payers to check drug formularies, pharmacy benefit managers who submit claims data, and other intermediaries. Finally, in Level 6, the clinician has full integration with a complete electronic health record that includes the ability to order and prescribe medications.

Barriers

While there is great potential for e-prescribing, the nation's healthcare industry has seen only limited adoption of these systems. According to the e-Health Initiative, in 2004, less than 20% of physicians used e-prescribing. Given the fact that there are more than 3 billion prescriptions written annually in the United States, other studies have suggested that the national savings from the universal adoption of e-prescribing systems could save as much as \$25 to \$30 billion. Some of these savings are from prevention of adverse drug events, reduced hospitalizations and ambulatory visits, use of generic drugs, and formulary compliance, with an overall reduction in the use of prescription drugs.

This limited adoption is the result of barriers that have been reported when implementing e-prescribing systems, which have prevented the full realization of their benefits. Specifically, seven major barriers have been identified.

First, e-prescribing systems are perceived to be slower than other manual systems, and clinicians complain of lower productivity. The increased time clinicians take to use electronic prescribing requires them to spend more time with each patient, which decreases the number of patients who can be seen per unit of time, thus potentially reducing overall

income. Clinicians have had substantial experience manually writing prescriptions in a matter of seconds, and most physicians will continue to hand-write prescriptions because it is perceived to be quicker than using a computer. In spite of the quality and other benefits to be realized from electronic prescribing, until the automated process is deemed quicker, this barrier will be cited.

Second, lack of connectivity with other providers, particularly retail pharmacy outlets, is limiting the full utilization of e-prescribing. Many times, handheld e-prescribing systems do not integrate with all pharmacy computer systems, resulting in manual entry for some cases and the increased possibility of medication errors in spite of the clinician's best intentions. While many of the retail pharmacies are working hard to become e-prescribing certified, this is a difficult and slow process.

Third, the purchase of e-prescribing technology is often not the only capital investment under consideration in most ambulatory medical practices and hospitals. In an environment of decreasing reimbursements, many clinicians and hospitals feel that there is limited capital and few successful business models in the literature to make this capability a high priority when considering other major projects.

Fourth, there is confusion about the available functionality of these systems in the minds of many buyers. The e-prescribing systems marketplace is still evolving, and many suppliers in this market segment are striving to make their software systems appear to be the best. This has created confusion among clinician buyers, who may not have the full opportunity or the time to assess all available options. A variety of wrong decisions have been made, resulting in less than optimal integration and usage.

Fifth, the cost of purchasing and implementing e-prescribing has become a major barrier for many clinicians in private practice. Estimates for the hardware and software costs of low-level e-prescribing systems range from \$1,500 to almost \$5,000 per clinician. Estimated costs for higher-level systems with advanced capabilities, including complex alerts and reminders, are almost \$30,000 per clinician in the 1st year and can be as high as \$5,000 to \$10,000 annually.

Sixth, in today's healthcare environment, most clinicians have had negative experiences with other information technology projects and have become

overly concerned about another experimental technology being used.

Finally, many clinicians question their investment into e-prescribing products that do not integrate with existing systems and expect that better products will be introduced into the marketplace in the near future.

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See also Adverse Drug Events; Clinical Decision Support; Health Insurance; Medical Errors; Medicare Part D Prescription Drug Benefit; Patient Safety; Pharmacy; Quality of Healthcare

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 eHealth Initiative: <http://www.ehealthinitiative.org>
 National Committee on Vital and Health Statistics (NCVHS): <http://ncvhs.hhs.gov>
 National Council for Prescription Drug Programs (NCPDP): <http://www.ncpdp.org>

EQUITY, EFFICIENCY, AND EFFECTIVENESS IN HEALTHCARE

Healthcare providers are increasingly under pressure to prove that their services are being delivered in an efficient and effective manner. Those

funding healthcare services—both third-party payers and consumers—are demanding more accountability. And policymakers are seeking measures that are objective and based on empirical evidence.

The reason for this pressure for greater accountability is that policymakers recognize that healthcare providers have an obligation to demonstrate that what they are doing is having some specific effect. In other words, it is possible to document outcomes from particular service delivery models or programs.

With rising healthcare costs squeezing profits and the growing numbers of people without health insurance pushing costs even higher, many employers are beginning to highlight healthcare costs and benefits as one of the most important issues to be addressed. At the same time, employees faced with increased cost sharing, the increased cost of health insurance, and the growing numbers of people without any kind of insurance are also pointing to healthcare as a “crisis.”

Healthcare policymakers are concerned with whether it is possible to develop measures to document improvement or change for particular medical conditions. They raise a number of questions. For example, what should be the standard for assessing whether a consumer/patient has gotten better or worse as a result of a given treatment or service delivery model? What specific outcome or set of outcomes is a treatment aimed at? It should be noted that the state of the art in terms of measuring medical outcomes is not such that one can be particularly precise about the results that have been achieved. How does one, for example, compare four units of wellness with two or three units? Can an outcome such as wellness really be measured at interval levels where one assumes that each additional unit of wellness has the same value as another unit?

More specifically, healthcare policymakers at the national, state, and local levels have demonstrated an increasing concern for equity, efficiency, and effectiveness of healthcare.

Definitions

Equity

One of the standards used to assess the delivery of healthcare services for purposes of accountability

is the extent to which these services, especially publicly funded services, are provided to the same people, to similar groups of people, or to constituencies. “Sameness” is at the heart of a standard that focuses, for example, on whether individuals or groups receiving healthcare services funded by the same health insurance plan (e.g., Medicaid) receive the same quantity and quality of services. To the extent that they are, then equity has been achieved. To the extent that they are not, then there are documented disparities, and equity has not been achieved.

Efficiency

Another standard that can be used to assess the delivery of healthcare services is the extent to which particular services have been delivered at the least possible cost to the public or to a different third-party payer. When the least possible cost has been identified, it is assumed that this represents efficiency. The standard of efficiency is most relevant when the policymaker’s goal is to compare alternatives for the investment of resources and to select the alternative that is the least costly. This standard is focused on the least costly method to achieve a particular objective.

Effectiveness

In contrast to efficiency, another standard focuses on particular goals or outputs that are to be achieved. Alternative programs or methods are compared that achieve the same output or outcome. In other words, this form of accountability involves specifying an objective or a level of desired output and identifying alternative methods that succeed in reaching the desired goal.

By identifying all alternative methods that succeed in reaching a desired level of output or outcome, policymakers may also be identifying a range of costs that are associated with this level of success. Consequently, an effective outcome may or may not be an efficient outcome. By employing effectiveness as a standard, policymakers may also be identifying inefficient options.

This discussion of different standards highlights the fact that if policymakers are looking to make health services programs more accountable, it is crucial to be clear as to what question is being

asked. If a policymaker is mainly interested in measuring quality or a particular outcome or a set of outputs, then a range of alternatives for achieving success may be identified that, in turn, have a range of costs associated with these options. However, this assessment would not necessarily provide any information about which of these alternatives is the least costly. It is only when one poses the challenge of identifying the least possible cost that one is analyzing efficiency.

From a health policy perspective, without considered attention to the efficiency dimension, the results of an analysis may be counterproductive in that inefficient options are invested in as if they were the best available. It is also clear that an analysis of neither efficiency or effectiveness will necessarily identify options that produce equity.

Context

These measures or standards of accountability should be placed in the context of a changing health services delivery and policy landscape. By understanding how the service delivery systems and models have changed, it will be possible to also understand where the demands for accountability have come from.

In the early 1990s, the dominant model for health insurance financing and delivery in the United States was the fee-for-service system. Managed care was beginning to grow in importance but still had a smaller market share. In 1994, 50.5 million Americans were enrolled in health maintenance organizations (HMOs), and in 1993, preferred provider organizations (PPOs) had approximately 60 million enrollees. By 2006, more than 70 million Americans were enrolled in HMOs, and almost 90 million were part of PPOs.

An area where this shift to managed care has been particularly influential has been in Medicaid. In 1991, 2.7 million Medicaid recipients were enrolled in some form of managed care; by 2004, 27 million Medicaid recipients were enrolled in managed care. A total of 63% of all Medicaid recipients in the nation were enrolled in managed care in 2005.

The design of the American healthcare system is such that third-party payers for health coverage are a driving force in shaping the healthcare system

and in driving the development of accountability measures. As recently as 1960, consumers paid most healthcare expenditures as out-of-pocket expenses. In 1960, 55% of all healthcare costs were paid out of pocket, but by 1998, that number had dropped to less than 20%. It may not be coincidence that healthcare expenditures, measured as a percentage of the nation's gross domestic product (GDP), have risen in line with this increase in third-party payment. It is also worth noting that prior to 1965 and the passage of Medicare and Medicaid, the public healthcare delivery system was limited to state public health departments and some public hospitals and there was no broad insurance scheme for any segment of the population.

The system of third-party payment, especially in the form called fee-for-service insurance, contains very little incentive for cost control. Neither the provider nor the patient is at financial risk in making healthcare decisions. In economic terms, the marginal cost to either of these participants in the transaction was very low, usually zero. However, the marginal benefit of extra healthcare expenditures, while diminishing, was certainly positive. Since benefits exceeded private costs, it was "rational" for the physician to order more services and tests. However, it is unlikely that benefits exceeded the overall costs to society. Regardless, the result was ever-increasing expenditures on healthcare; and from the mid-1960s through the early 1980s, healthcare expenditures rose by more than 10% per year. Much of the changes in the healthcare arena in the recent past can be traced to changes in laws and regulations related to healthcare. While some of this legislation has helped constrain healthcare costs, some of it has also contributed to rising costs in a variety of ways.

In the 1990s, growth of managed care coincided with a sharp reduction in the growth of healthcare costs. National data from that period suggest that managed care organizations (MCOs) have been substantially more efficient than traditional indemnity plans in controlling costs. The sweeping changes in the American healthcare system in the past 15 years, such as the slowdown in the rising rate of healthcare costs, cutbacks at hospitals, and the merger of hospitals and drug companies, can be attributed in large part to the spread of managed care. While a great deal of the cost savings can be attributed to discounted prices negotiated

by MCOs, the literature also suggests that in these organizations there has been a significant decrease in the use of more costly tests, which has contributed to reduced total spending. There is certainly a general consensus that managed care was successful in reducing the rate of healthcare cost growth, and it remains a powerful tool for controlling the rate of increase. In other words, MCOs have reduced healthcare expenditures in three ways: (1) by reducing the quantity of services used, (2) by reducing payments to providers, and (3) by selecting healthier patients.

The controversy surrounding managed care stems from the question of what methods were used to achieve this level of cost control. The general answer is that managed care brought new constraints to the decision making of both consumers and healthcare providers. As indicated above, a system of fee-for-service compensation has built-in incentives for overutilization as services were provided beyond the point of effectiveness or even appropriateness. Managed care brought in a new set of incentives. The “managed” part of the term meant that there would be more attention paid to medical utilization reviewing procedures as well as to provider contracts. In this managed-care system, a greater emphasis on competition was injected into the healthcare marketplace. Insurers were able to successfully negotiate terms with hospitals and other providers that resulted in significant slowdown in the rapid rise of health insurance premiums. However, these new incentives created concerns about the quality of care being provided by providers who were suddenly forced to become more cost conscious.

This quality controversy was fueled throughout the 1990s by media horror stories and a number of lawsuits alleging that managed-care plans were guilty of medical malpractice. Despite the public perception that managed care might reduce quality, the available evidence suggests that there has been no clear change in the quality of care provided under managed care, even in areas that have been specifically targeted for regulation, such as maternity care. At worst, the evidence about the quality of care provided under managed care has been mixed, with analyses reviewing more than 100 primary studies finding nearly equal numbers of examples of managed-care arrangements that increased quality as those that decreased quality.

Despite the fact that managed-care plans did succeed in controlling costs without decreasing quality, there was a significant backlash from consumers and providers to this new form of healthcare service delivery. This strong public backlash has been driven by claims that managed care has not reduced costs or increased efficiency, it has led to patient dissatisfaction, and its management techniques have resulted in adverse medical outcomes.

This dissatisfaction came to a head in the late 1990s and early 2000s, when a series of so-called anti-managed-care regulations were passed at the federal and state levels and a series of lawsuits against HMOs put the question of managed-care organization liability on the top of the health policy agenda. Between 1996 and 2002 alone, nearly 900 bills introducing some form of regulation of MCOs were introduced in legislatures across the nation, and at least one provision was enacted in every state. By 2001, all but four states had some type of comprehensive patients’ bill of rights or patient protection act.

In sum, this picture of the healthcare service landscape documents that the demands for accountability are directly related to concerns over cost control, quality, and consumer dissatisfaction.

Measures

In the public sector, standards emerged out of the Medicare program and a desire by policymakers to effectively document and control costs while maintaining high-quality services. The first measures were developed in the inpatient sector. These measures became known as the Medicare payment systems.

The impact of the Medicare payment systems on the nation’s hospital sector has been substantial and widespread since it introduced its prospective payment system (PPS) in 1983. The PPS is divided into an inpatient system (IPPS), which is based on Diagnosis Related Groups (DRGs) payments, and an outpatient payment system (OPPS), which was implemented in 2000 and is based on ambulatory payment classifications (APCs) related to the episode of care. The PPS, which replaced the previous cost-based reimbursement system, is designed to create financial incentives for hospitals to become more efficient in providing services for each episode

of care provided to Medicare beneficiaries. Medicare administrators believed that such a system would create a more competitive, market-like environment in the hospital sector. The theory was that hospitals that successfully implemented improvements in efficiency under the PPS would become more competitive vis-à-vis their counterparts who were unable to achieve efficiency gains.

First adopted by Medicare in 1983, DRGs are now used by health systems internationally as a method to control costs. Under the DRG system, medical conditions are classified into approximately 500 groups. DRGs (and the similar APCs used in the outpatient setting) represent predetermined payments based on the average cost of providing a given healthcare service, including all the ancillary services necessary to perform the service. The payments are weighted based on the median cost of providing the service in a given geographic area. Services provided within a given DRG are expected to incur similar healthcare costs and use a similar amount of hospital resources and are therefore used to set standard Medicare reimbursement rates.

Proponents argue that DRG reimbursement systems have contained hospital costs, saving nearly \$18 billion in their 1st year of implementation. Critics say that low reimbursement rates provide an incentive for private physicians to reject Medicare patients and place an undue fiscal strain on hospitals. The costs are then passed on to other insured hospital patients, raising healthcare costs overall.

One of the goals of introducing the PPS was to encourage a shift of some hospital services to less expensive outpatient settings and thereby reduce the overall costs of inpatient hospital care. There are numerous examples of this goal having been borne out empirically, including the fact that the average hospital inpatient length of stay declined rapidly after the introduction of the PPS. Within the first few years of the PPS, the number of inpatient cataract surgeries declined by more than 65%, and the number of outpatient cataract surgeries increased by almost 130%.

The PPS also had a profound but indirect, and largely unintended, consequence. In many cases, private payers have modified the PPS for their own purposes or used outright the Medicare DRGs payment structures as reference pricing for their

own reimbursement policies. The result of this development is that Medicare reimbursement policy not only affects the prices of medical care for Medicare beneficiaries, but it also creates a standard for medical care pricing for the entire healthcare industry, both public and private.

The nature of the hospitals with which private insurance companies contract can affect the insurance companies' ability to compete with one another. For example, insurance plans' marketability to employers and employees depends not only on the price of the coverage they offer but also on the number of hospitals where coverage is offered and on the quality, accessibility, and desirability of those hospitals. Being a must-have hospital may confer a significant competitive advantage to such a hospital in contract negotiations with private insurance companies.

The Centers for Medicare and Medicaid Services (CMS), the federal agency that administers the Medicare program, clearly has a profound effect on the competitive environment in which hospitals operate, but this is primarily an indirect effect through its price-setting authority. It does not, for example, have the ability to use competitive bidding or selective contracting mechanisms to exert direct control of the providers with which it negotiates. And there is virtually no way for Medicare to encourage nonprice competition between providers. This is what recent pay-for-performance initiatives would attempt to do by inserting quality and outcome measures into the payment policy, but such initiatives are in their infancy.

Hospital pricing in the United States is determined by four primary factors: (1) the amount of bulk purchasing by insurance companies, (2) price discrimination between different buyers of services, (3) cost shifting between consumers, and (4) cross subsidies between types of services. Bulk purchasing typically involves large insurance companies negotiating discounted pricing for some or all services in exchange for a guaranteed volume. Price discrimination may result from different negotiations with different insurance companies and involves charging different prices for the same services to different payers. Cost shifting occurs when a hospital raises prices for one group of purchasers while lowering the price for another group. Cross subsidizing is similar to cost shifting in that one group is charged more for certain services; but

in this case, the excess revenue is used to subsidize the price of those services for another group.

There is controversy about whether hospitals increase prices to private payers in response to reductions in payment rates from public programs—whether they engage in cost shifting. Cost shifting has its roots in community-rated insurance, which depends on “overpayments” relative to underlying healthcare costs incurred by youthful and less sick populations. These payments cover “underpayments” relative to the healthcare costs incurred by older and sicker populations. This form of cost shifting was an outgrowth of hospitals’ and physicians’ charging practices before health insurance was generally available. Most discussion of cost shifting now centers on hospitals, where, to varying degrees, public payers and self-pay patients have paid less than their costs. The financial losses incurred by hospitals in providing care to these populations have generally been cross-subsidized by revenue surpluses generated by the privately insured.

The practice of direct hospital rate setting by states has undergone a significant reduction since the introduction of managed care. In the 1970s and 1980s, it represented an experiment that fascinated health policy analysts and enjoyed wide application in 30 states by 1980. However, currently it is only applied in Maryland and West Virginia. According to one source, the decline reflects the development of managed care and capitation as alternative means to control the growth in health spending. This trend represents both an evolution in prospective payment methodology and a renewed preference for private- over public-sector price controls.

Studies indicate that rate-setting systems were effective in controlling costs per hospital admission but ineffective in controlling healthcare costs overall. These systems did not control the number of hospital admissions, nor did they regulate outpatient costs. With the rise of managed care and its broader potential to contain healthcare costs, most states turned to market-based strategies and abandoned regulatory initiatives.

Prior to 1993, some healthcare providers (physicians) chose not to participate in the Medicare program in an effort to bypass Medicare’s mandated payment rates. But since 1993, the maximum amount that a nonparticipating provider can charge over Medicare’s approved charge rate has

been limited to 15% of the approved charge. As a result, many providers have been reducing the number of patients on Medicare that they will accept or are reducing the range of services that they will provide to Medicare enrollees. This pattern increases when Medicare’s budget is cut, and this reduces the access of Medicare beneficiaries to certain healthcare providers. The effect is to reduce the choice of providers for those in the program. Successive budget reductions have operated to reduce the number of providers who are willing to see Medicare patients without limitation.

Cost shifting and cross-subsidization tend to be minimized in a highly competitive market, and the U.S. Congress has recognized certain areas in which there is perceived social value in maintaining hospitals’ ability to continue to provide those services. It has been estimated that U.S. hospitals incur costs of \$25 billion to \$50 billion annually in providing community service, primarily in the form of health professions education and standby costs. In the case of hospitals with significant teaching functions and those whose patient base is substantially poorer than average, Medicare provides a direct subsidy to support those functions. These subsidies total more than \$10 billion in direct payments annually.

Both for-profit and not-for-profit hospitals receive support from Medicare for activities related to medical education. Large academic medical centers as well as many community-based hospitals receive Medicare payments proportional to the number of trainees (medical interns, residents, and fellows, and allied health professional trainees) who are working in their system. These payments help defray the costs of medical education that these hospitals bear, which often involves incurring greater than average uncompensated-care costs because teaching hospitals tend to be in low-income areas with higher than average populations of uninsured patients. Not including charity care, the cost of health professions education has been estimated to be \$20 billion to \$25 billion annually, and as noted above, Medicare pays a substantial portion of this subsidy to hospitals. This amount is calculated as part of Medicare payments to support graduate medical education and includes the indirect costs of operating the hospitals as well as the direct costs of salaries and benefits for trainees and attending physicians.

Some hospitals also receive additional funding from the Medicaid program to support the community benefit role they perform serving low-income populations. This Disproportionate Share Hospital (DSH) program helps defray the costs of providing uncompensated, or charity, care, which many hospitals in low-income areas provide, and it represents a significant additional government input into the hospital sector. In 2002, hospitals reported a total of \$22.3 billion in uncompensated-care expenses, and the DSH program payments amounted to \$15.2 billion.

Future Implications

Overall, accountability issues focus on the need to be able to measure outcomes (acceptable or not) and the ability to measure costs, appropriately defined. While cost measurement poses few theoretical barriers, the ability to measure outcomes and to determine what is an acceptable outcome poses serious problems. This is why it is critical to understand the healthcare policy landscapes well as some of the initiatives developed by the Medicare and Medicaid programs. Not only are outcome measures not well developed, they are also not uniformly adopted or applied. There is a definite need for further development of the concepts of equity, efficiency, and effectiveness along with measures that are employed using these concepts.

Robert F. Rich

See also Cost of Healthcare; Evidence-Based Medicine (EBM); Health Disparities; Health Insurance; Hospitals; Managed Care; Outcomes Movement; Public Policy

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- American Society of Health Economists (ASHE): <http://healthconomics.us>
- International Society for Equity in Health (ISEqH): <http://www.iseqh.org>
- World Health Organization (WHO): <http://www.who.int>

ETHICS

Ethics is a branch of philosophy that studies moral values and principles. It identifies right and wrong behaviors of individuals and members of a profession. While discussing ethics in healthcare, many distinctions have to be made. There is the growing field of bioethics, at the intersection of moral inquiry and progress in the life sciences. The original field of medical ethics has been all but swallowed by this newer cousin. Many commentators make a distinction between bioethics and the smaller, but no less important, field of public health ethics. There is a nascent literature on the social ethics of health, looking at the moral values that play a role in health and healthcare policy-making. Organizational or business ethics is a burgeoning field. There is also the growing list of professional organizations that have felt the need

to develop and promulgate codes of ethical conduct. Most university courses and publications in health ethics spend quite a bit of their efforts on standards for the ethical conduct of research. This entry identifies some of the major topics being examined within each of these fields and addresses some of the more pressing issues. It also assesses the differences and similarities between these fields of study.

Protection of Human Subjects

For practitioners of health services research, probably the most important ethical questions have to do with how to conduct their work without violating customary or legal standards of behavior. In evaluating health services outcomes, it would be useful to be able to randomly assign patients to treatment and control groups, but this cannot be done without due consideration given to the rights of the people involved. The study of best practices would benefit from being able to observe the natural history of diseases, but society does not allow this to be done without the informed consent of those being observed.

There are certain touchstones that need to be acknowledged if one is interested in understanding the history of protection of human subjects of research. Among these are the Tuskegee syphilis study and the Belmont Report. In the 1930s, a group of researchers from the U.S. Public Health Service (PHS) decided that they would closely observe a group of African American men diagnosed with syphilis to determine the natural history of the disease in Black men. The men were not offered treatment, even when, a few decades into the study, modern antibiotics became available.

Today, society looks aghast at this violation of the dignity of these men, treated as not much more than animals to be observed rather than patients to be served. Failing to discuss the goals of the study and secure the participants' permission was a violation of the men's autonomy, their right to determine their own future. The researchers did not treat these men, thereby failing to provide them the beneficence that is the hallmark of healthcare. Deciding to do without life-saving treatment when it became available was an obvious violation of the value of nonmaleficence. And it is impossible to

avoid the injustice of these actions, perpetrated on an underprivileged minority; justice demands that those who might bear the risks of an experiment be among those who could benefit from the results. These four principles—autonomy, beneficence, nonmaleficence, and justice—form the basis of most contemporary discussions about the need to protect human subjects involved in health-related experiments.

In 1974, the U.S. Department of Health, Education and Welfare formed the National Commission on the Protection of Human Subjects of Biomedical and Behavioral Research. The commission held a series of meetings at the Smithsonian Institution's Belmont Conference Center, and the report that was issued in 1979 was forever referred to as the Belmont Report. The report identified three principles that need to be considered when designing and carrying out research involving human subjects: respect for persons (encompassing autonomy), beneficence (including nonmaleficence), and justice.

The report also recommended practical guidelines for achieving informed consent, assessing the risks and benefits of the research, and selecting the subjects. Under informed consent, the report discussed the following: the amount and accessibility of information that was available to potential subjects, the subjects' ability to comprehend the information presented to them about the nature of the risks, and the extent to which the subjects voluntarily undertook the risks from the research.

The Belmont Report recommends that the nature of the risks to the human subjects should be fully understood and the magnitude and the distribution of the risks and benefits of the research should be commensurate. In trying to achieve the proper balance between protecting human subjects and encouraging needed research, the report states that research on human subjects must be "justifiable" and identified a number of factors that must be considered in assessing justifiability. It states that "brutal or inhumane treatment" of human subjects is never justifiable. Risks to participants should be kept as low as possible, and the more significant the risk of serious impairment, the more closely reviewing committees must scrutinize the research protocol. If participants are drawn from vulnerable populations, the committee should consider involving them at all. In any case, researchers

and review committees should balance the relative risks and benefits to study participants and make sure that information on them be adequately conveyed in the informed consent documents.

Finally, the report states that the principle of justice requires that there be “fair procedures and outcomes in the selection of research subjects.” The application of this principle, states the report, must occur not just at the level of the subjects themselves, making sure that selection procedures are equitable, but also at the societal level, where researchers should take into account the social justice implications of having too much of the burden fall on isolated sectors of the community—for instance, where vulnerable populations are targeted as research subjects due to their relative lack of power or status.

The U.S. Department of Health and Human Services (HHS) has issued federal regulations that establish the baseline requirements for programs to protect human subjects of research. These regulations are overseen by the Office for the Protection of Research Risks. This regulation empowers an institutional review board (IRB) to review all proposals to ensure that human subjects are granted the maximum protection possible. While certain types of research are exempt from these rules, it is common to use an IRB as the body that determines the exempt status of proposed research. Hence, health services researchers must, inevitably, become adept at understanding the federal and state rules that govern their work, as well as the policies and procedures set by their employers or cooperating institutions.

Bioethics

In addition to having ethical concerns in the conduct of their work, health services researchers may be called on to do work that educates the difficult decisions faced by health professionals, organizations, and policymakers at the intersection of moral inquiry and progress in the life sciences. Once referred to as medical ethics, this field is now more broadly known as bioethics.

The number of university-based programs in bioethics has risen exponentially in the past decade. In addition, there are many government commissions, journals, blogs, international conventions,

institutes, centers, university courses, and books on the subject.

A place to begin understanding the breadth of this field is the Web site of the Kennedy Institute for Ethics at Georgetown University, Washington, D.C., aptly subtitled “Where Bioethics Research Begins.” The institute offers “quick bibliographies” on topics of bioethics concerns. The list for the 100 most recent bibliographic citations in the institute’s database gives a useful overview of the enormously wide range of topics that bioethicists address. There are ethical issues involving the practice of healthcare, such as advanced directives, patient relationships, and terminal care. There are social problems, such as abortion (subdivided into legal aspects, moral and religious aspects, and social aspects), chemical and biological warfare, and cloning. The fact that bioethics is an extraordinarily inclusive rubric is evidenced by items on this list such as codes of ethics, informed consent (both for treatment and for research), and resource allocation.

Public Health Ethics

Public health ethics is a relatively new concern. Much of the discussion in the field is focused on the research ethics questions discussed above, some of it involving health services research, some of it involving epidemiological research and randomized controlled trials. A point of view has been expressed attempting to separate public health ethics from bioethics, on the basis that public health ethics is more properly concerned with the use of societal power and its potentially coercive impact. The most commonly cited books in the field usually reflect the academic preparation of their authors, such as law or philosophy.

Another emphasis is on developing codes of ethics for administrators of local health departments. Some of the people in this field also argue that a full view of public health ethics has to include a discussion of how normative or social ethics educates public health decision making.

Normative or Social Ethics

Normative ethics is the study of what is right and what is wrong. Social ethics is less clearly defined

but usually refers to a discussion of how communities or bodies politic can achieve the “good.” The trajectories of social ethics and health services research might be seen as skewed lines, since social ethics wishes to answer just the sort of normative questions that scientifically oriented health services researchers eschew. However, most of all the problems that concern social ethicists, issues such as rights and justice and fairness, are inextricably linked with the public policy issues that health services research hopes to illuminate with its objective work. And facts, reliable conclusions, careful analyses, are all critical inputs into normative decision making.

Social ethics attempts to understand the nature of human rights and what those ideas say about the distribution of healthcare in the United States or around the world. Is healthcare a birthright that attaches to every child born? If so, then researching market-oriented health systems may be greatly missing the point. But even if healthcare is a birthright, society can never guarantee an unlimited amount of it to everyone, everywhere, and at all times. Society’s decisions on what is “best” to do, what priorities to set, and how quickly to effect change, must all be informed by sound research.

Codes of Ethics

Many of the professions, such as law, medicine, and dentistry, have early on in their development recognized the benefits of having a code of ethics. For example, the American Medical Association (AMA) has a recommended code of ethics for physicians dating back more than 150 years. This approach is becoming popular in other venues. The American Nurses Association (ANA) has a much more recent code. The American Public Health Association (APHA) also recently adopted a code of ethics. And the American College of Healthcare Executives (ACHE) has a code of personal and organizational ethics for its members.

The ACHE code identifies the ethical responsibilities that healthcare administrators owe to patients served, to the administrator’s coworkers and employees, to their organization, to their profession, and to the larger community and society that they ultimately serve. It includes a section discussing under what circumstances a healthcare

administrator has a duty to report known violations of the code. As with many of these organizational efforts, the ACHE also includes a frequently updated list of policy documents addressing specific ethical problems faced by administrators. It is not clear how successful these codes are in consistently producing ethical behavior, a potentially interesting area for health services researchers to investigate.

AcademyHealth, the professional society for health services researchers, does not appear to have a complete code of ethics. In 2004, the organization issued a thorough report titled *Ethical Guidelines for Managing Conflicts of Interest in Health Services Research*. The organization’s Ethical Guidelines Committee focused on three values that guided their development of the policy: (1) maintaining the integrity of health services research, (2) providing consistency between the ethical values of health services research and those of other health-related research, and (3) ensuring that practitioners are aware of and adhere to the ethical guidelines of the multiple disciplines that are involved in health services research. This statement recognizes that health services researchers are doing inherently interdisciplinary work and will bring with them the ethical practices of the disciplines in which they were trained. This presents a problem for newer educational programs focusing specifically on health services research, as their ethics education will need to be drawn from a variety of other sources. Certainly, such programs will need extensive coverage of the “whys” and “why nots” and the “dos” and “don’ts” of research ethics, but they may also need to identify the ways in which the ethical issues raised by health services research differ from the ethics of other types of health-related inquiry.

The AcademyHealth document does contain 14 guidelines for the ethical conduct of health services research, albeit with a focus on how they relate to preventing conflicts of interest. These guidelines emphasize that ethical concerns can arise in every phase of the researcher’s work, in initiating the research, in conducting the research, and in reporting on the research.

So not only does the health services researcher need to understand the mandated protections of human subjects, but he or she must also confront the fact that the outcome of his or her work may very

well cost a lot of people a lot of money. Any time large and powerful organizations can be affected, positively or negatively, by a researcher's work, the researcher must be vigilant against the influence that those large and powerful organizations have on the research agenda or the conduct of its efforts. To do otherwise could be considered disingenuous.

Lessons

Health ethics is a very broad topic. At best, this entry has offered a list of key words to use when exploring less limited venues and then put those key words into some perspective.

If a health services researcher were just starting to look at the ethical issues involved in his or her work, he or she would do well to start with a thorough investigation of the ethics of doing research. If there was any part of the field of ethics that every health services researcher must know about, it is the ethical concerns of doing work: involving human subjects and where powerful interests stand to gain or lose lots of money as a result of the work's conclusions. IRBs and conflict of interest reviews should be the starting point. And the interdisciplinary nature of health services research creates an added responsibility for the researcher to understand multiple perspectives.

Health services researchers should understand the larger arena in which they are operating, and they should become more familiar with the spreading field of bioethics. One way to look at the relationship between bioethics and health services research is that the latter is merely one category of the former. If that is so, then health services researchers are an integral part of the bioethics field and need to understand the terrain of their work. However, many health services researchers do not see themselves fitting neatly into bioethics, but the two worlds are multiple and complexly linked. Bioethics is, at least, the context of health services research and so ought to be studied by any health services researcher who has an expansive view of his or her research agenda.

Discussions about health are not easy to separate from discussions about moral decision making. The word *health* has as its Indo-European origin the same root as *holy*. It is not possible to discuss health ethics without addressing "right and

wrong." While this may not be an area of inquiry in which the health services researcher is trained, he or she would do well to understand the nature of this ongoing social dialogue, the role that health services research might play in informing that dialogue, and the role that this dialogue plays in shaping the future of health services research.

Daniel Swartzman

See also Health Insurance Portability and Accountability Act of 1996 (HIPAA); Informed Consent; Public Policy; Randomized Controlled Trials (RCTs); Rationing Healthcare; Regulation; U.S. Food and Drug Administration (FDA); Vulnerable Populations

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- Kennedy Institute for Ethics: <http://kennedyinstitute.georgetown.edu>

ETHNIC AND RACIAL BARRIERS TO HEALTHCARE

Ethnic and racial minorities, including African Americans, Hispanics/Latinos, Native Americans and Alaskan Natives, Asian and Pacific Islanders, and Native Hawaiians, comprise approximately 25% of the United States population. It has been well documented in research studies that ethnic and racial minorities face barriers to the healthcare system due to a variety of factors, including socioeconomic, healthcare coverage, geographic, cultural differences, and decreased access and availability to healthcare providers. The ethnic and racial barriers to healthcare have in turn resulted in health disparities or differences in health outcomes and health status across racial and ethnic subgroups.

Overview

The historical injustices that ethnic and racial minorities have endured in the United States are significantly intertwined with the issue of racial and ethnic barriers to healthcare. For example, Native Americans were left to care and fend for themselves after smallpox and yellow fever were brought over by the early European settlers. Additionally, this group has been historically marginalized. Within the African American community, there remains great mistrust of the healthcare system due to the Tuskegee studies, where African American males participated in research studies without any informed consent and were denied proper treatment for syphilis with penicillin. The history of segregation of African Americans still runs deep in this community, and it has created social barriers. There are similar injustices that Hispanics/Latinos, Asian and Pacific Islanders, and Native Hawaiians have endured that provide some context and background to the racial and ethnic barriers to healthcare.

There is a large body of literature documenting the inequities and disparities in the treatment that patients receive based on their race or ethnicity. A 2003 national Institute of Medicine (IOM) report *Unequal Treatment: Confronting Racial and Ethnic Disparities in Health Care* acknowledges

that minority groups generally receive lower quality of care than nonminorities, even after considering access to care, insurance status, and income. The report also noted that the causes of these disparities are widespread and complex, requiring systemic changes at many levels by various actors.

Potential Barriers to Healthcare

In addition to the biases present in the nation's healthcare system, ethnic and racial minorities may face hardships in terms of finances, transportation, and child care to get to regular healthcare visits as well as encounter possible difficulties in navigating the complicated healthcare system. Generally speaking, ethnic and racial minorities are of lower socioeconomic status and have lower education levels, which are correlated with poorer health outcomes. Furthermore, many ethnic and racial minority groups may be at greater risk of being exposed to certain environmental conditions that may adversely affect their health. Ethnic and racial minorities may also have greater geographic impediments by traveling farther distances to see a healthcare provider. As a result, ethnic and racial minorities often encounter greater barriers when accessing the healthcare system.

A 2001 study by the National Center for Health Statistics (NCHS) indicated that 27% of Hispanics did not visit a healthcare provider over a period of 1 year. Additionally, 21.4% of Native Americans and Alaskan Natives, 20.8% of Asians, and 16.4% of Blacks did not receive any healthcare over the same time period compared with 14.3% of Whites.

Additionally, the lack of health insurance coverage poses a significant barrier to many ethnic and racial minorities in receiving appropriate healthcare. Although nearly 74% of Whites are privately insured, only about 45% of Hispanics/Latinos are privately insured. Furthermore, Medicaid covers approximately 20% of African Americans, while only about 10% of Whites are covered through this publicly sponsored program. Compared with the 12% of Whites who are uninsured, about 33% of Hispanics/Latinos, 33% of Native American and Alaskan Natives, 20% of African Americans, and 17% of Asian Americans were uninsured. The reason for the disparities in terms of healthcare coverage between these groups is primarily due to

employment status, where ethnic and racial minorities are unemployed, employed in a job that does not offer health insurance, or are unable to afford the health insurance coverage offered.

There may also be differences in cultural beliefs that preclude certain ethnic and racial groups from seeking healthcare in addition to the historical mistrust of the healthcare system, resulting in minority groups having less satisfaction with their medical care. Furthermore, certain ethnic and racial groups may not believe in Western medicinal practices. There may also be linguistic barriers to receiving culturally appropriate healthcare.

Due to this recognition, the concept of cultural competence, training health professionals to deliver culturally competent healthcare, has become a popular notion as an effective means of reducing some of the barriers faced by ethnic and racial minorities. Cultural competency training has been used to make providers aware of disparities in health status and to improve provider-patient relationships by delivering tailored and appropriate care.

Future Implications

It is estimated that by the year 2050, ethnic and racial minorities will outnumber the current White majority. As the ethnic and racial minority population continues to grow, it is paramount that barriers to healthcare be properly identified and addressed. Proactive efforts should be made to eliminate ethnic and racial barriers to healthcare in addition to eliminating health disparities. Cultural competency programs are a step in the right direction of making this a tangible reality.

Richard H. Sewell

See also Access to Healthcare; Child Care; Cultural Competency; Economic Barriers to Healthcare; Health Disparities; Medicaid; Transportation; Vulnerable Populations

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 Commonwealth Fund: <http://www.commonwealthfund.org>
 Robert Wood Johnson Foundation (RWJF):
<http://www.rwjf.org>

EVANS, ROBERT G.

Robert G. Evans is a leading Canadian health economist. His comparative studies of healthcare systems and funding strategies have greatly influenced the Canadian federal and provincial governments. He also has served as a consultant to many governments and public agencies in the United States, Europe, Asia, and the South Pacific.

Evans is a senior faculty member and professor of economics at the University of British Columbia in Vancouver, Canada. Evans is a fellow at the Canadian Institute for Advanced Research. He was previously the director of the Institute's Population Health Program from 1987 to 1997.

Born in 1942, Evans earned a bachelor's degree in political economy from the University of Toronto and a doctorate degree in economics from Harvard University. While in graduate school, Evans was a research staff member of the Ontario Committee on Taxation (the summers of 1964 and 1965) and

at the Bank of Canada (the summers of 1966 and 1967). He returned to the Ontario Committee on Taxation in 1967 and the Bank of Canada in 1968 on a part-time basis. He also worked part-time at the Ontario Hospital Services Commission in 1969. After graduating from Harvard, Evans became an assistant professor at the University of British Columbia. He quickly rose through the academic ranks of the university, becoming associate professor in 1973 and professor in 1978.

Throughout his career, Evans has served on the boards of numerous healthcare, research, and policy organizations. He was the president of the Canadian Health Economics Research Association; member of the National Health Research and Development Program, Main Advisory Committee; member of the expert advisory panel on National Health Expenditures, Canadian Institute of Health Information; member of the Commonwealth Fund Commission on Elderly People Living Alone; member of the executive board of directors of the International Health Economics Association (iHEA); and board member of the Association for Health Services Research (now AcademyHealth).

Evans has authored or coauthored more than 230 scholarly articles and books. Two of his books are considered classics: *Strained Mercy: The Economics of Canadian Health Care* and *Why Are Some People Healthy and Others Not? The Determinants of Health of Populations*. He is a frequent commentator in the journal *Healthcare Policy*. And he serves on the editorial boards of *Annals of Internal Medicine*, *International Journal of Technology Assessment*, *ISUMA Canadian Journal of Policy Research*, *Journal of Health Economics*, and *Journal of Health Politics, Policy and Law*.

Evans has received many awards and honors in recognition of his work. He is an honorary life member of the Canadian College of Health Services Executives and the Canadian Health Economics Research Association, and he is a member of the National Academy of Social Insurance in the United States. He also was a member of the British Columbia Royal Commission on Health Care and Costs in 1990, and the National Forum on Health from 1994 to 1997. He was awarded the Baxter International Health Services Research Prize in 2001 by the Association of University Programs in Health Administration (AUPHA). In 2002, he also

received the Health Services Research Advancement Award from the Canadian Health Services Research Foundation (CHSRF).

Amie Lulinski Norris

See also Canadian Association for Health Services and Policy Research (CAHSPR); Canadian Health Services Research Foundation (CHSRF); Canadian Institute of Health Services and Policy Research (IHSPR); Health Economics; Health Services Research in Canada; International Health Systems; Public Policy

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- University of British Columbia, Centre for Health Services and Policy Research (CHSPR): <http://www.chspr.ubc.ca>

EVIDENCE-BASED MEDICINE (EBM)

Evidence-based medicine (EBM) is a fairly recent concept in the field of medicine, and it represents a major paradigm shift from the reliance exclusively on clinical expertise in healthcare decision making. EBM involves the integration of the best available research evidence with clinical

experience and patient preferences. By combining these three components, the goal of EBM is to provide the best possible healthcare and obtain the best patient outcomes possible.

EBM involves five steps: (1) generating an answerable clinical question; (2) conducting a search to find the best research studies available that can answer the question; (3) critically evaluating the studies found for validity (closeness to the truth), impact (size of the effect), and applicability to clinical practice; (4) integrating the research evidence with the clinician's expertise and experience and the patient's values; and (5) evaluating the efficiency and effectiveness of conducting Steps 1 to 4 for potential improvements the next time they are implemented. Each of these steps is discussed in more detail below.

While it is believed that by applying findings from research studies as evidence to the application of clinical practices will result in improved decision making and patient outcomes, EBM has received mixed reactions by clinicians and academics. In real-world clinical practice, it is very difficult for clinicians to keep up-to-date with the rapid expansion of healthcare information being published. When faced with clinical questions concerning a diagnosis, prognosis, treatment, or general care, the answer is typically needed rapidly. With the volume of published information, most clinicians will only have time to read a small portion of what is available on a regular basis. The hope of EBM is that in the case of some of the more pertinent clinical questions, the evidence may have already been found, critically analyzed, and packaged in a format that is readily accessible to the busy clinician. Ultimately, the goal is to have patients, clinicians, healthcare managers, and policymakers have available to them healthcare research that is scientifically valid and readily applicable to clinical situations.

History

There are accounts of evidence being used to change medical practices as far back as the 1700s. In more recent times, Sir Richard Doll (1912–2005), a world famous English epidemiologist, described evidence for medical practice in 1937 with the use of case studies as guides. The use of evidence became more scientifically controlled with the

first published randomized controlled trial (RCT) reported in 1948 by the Medical Research Council in London. Archibald L. Cochrane (1909–1988), whose work would lead to the Cochrane Collaboration, published what is considered a classic work titled *Effectiveness and Efficiency: Random Reflections on Health Services* in 1972. This text had a profound effect on medical practice and evaluation with its stress on the importance of RCTs in evaluating the effectiveness of treatments. The Cochrane Collaboration, which was named in his honor, is known worldwide for its development, evaluation, and synthesis of RCTs in all areas of medicine.

The momentum for what was to become EBM began in the 1970s. Research was increasingly showing a wide variety of practice patterns among physicians, challenging the assumption that clinical judgment or the art of medicine was sufficient. It was deemed that medical decisions were far too complex for a physician to have all the information needed to make decisions in this manner. It was also found that there was a gap between clinical research and what was occurring in clinical practice. The evidence was lacking for many important practices. As practices were studied through clinical trials, it was found that many of those being used by physicians were ineffective. Greater emphasis began to be placed on RCTs. However, it still took years for physicians to put the results of the trials into practice. In addition, with the rising cost of healthcare, a solution needed to be found.

The term *evidence-based medicine* first appeared in the 1990s. David L. Sackett, is widely regarded as one of the originators of EBM. Sackett developed the concept when he was a faculty member at McMaster University in Canada. After working at McMaster for decades, Oxford University in the United Kingdom created a chair for Sackett allowing him to establish the first center in EBM.

The original definition of EBM stressed the need for a systematic approach to analyze published research to be used for clinical decision making. Sackett later refined the definition in 1996 to stress a more evaluative and conscientious use of current research in caring for individual patients. In 1997, the Agency for Healthcare Research and Quality (AHRQ) created the Evidence-Based Practice Center program, which collects and synthesizes evidence.

Steps

The practice of EBM constitutes a five-step process: (1) formulating a question, (2) finding the evidence, (3) critically appraising the evidence, (4) integrating evidence with clinician judgment and patient values, (5) and conducting a self-evaluation of the process. A description of each of these steps is given below.

Step 1: Formulating a Question

A good question must be answerable. Sackett makes a distinction between what he calls background and foreground questions. When a clinician's experience with a condition or disorder is limited, most questions will tend to be background questions. As clinical experience and responsibility grow, questions increasingly become foreground questions but still with the need for background knowledge. Background questions involve asking for general knowledge about a disorder by using a question root (who, what, when, where, how, why) with a verb and a disorder or an aspect of it. Foreground questions ask for specific knowledge about a given disorder and contain four essential components: patient and/or problem, intervention, comparison intervention (as needed), and clinical outcomes. In contrast, foreground questions often arise as central issues in clinical work, involving clinical findings, etiology, clinical manifestations of the disease, differential diagnosis, diagnostic tests, prognosis, therapy, prevention, patient experience and meaning, and self-improvement.

Step 2: Finding the Evidence

To make informed decisions or influence change, formulating an answerable question and then starting the process of information seeking is essential. Given the multitude of scientific and medical research articles that are now published annually, it is helpful to take a systematic approach to finding the best available evidence for the type of question being asked. Some researchers suggest looking at five areas as a guide: type of question, type of information that would answer the question, type of study that would provide the information, types of information resources that would give access to the best studies, and extracting the

best information from the resources. The types of questions might be categorized as clinical findings, differential diagnosis, diagnostic tests, therapy, prevention, prognosis, cause/etiology, cost-effectiveness, harm/risk, or quality of life.

The type of information that would answer the question will depend on the type of question. While RCTs have been considered the gold standard of scientific evidence in healthcare, a range of research methodologies, including quasi-experimental and qualitative research methods, which have been borrowed from the social sciences, may be considered appropriate evidence depending on the type of question. Questions involving patient satisfaction or quality of life would involve qualitative evidence, whereas the best evidence about a therapy might tend to be more systematically gathered and involve quantitative evidence. Hierarchies or levels of evidence are often constructed in a pyramid, showing the strongest to the weakest form of evidence for a particular type of question. In the medical model, the type of study that would be considered the strongest form of evidence is the one based on RCTs. Alternatively, a systematic review or meta-analysis, synthesizing the results of a number of RCTs, would be even stronger evidence. The quickest and potentially the most efficient way to find the best evidence is to use an evidence-based clinical practice guideline. However, there may not be one available that matches a specific clinical issue, and these guidelines, which are often developed by panels of experts, may contain more bias than a systemically controlled study. Where the strongest forms of evidence are not available, one would move down the hierarchy to less robust forms of evidence, such as nonrandomized clinical trials, cohort studies, prospective studies, and so on. Under some circumstances, the best form of evidence available may be case reports, which do not have the rigor and strength of evidence of a controlled research study but nevertheless may provide helpful information. Studies and other forms of evidence may be found in various databases (i.e., MEDLINE, CINAHL, and PsycInfo), catalogs, or free resources on the Internet in the form of journal articles, trial and research registries, bulletins and newsletters, published reports, gray literature, conference proceedings, and Web sites. It is critical that the literature be carefully evaluated for its strength and applicability to the question at hand.

Step 3: Critically Appraising Studies Found

On finding a journal article that includes potentially useful evidence, the next step is to evaluate its quality. Three key issues to address include validity, results, and the relevance of results.

In health services research, most studies include six major components by which a study can be analyzed—sampling, assignment to groups, assessment, analysis, interpretation, and extrapolation to large groups, as outlined by the National Information Center on Health Services Research and Health Care Technology (NICHSR). Each of the six components is discussed below.

Sampling

Health services research questions require data from large groups of people as recommendations for things such as reimbursement rates, screening, or surgical options that apply to the larger population. A sample of the population is studied and applied to the larger group. Based on statistical methods, an appropriate sample size of people to study can be obtained, from which the results can be applied to the larger group. Descriptions of the specific type of sampling used in the study should appear in the methods section of a journal article.

Assignment

People in the sample are assigned into prespecified groups, such as smokers and nonsmokers, to observe differences based on health behaviors and other characteristics. Alternatively, people may be randomly assigned to different groups to investigate the effects of different treatments on different groups. Regardless of study design type, the people in the experimental group must be alike except for the factor being studied so that the results may be attributed to the factor and not to differences in the people. Tables in a study showing the profiles of the people in each group should be reviewed for similarity in factors such as age, gender, ethnicity and race, socioeconomic status, and health status.

Assessment

The means by which people or factors are measured is of considerable importance to the value of the study. Some potential errors in measurement include inaccurate instruments, people

dropping out of the study without follow-up, people changing their behavior because they are being observed, or investigators treating groups differently.

When analyzing studies, it is important to look at the strength of the association between variables. Estimates of strength can be reported as relative risk, which compares the potential for one group having the same outcome as another group with the presence or absence of an experience or exposure to a condition or treatment. A relative risk of 5.0 is considered very significant. However, risks in epidemiological studies tend to be lower (i.e., 2.0). This has caused some concern and controversy about the value of the relative risk statistic. Statistical significance relates to characteristics of the larger population. From studying the results from a sample of the population, one can infer what is happening with the population.

The p value is used to measure statistical significance, with a value less than .05 indicating a less than 5% chance of the results occurring if there is no relationship to the larger population. A value of .01 has the same meaning at 1% probability. Either of these values generally results in the conclusion that there is a relationship to the larger population, which, however, is not the same as cause and effect. Finally, looking at adjustment is important. When differences between two groups being studied may influence the results, these factors are called *confounders*. Confounders may be analyzed using the statistical tools of stratification and regression analysis. Factors other than those targeted for study may have influenced and therefore confounded the results of the study. These factors are often noted in the discussion of a journal article. To understand the analysis, it is necessary to have some training in the area through readings, coursework, or consultation with a statistician.

Interpretation

A study is concluded by interpreting the results from the analysis to draw conclusions about individuals in the study. An assessment is made of the strength of the association between the variables being measured and the cause-effect relationship between them. Factors that may support more confidence in assuming a cause-effect relationship

are if the risk factor occurs more often in people with the specified outcome, if it precedes the effect, or if changes in the risk factor produce the effect. Causation may also be determined by looking at the strength of association between factors as measured by relative risk, determining the consistency of the association when the study of different groups in different settings results in similar outcomes, determining that a specific factor caused an outcome due to biologic plausibility in a clinical study, and a dose-response relationship in which higher levels of a risk factor contribute more than lower levels to an outcome.

Extrapolation

Before adopting a study as evidence for a clinical or administrative need at hand, one must determine if the study is applicable to the situation in question. For example, is the population under study similar according to characteristics that were controlled for in the selection of people? Can one generalize the results to another group, form of treatment, higher or lower dose of medication, and so on?

Step 4: Integrating Research Evidence With Clinician Expertise and Patient Values

Once the found evidence has been critically appraised, in clinical practice it is important along with the best available evidence to take the client's values and preferences into account as well as the professional judgment and experience of the clinician before making a healthcare decision. Clearly, the process and outcome of this step occurs on a case-by-case basis.

Step 5: Self-Evaluation

The final step involves evaluating oneself to determine how well the process was carried out in Steps 1 to 4. Where problems have occurred, one or more steps of the process may need to be repeated to find the best available evidence. There may also be a need for the individual to engage in further education about any of the steps involved in order to ensure greater success when seeking evidence the next time.

Selected Resources for Locating Evidence

There are numerous resources available on the Internet for learning about or finding evidence to be used in clinical or policy situations. Many are based in Canada, the United Kingdom, and the United States. Some of the main resources are highlighted below.

Evidence-Based Practice Reports

The AHRQ awards 5-year contracts to organizations in the United States and Canada to be Evidence-Based Practice Centers (EPCs). These centers thoroughly review the relevant scientific and medical literature in areas of clinical, behavioral, organization of, and financing of healthcare to produce evidence reports and technology assessments. In addition, they conduct research on the methodology of systematic reviews.

National Guideline Clearinghouse

This comprehensive database is a project of the AHRQ in partnership with the American Medical Association (AMA) and America's Health Insurance Plans (AHIP). It provides structured abstracts and links to full-text guidelines, where available, or for ordering information for print copies.

Cochrane Collaboration Database of Systematic Reviews

A major product of the Cochrane Collaboration, this database provides access to quarterly produced systematic reviews. The Cochrane Collaboration is a nonprofit organization that produces and disseminates systematic reviews related to healthcare worldwide and promotes the search for evidence in the form of RCTs. Access to the Cochrane Library is available by subscription online, on CD-ROM, or by PDA, and is free in various parts of the world through sponsorships by various organizations.

Health Services Technology Assessment Text

The Health Services Technology Assessment Text (HSTAT) is a free resource on the Internet

that provides links to full-text evidence documents to support healthcare decision making. It is available through the U.S. National Library of Medicine (NLM).

PubMed/MEDLINE

The database MEDLINE is freely accessible worldwide on the Internet using the PubMed interface maintained by the NLM. Evidence can be found by using the EBM limit. More options and instructions for finding specific forms of evidence are available from the Search for the Evidence Web site, a joint project between the New York Academy of Medicine (NYAM) and the New York Chapter of the American College of Physicians (ACP).

Barbara Nail-Chiwetalu

See also Agency for Healthcare Research and Quality (AHRQ); Clinical Decision Support; Clinical Practice Guidelines; Cochrane, Archibald L.; Meta-Analysis; National Guideline Clearinghouse (NGC); Randomized Controlled Trials (RCTs); Sackett, David L.

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Web Sites

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- Centre for Evidence-Based Medicine (CEBM):
<http://www.cebm.net>
- Cochrane Collaboration: <http://www.cochrane.org>
- Evidence-Based Medicine Resource Center:
<http://www.ebmny.org>
- National Guideline Clearinghouse:
<http://www.guideline.gov>
- PubMed Home: <http://www.ncbi.nlm.nih.gov/pubmed>

EYE CARE SERVICES

Studying the organization and delivery of eye care services is important to the field of health services research. Vision disorders and eye diseases affect the quality of life for tens of millions of Americans, and the resulting visual impairment or blindness significantly increases the economic burden to society. Undiagnosed and untreated visual disorders and eye diseases particularly affect children and the elderly. Childhood visual disorders have the potential to impede learning, and adult age-related eye diseases constitute a large percentage of preventable blindness in the United States. Analysis by health service researchers of eye care services can lead to increasing the nation's visual and ocular health.

Organization of Care

Three types of medical practitioners provide eye care services in the nation: ophthalmologists, optometrists, and opticians. Ophthalmologists are physicians who specialize in the medical and surgical management of the eyes and the visual system. They provide a spectrum of care, including the examination of the visual system to prescribe eyeglasses and contact lenses, as well as the diagnosis and medical or surgical management of eye disorders and diseases. In addition, many ophthalmologists further specialize in a particular section of the eye or disease. Ophthalmologists are medical doctors (MD) or doctors of osteopathy (DO).

Optometrists, also called doctors of optometry (OD), diagnose and treat vision problems,

prescribe eyeglasses and contact lenses, diagnose and treat eye diseases, and prescribe medications to treat eye disorders. They do not perform surgery, but they often provide patients with pre- and postsurgical care. Sometimes ophthalmologists and optometrists work in the same practice and co-manage patients.

An optician manufactures and fits eyeglasses and, in some states, contact lenses. Many states require opticians to be licensed to deliver these services. Some opticians manufacture eyeglass lenses and contact lenses from raw materials in the laboratory. Office-based opticians cut the laboratory-created lenses to fit into the eyeglass frame. Opticians then take eye measurements to ensure proper lens placement in the eyeglass frame and verify accuracy.

Since there is some overlap in the scope of care offered by ophthalmologists and optometrists, there is no defined organization of eye care delivery. An efficient and effective model is a vertically integrated system with optometrists being the primary entry point into the system with referral to ophthalmologists for more advanced medical care or surgical treatment. This design is widely recognized in studies as showing an enhancement in both eye care delivery and cost-effectiveness of care.

There are an estimated 17,000 practicing ophthalmologists and 33,000 practicing optometrists in the nation. Eye care services provided by them represents more than 5% of the total Medicare Part B payments, or \$4.5 billion in 2005. The National Ambulatory Medical Care Survey (NAMCS), conducted by the National Center for Health Statistics (NCHS), reported an estimated 47.3 million outpatient visits to ophthalmologists in 2004. This number does not include hospitalized patients or visits to optometrists. The current supply of eye care providers meets the patient demand; however, the demand for eye care services is artificially low. The demand significantly increases when the number of patients in whom eye care is indicated but not requested is considered. Of the population that is determined to be at high risk of serious vision loss, and which should have yearly eye examinations, less than half have had a complete eye examination in the past year. This shortfall in the provision of eye care services highlights the lack of access to needed care.

Access to Eye Care

Many factors affect the accessibility to eye care services. As with most healthcare services, affordability and availability of medical and vision insurance can limit access to needed eye care. With few exceptions, traditional health insurance coverage, including Medicare and Medicaid, does not cover well-eye examinations, preventive services, or the component of the examination for the determination of eyeglasses or contact lenses. Eye examinations must have a medical diagnosis that includes the use of the International Classification of Diseases (ICD) codes to be eligible for reimbursement. All well-eye examinations, or examinations for the determination of eyeglasses and contact lenses, are covered by a separate vision care benefit policy. The U.S. Bureau of Labor Statistics (BLS) reports that only 26% of full-time employees and 9% of part-time employees working in medium and large private companies in the nation have a vision care benefit. Without a separate vision care benefit, the cost of eye care services may keep away individuals who would benefit from preventive services and correction of refractive error.

Health disparities exist in eye care services and contribute to the lack of accessibility. Race, income, and educational level all have an effect on access to eye care. Lack of understanding of the eye and visual system also limits eagerness to seek out needed eye care. The Centers for Disease Control and Prevention's Behavioral Risk Factor Surveillance System (BRFSS) identified "no reason to go" and "cost or insurance" as the top two reasons for not seeking eye care services. In response, Healthy People 2010 includes 10 objectives for vision care. Having access to a regular provider of eye care as well as receiving a physician referral for eye care increases the likelihood that a patient will have access to these services.

Children Services

Children's access to comprehensive eye care services is particularly important. At birth, a child's visual system is not completely developed, and the eye and neuronal pathways associated with vision continue to develop during childhood. Children's visual systems have plasticity during a brief period

of time between birth and approximately 5 to 9 years of age. It is during this time that the visual system develops the ability to discern fine detail. During the time of plasticity, abnormalities of the eye or visual system that are not corrected can result in permanent uncorrectable visual disorders into adulthood. Amblyopia, commonly referred to as lazy eye, is an example of a visual disorder that is present at birth or early childhood and has the potential of being reversed if treatment is received during this time of plasticity of the visual system. However, many disorders of the visual system that are present in infants and children are undiagnosed due to the lack of an eye examination. This primarily occurs because of the lack of articulation of symptoms by children and the signs of the visual disorder going unnoticed by parents. If disorders of the visual system are not treated by the age of approximately 9, the visual deficit may become permanent.

Vision disorders in children can have lasting effects. It is estimated that 80% of learning is assimilated through the visual system, and 60% of children who are identified as problem learners have undetected vision disorders. The American Optometric Association (AOA) reports that 25% of children in the nation have significant visual disorders that impede learning. Some of these vision problems can persist into adulthood and can have implications as to which career choices are available to them. An example of this would be untreated childhood amblyopia, which results in one eye, or both eyes, with poor vision as an adult. Adults with amblyopia cannot pursue careers that would require binocular, or stereo, vision. Careers that require good binocular vision are (but are not limited to) airplane pilots, commercial vehicle drivers, and surgeons. This limitation of career choice into adulthood can translate into economic implications for society.

School vision screenings have been implemented in an effort to identify children with visual impairment. However, the implementation of school vision screenings is controversial. There is no universal standardized approach for the administration or content of school vision screenings. The components of vision screenings vary widely, and there is no consensus regarding which components are the most sensitive and specific to

identify visual disorders. In addition to no agreement regarding the content of school vision screenings, there is also no consensus as to which agency should oversee the screenings and who should administer these vision screenings, which can range from an untrained teachers aid to a physician. Also, there are no nationwide mandates for when school vision screenings should take place. Only 15 states require vision screenings for preschool age children. Parents of children who fail school vision screenings are issued a letter, which explains that the child needs a comprehensive eye examination, by an ophthalmologist or optometrist. However, due to the lack of access to eye care services and parents not understanding the scope of the vision problem, many children do not receive follow-up care after the screenings. Moreover, many parents view school vision screenings as a substitute for a comprehensive eye examination. Parents of children who pass school vision screenings may have a false sense of assurance that no vision problems exist with their child. Due to variability in the content and administration of school vision screenings, as well as the sensitivity of detecting visual disorders through the screening modality, a debate exists over the cost-effectiveness of vision screening versus comprehensive eye examinations for children. A small number of states currently require a comprehensive eye examination, performed by an ophthalmologist or optometrist, to be completed before a child enters into public kindergarten. However, this can create a financial barrier to a free public education if parents do not have health insurance or lack the financial means to afford the examination.

Adult Services

As the nation's average life expectancy increases, age-related eye diseases and disorders will increase in prevalence. This increase is compounded by the aging of the baby boomer generation, those born between 1946 and 1964. Many age-related eye diseases can lead to vision impairment and blindness. The Eye Diseases Prevalence Research Group at the Wilmer Eye Institute of Johns Hopkins University estimates that more than 3.5 million Americans are affected by blindness or

visual impairment. However grim this statistic may appear, many age-related eye diseases are preventable, or may be reduced in severity, with early diagnosis and treatment. Diabetic retinopathy, cataracts, macular degeneration, and glaucoma are the leading causes of preventable blindness in the United States. As with pediatric visual disorders, adult-age-related eye diseases may be asymptomatic in the early, most treatable, phase. Issues such as lack of health insurance coverage, lack of patient and provider education and understanding, as well as affordability impede access to adult eye care services. Increased access to eye care services would reduce the number of Americans living with blindness, which could have been prevented if timely diagnosis and treatment had been given. A 2006 study by David Rein and colleagues of the economic burden of major adult visual disorders in the nation's population 40 years of age or older estimated that the total government budgetary impact was \$13.7 billion, and the economic burden, including total direct medical costs, total direct nonmedical costs, and total productivity losses, was \$35.4 billion. Another study by Kevin Frick and colleagues of the economic impact of visual impairment and blindness in the nation estimated the loss of 209,000 quality-adjusted life years. Both of these studies highlight the significant economic burden of blindness and visual impairment. Increasing access to eye care services and the understanding of age-related eye diseases is paramount in attempting to reduce the total economic burden.

Outcome Measures

Until recently, there has not been a reliable and valid survey instrument to measure the outcome effect of interventions related to eye care services. Health-related quality of life (HRQOL) is considered an important outcome measure for healthcare. The National Eye Institute (NEI) devised a survey instrument to measure changes in HRQOL caused by eye diseases and their treatment. The NEI contracted with the RAND Corporation to develop a vision-specific HRQOL survey instrument to measure the outcomes of eye disease clinical trials. The National

Eye Institute Visual Functioning Questionnaire (NEI-VFQ) was developed to identify and quantify vision-related difficulties that are experienced by the visually impaired. The results of the collected data, from the NEI-VFQ pre- and post-treatment, measure the benefits of treatments that restore visual ability. A modified and shorter version of the survey, the VFQ-25, has been developed to measure changes in the difficulty of associated tasks after vision rehabilitation. Outcome measurement of various eye-related interventions is useful in establishing the overall effect of the intervention. These outcome measurements are also useful when comparing, and justifying, the cost interventions.

Gregory S. Wolfe

See also Access to Healthcare; Cost of Healthcare; Disability; Health Insurance; National Institutes of Health (NIH); Preventive Care; Public Health; Quality of Life, Health-Related (HRQOL)

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American Optometric Association (AOA):

<http://www.aoa.org>

National Eye Institute (NEI): <http://www.nei.nih.gov>

Prevent Blindness America:

<http://www.preventblindness.org>

F

FARR, WILLIAM

William Farr (1807–1883) had a major impact on the emergence of British social statistics, epidemiology, and demography in the mid-19th century and is considered to be a founder of medical statistics. Born in Shropshire, England, in 1807 to poor parents, Farr was effectively adopted by a local squire, Joseph Pryce, after his family moved to Dorrington. He was able to afford his medical education, receiving a licentiate from the Society of Apothecaries, through the inheritance from several benefactors. Farr married in 1833 and opened a medical practice in Fitzroy Square in London. His wife died in 1838 of tuberculosis, and he later remarried and had eight children.

During the 1820s and 1830s, Farr became interested in public health and medical statistics, and in the early 1840s, he played a key role in the development of a system of reporting the causes of death by medical personnel and the collection of these reports for local areas. Farr was also interested in comparative methods of classification of disease and causes of death; his work included comparisons of such methods in other European nations.

Farr served for many years as the Compiler of Abstracts of the Office of the Registrar General, a post that enabled him to serve as the major statistician of vital statistics for Great Britain. He was also a census commissioner for the 1861 and 1871 British censuses and served as president of the Statistical Society.

In 1849, there was a major outbreak of cholera in London that killed nearly 15,000 people. London, at the time, was one of the most populous cities in the world due to early industrialization, and as a result, the River Thames was heavily polluted with untreated sewage. While Farr was initially a proponent of the miasmatic theory of disease, the theory that diseases were airborne, his detailed mapping of disease incidence in London, including data on social class and elevation, laid the groundwork for much 19th-century public health research. Although Farr was unconvinced by John Snow's efforts to show that cholera was of water-borne origin, he provided Snow with data on individual deaths from that disease, and his geographically based orientation toward disease incidence helped lay the groundwork for the acceptance of Snow's theory of water-borne transmission.

Farr's contributions to demography are less well-known to epidemiologists. By linking accurate vital statistics to the 1841 British census, he was able to show how cross-sectional measures like the census could be linked to dynamic measures of population processes derived from age-specific birth and death rates. Lewis credits him with originating the net reproduction ratio (NRR), a summary measure of the rate at which a population is reproducing itself net of the mortality rate. Farr's work in improving the accuracy of British population and vital statistics led succeeding generations of demographers to see these as a dynamic system. This led to the development of the linked equations of general population theory and the theory of stable populations (by Lotka and Dublin in the

1920s). The fact that their mathematical model of population dynamics could be easily demonstrated by population dynamics in late-19th-century Britain led to its widespread acceptance by demographers. These models also led to the influential computer simulations of population processes of Coale and Demeny (the families of model populations) and the development of quasi-stable population models. Farr's work in showing how accurate, age-specific cause-of-death statistics could be linked to census tabulations provided epidemiologists with the ability to measure risks of incidence and death in different population groups.

Richard E. Barrett

See also Acute and Chronic Diseases; Epidemiology; Health Services Research, Origins; Mortality; Public Health

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London School of Hygiene and Tropical Medicine (LSHTM): <http://www.lshtm.ac.uk>

FEDER, JUDITH

Judith Feder is professor and dean of Georgetown University's Public Policy Institute in Washington,

D.C. Feder is a national leader and recognized expert on healthcare policy. Her areas of expertise include national healthcare reform, the uninsured, Medicare, Medicaid, and long-term care. She frequently testifies on Capitol Hill about various healthcare policy issues.

Born in Brooklyn, New York, Feder went on to earn a bachelor's degree from Brandeis University (1968) and a master's (1970) and a doctoral degree (1977) in government from Harvard University. She started her career working at the Brookings Institution and the Urban Institute before joining the faculty of Georgetown University in 1984.

Feder has occupied a number of key leadership positions in both the U.S. Congress and the Executive Branch of the federal government. In 1989, she was the staff director of the congressional U.S. Bipartisan Commission on Comprehensive Health Care, more commonly known as the Pepper Commission. The commission addressed national long-term care policy issues.

Feder is widely recognized for setting the stage for the national healthcare reform debate of the 1990s. She served as a senior official in the Clinton administration. Feder was the healthcare director of President-Elect Clinton's Transition Team. After President Clinton's inauguration, she was appointed the principal deputy assistant secretary for planning and evaluation in the U.S. Department of Health and Human Services. In that position, she was primarily responsible for developing the Clinton Health Security Act and chairing the working groups for the President's Health Reform Task Force. She also helped shape the administration's healthcare policy by working intensively with members of Congress and the national media.

After serving in the Clinton administration, she returned to Georgetown University in 1995. She became the dean of the university's Public Policy Institute in 1999.

In 2006, Feder decided to take her policy expertise to politics and ran for Congress as the Democratic nominee in Virginia's 10th District. Despite her eventual defeat, Feder's campaign garnered national attention and gave the 13-term Republican representative Frank Wolf his closest race in nearly 25 years.

Feder is a widely published scholar. Specifically, she has authored or coauthored five books on healthcare policy and over 60 articles in various

peer-reviewed journals, including the *New England Journal of Medicine*, the *Journal of the American Medical Association*, the *Milbank Quarterly*, *Health Services Research*, and *Health Affairs*.

She is a past chair and board member of AcademyHealth. Feder is also a member of the National Academy of Sciences' Institute of Medicine (IOM), the National Academy of Public Administration, and the National Academy of Social Insurance. She is a senior advisor to the Kaiser Family Foundation's Commission on Medicaid and the Uninsured and a member of the Commonwealth Fund Task Force on the Uninsured.

Ross M. Mullner

See also AcademyHealth; Equity, Efficiency, and Effectiveness in Healthcare; Healthcare Reform; Health Insurance; National Health Insurance; Public Policy; Uninsured Individuals; Vulnerable Populations

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FEDERALLY QUALIFIED HEALTH CENTERS (FQHCs)

A federally qualified health center (FQHC) is a type of organized healthcare provider defined by the Medicare and Medicaid statutes. FQHCs are intended to expand access to quality healthcare services for underserved and vulnerable, culturally

and linguistically diverse populations, in collaboration with other community providers.

FQHCs must provide a specific array of services to a community in which the population is found to be suffering from a lack of access to essential healthcare providers and services. They must be organized as public or private nonprofit entities. They also must be governed by an independent board of directors, the majority of whom are current consumers of healthcare from the organization who are representative of the community served by the FQHC.

The broad values enshrined in the construct of an FQHC include the following: comprehensive primary healthcare, focus on the changing needs of individuals throughout the life cycle, evidence-based medicine, responsiveness to the health status and needs of the community, and community-dominated governance. Specific program expectations are extensive and are set forth by the Bureau of Primary Health Care of the U.S. Public Health Service (PHS). Areas covered include the following: mission and strategy, approaches to underserved populations, cultural competency, strategic positioning, needs assessment and continuous quality improvement and performance, clinical program, organization of the system of care, service delivery models, contracting for health services, healthcare planning, clinical staff, consumer bill of rights and responsibilities, and clinical systems and procedures; and governance, compliance with board composition, governing board functions and responsibilities, and network and affiliations.

The key benefits of meeting the requirements and gaining FQHC status include enhanced Medicare and Medicaid reimbursement, eligibility for Section 330 and other specific federal grants and programs, medical malpractice coverage through the Federal Tort Claims Act, eligibility to purchase prescription and nonprescription medications for outpatients at reduced cost through the 340B Drug Pricing Program, access to the National Health Service Corps, and access to the Vaccine for Children Program.

Development

The health center movement that led to the development of FQHCs began with the creation of the

migrant health center program in 1962. The federal Migrant Health Act was enacted by Public Law 87-692, which added Section 310 to the Public Health Service Act (now currently authorized under Section 330G of the act). The Migrant Health Center program provides a broad array of medical and support services to migrant and seasonal farm workers and their families.

The initial success of the Migrant Health Centers was followed by the neighborhood health center demonstration projects initiated in 1965 as part of President Johnson's War on Poverty program. It was recognized that by addressing the untreated health problems of the poor, the economic burden of these communities could be reduced.

Health centers were envisioned as comprehensive health services programs oriented toward the needs of vulnerable and underserved populations. They made great strides in eliminating barriers to healthcare for the poor and underserved, ensuring continuity and quality of care, promoting the use of preventive services, and increasing community participation. Health centers also served as an economic engine for their economically disadvantaged communities by generating jobs in the local economy. Health centers were unique in providing access to a wide range of medical and nonmedical services and in their mission to serve all regardless of their ability to pay.

Despite major growth and numerous challenges over the past 40 years, the mission of health centers has remained the same—the provision of high-quality primary and preventive healthcare services to people in rural and urban medically underserved areas.

FQHCs include all organizations receiving grants under Section 330 of the Public Health Service Act, certain tribal organizations, and FQHC look-alikes. An FQHC look-alike is an organization that meets all of the eligibility requirements of an organization that receives a Public Health Service 330 grant but does not receive grant funding.

Section 330 of the Public Health Service Act defines federal grant funding opportunities for organizations to provide care to underserved populations. Types of organizations that may receive 330 grants include community health centers (Section 330E), migrant health centers (Section 330G), healthcare for the homeless

programs (Section 330H), and public housing primary-care programs (Section 330I). While the funding opportunities and sources vary, these, as well as school-based health centers (funded through the Healthy Schools, Healthy Communities Program) and FQHC look-alikes, are all related in that they all must meet the same standards and expectations set out for health centers under Section 330.

Among the many federal initiatives that have been aimed at the problem of access to healthcare services, the health center family of initiatives has enjoyed the widest and most persistent support. Throughout more than four decades of changing social, economic, and political environments, health centers have continued to receive growing federal support and attention. From their beginning as a component of President Johnson's War on Poverty program to the commitment from President George W. Bush, health centers have been viewed as an effective and appropriate means for extending the benefits of healthcare to the poor and uninsured.

In FY2002, President Bush proposed a multi-year initiative for the Federal Consolidation Health Center Program authorized under Section 330 of the Public Health Service Act. The President's initiative seeks to substantially expand and strengthen the safety net for those most in need by extending the availability of primary healthcare services to new and existing patients served by community health centers. In 2007, the federal Office of Management and Budget (OMB) ranked the health center program as one of the 10 most effective federal programs.

Current Status

By 2006, there were more than 1,000 FQHCs in the nation. They operated in each of the 50 states as well as Puerto Rico and the District of Columbia. They provided nearly 60 million healthcare encounters to more than 15 million individuals. More than 5 million of those individuals were covered under Medicaid programs, and nearly 6 million more of the patients had no insurance. In this endeavor, the health centers employed more than 97,000 full-time-equivalent employees. Health centers served approximately 12% of all the uninsured individuals (providing about 22%

of the uninsured ambulatory-care visits) in the nation and about 15% of the nation's population living below the federal poverty level (FPL). The majority of patients (59%) served were Latino or African American. The average medical cost per patient was \$117.

The National Association of Community Health Centers (NACHC) proposes that the services of FQHCs provide great potential for substantial cost savings throughout the nation's healthcare delivery system. FQHCs are particularly effective in addressing access issues that often drive patients to hospital emergency departments with noncritical health needs. This is a significant problem operationally and financially. Studies have estimated the annual cost of "wasted" or unnecessary emergency department visits in the nation to be in excess of \$18 billion. A recent study analyzing Medicaid claims data in four states concluded that Medicaid recipients relying on health centers for usual care are 19% less likely to use an emergency department for ambulatory-care-sensitive conditions than recipients using outpatient and office-based physicians for usual care. A 2004 study estimated savings to Medicaid programs of nearly \$1,000 per year per patient served in health centers as compared with other sources of care.

Overall, when compared with Medicaid patients treated elsewhere, health center Medicaid patients are between 11% and 22% less likely to be hospitalized for avoidable conditions; are 19% less likely to use hospital emergency departments for avoidable conditions; and have lower hospital admission rates, lower lengths of hospital stays, less costly admissions, and lower outpatient and other care costs. A 2006 study estimated savings of 30% to 33% in total costs per Medicaid recipient.

Future Implications

The effectiveness of FQHCs and the popularity of the community governance model within which they operate continue to make them a highly valued option in federal plans for addressing problems of healthcare access and the uninsured population.

Benn J. Greenspan

See also Access to Healthcare; Centers for Medicare and Medicaid Services (CMS); Ethnic and Racial Barriers to Healthcare; Health Professional Shortage Areas (HPSA); Medicaid; Medicare; Uninsured Individuals; Vulnerable Populations

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- Health Resources and Services Administration (HRSA): <http://bphc.hrsa.gov>
- Henry J. Kaiser Family Foundation (KFF): <http://www.kff.org>
- National Association of Community Health Centers (NACHC): <http://www.nachc.com>

FEE-FOR-SERVICE

Under fee-for-service payment mechanisms, the healthcare provider's income increases each time he or she renders a service. As with any form of provider payment, a decision to pay providers on a fee-for-service basis affects utilization, cost, and population health. Many healthcare policymakers and researchers argue that fee-for-service payment

mechanisms provide a strong economic incentive to overprovide services, many of which are costly, unnecessary, and may actually decrease the quality of patient care.

Economic Theory

A healthcare provider who is paid on a fee-for-service basis and who ignores patient preferences will provide services up to the point at which the fee just matches the cost of providing the service one more time. For example, as long as the fee paid for an additional dental examination exceeds the cost incurred by the dentist for providing the examination, the dentist will provide, and bill for, additional dental exams.

Whenever the fee does not reflect the value that a fully informed patient would place on receiving the service, the level of service provided will be either inefficiently low or inefficiently high. In markets for medical services, the fee might not reflect the patient's valuation because of ignorance or intermediation. Patients often do not know all the clinical risks and benefits of the services offered by providers, and they typically do not pay providers for their services directly but through an insurer. Lack of information may lead patients to underestimate the benefits of a service such as preventive care, prompting them to demand too little care, while intermediation, such as copayments and coinsurance, insulates patients from the full cost of the service, prompting them to demand too much care. By exposing patients to the full cost of a larger fraction of services than under traditional insurance, health savings accounts (HSAs) aim to eliminate the distorting effects of intermediation. The distorting effects of patient ignorance can be mitigated by education.

If the fee exceeds the patient's valuation of the service, providers will be tempted to overprovide services (supplier-induced demand), in the sense that a fully informed patient who paid out of pocket would have purchased a lower volume of the service than the provider is rendering. Nonprice mechanisms, such as implementation of treatment protocols, utilization review, and employment of gatekeepers to control the use of medical specialists, are designed to prevent the overprovision of services.

Hospitals

The problem of potential overprovision of services is perhaps most acute for hospital-based medical care because the patient typically has less ability to assess the costs and benefits of this type of service than in the case of prescription drugs, diagnostic tests, or office visits. In addition, hospital-based medical care is also more likely to be covered by the patient's health insurer than other types of medical care. While insurance reduces the patients' incentives to economize on hospital-based services, fee-for-service reimbursement reduces hospitals' incentives to control costs: As they are fully reimbursed for the cost they report, hospitals can pass on to insurers all fluctuation in cost.

Medicare, the federal health insurance program for the elderly in the United States, used a fee-for-service payment system until 1982, which encouraged hospitals to compete for patients and physicians by investing in expensive technologies, even if their clinical value had not been demonstrated. This "medical arms race" led to sharp increases in utilization and cost without commensurate benefits in health outcomes. In an attempt to slow the increase in the cost of hospitalizations among the elderly, in 1983, the Medicare program switched from a fee-for-service payment system to a prospective payment system (PPS), according to which hospitals receive a lump sum for each patient's hospital stay. This lump sum varies with the patient's classification into a Diagnosis Related Group (DRG) but does not vary with the hospital's actual resource use to treat the patient. Thus, the hospital is fully exposed to all fluctuation in cost and now has an incentive to minimize the resource use associated with each hospitalization.

Physicians

For physicians, the counterpart of prospective payment is a fixed monthly payment per enrollee (capitation payment). While capitation payment encourages physicians to avoid patients who are anticipated to require many visits or costly and time-consuming tests and procedures, physicians who are paid on a fee-for-service basis have the opposite incentive, namely, to attract patients such as the chronically ill or those with special

needs, who are expected to require many separately billable services. To increase revenue from fees, physicians paid by fee-for-service also have an incentive to underrefer patients to a colleague whose services they can perform themselves instead, even if the colleague would be a better match. Fee-for-service also creates an incentive to overrefer patients to specialty facilities in which the referring physician has a financial stake and to establish new physician-owned specialty hospitals, ambulatory surgical centers, and imaging centers.

For patients who are expected to remain with their physician for a long time, capitation payment encourages physicians to manage their patients' health proactively by providing sufficient preventive and primary-care services to reduce the incidence of disease and thus reduce costly future visits and treatment. By the same token, however, physicians paid on a capitation basis will be reluctant to test for diseases that, once diagnosed, raise the patient's number and service intensity of future visits. Physicians paid on a capitation basis will also attempt to minimize the resources spent on treating a patient's existing medical conditions. Recognition that physicians paid by capitation might underdiagnose and undertreat diseases, especially chronic conditions such as asthma, diabetes, depression, and cancer, has led some insurers to carve out of their capitation payments fee-for-service schedules for select diagnostic procedures, under which physicians' pay increases for each performance of a qualifying procedure or examination (pay-for-performance).

Lorens A. Helmchen

See also Capitation; Healthcare Financial Management; Health Economics; Medicare; Pay-for-Performance; Payment Mechanisms; Prospective Payment; Supplier-Induced Demand

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American Medical Association (AMA):

<http://www.ama-assn.org>

Centers for Medicare and Medicaid Services (CMS):

<http://www.cms.hhs.gov>

Healthcare Financial Management Association (HFMA):

<http://www.hfma.org>

FLAT-OF-THE-CURVE MEDICINE

Flat-of-the-curve medicine refers to applications of healthcare resources yielding no discernable or valuable health benefits. It is a level of intensity of healthcare that provides no incremental benefit. In health economic terms, it is the consumption of medical care resources to a point that the marginal (added) benefit relative to the marginal (added) cost is at or near zero. Flat-of-the-curve medicine is of concern because it affects the cost and quality of healthcare without improving health and medical outcomes. It also has implications for issues of access, financing, reimbursement, and the organization of healthcare. Understanding this concept, why it occurs, and how it might be addressed is beneficial to health services researchers and healthcare policymakers.

Variation in the use of healthcare and health outcomes in the United States is ubiquitous. Variation in the amount of healthcare delivered has been noted many times in seemingly comparable patients in terms of their health status and social demographic characteristics and the type and depth of health insurance coverage. This observation has persisted over time. Concern has been expressed that patients receiving costly high-intensity healthcare often do not have better health outcomes than those receiving cheaper low-intensity care. This finding is not confined to

the United States. The same phenomenon has been observed in other highly developed nations. This has led some researchers to conclude that differences in the intensity of healthcare play, at most, a minor role in explaining cross-sectional differences in health outcomes. Many health services researchers and healthcare policymakers have termed this phenomenon flat-of-the-curve medicine.

What Is Flat-of-the-Curve Medicine?

Popularized by health economists such as Alain Enthoven, Robert Evans, and Victor Fuchs, the concept underlying flat-of-the-curve medicine is analogous to the economic law of diminishing marginal returns; that is, as inputs are applied to a production process in successively larger amounts, there will be successively smaller increases in outputs. At some point, additional inputs may result in zero or even negative outputs. Used frequently in economics, this law has been applied in many instances to the production of many goods and services, environment, energy production, national defense, and medicine.

Figure 1 shows a theoretical curve to explain the concept of flat-of-the-curve medicine. An example would be the length of an inpatient hospital stay for a patient with a particular diagnosis. The horizontal x -axis in the figure reflects the inputs—in this case, cost in dollars for each day. These costs may be for personnel, equipment, supplies, overhead, and so on. The vertical y -axis reflects health outcomes depicted by improved health status. Each letter (A, B, C, D, and E) represents one inpatient hospital day. The first inpatient day (A) is clearly beneficial. Likewise, the second inpatient day (B) is beneficial but less so. Inpatient Day C is beneficial but less so than either of the previous days. That is, there is an added (marginal) benefit relative to the added (marginal) cost after the first inpatient day, but this benefit accrues at a diminishing rate. Finally, Inpatient Day 4 (D) and Inpatient Day 5 (E) add marginal costs but no discernable marginal benefit. In this instance, the marginal benefit after the third inpatient day relative to costs is zero. Likewise, additional inpatient days beyond C would add only costs without any concomitant benefits.

Issues and Implications

Flat-of-the-curve medicine raises many healthcare policy issues with many implications. In the above example, flat-of-the-curve medicine does not necessarily imply that there is no benefit with each inpatient day. But it does suggest that the marginal benefit, if any benefit at all, comes at a higher marginal cost. Issues can arise at any point along the curve. At the point where the curve becomes flat, there are no additional benefits from any combination of inputs. It may even be possible for the curve to bend lower at the tail end, as in the case of a poorer outcome. In that instance, additional costs would be associated with a worse outcome, as in the case, for example, of a hospital-acquired infection or a terminally ill patient.

Flat-of-the-curve medicine raises the issue of the amount and value of the benefit relative to the units of input, often measured by the common unit of dollars. How valuable the additional benefit is at any point along the curve is often subjective and debatable in absolute or relative terms. Medical practice often is subjective. Diagnoses are subject to uncertainty. There is often a range of possible treatments, with none being “the best” with certainty. Differing opinions also may be expressed among physicians, patients, families, or payers. Benefits may include added days of life; reduced mortality, morbidity, or disability; increased ability to function; reduced pain and suffering; or improvement in the overall quality of

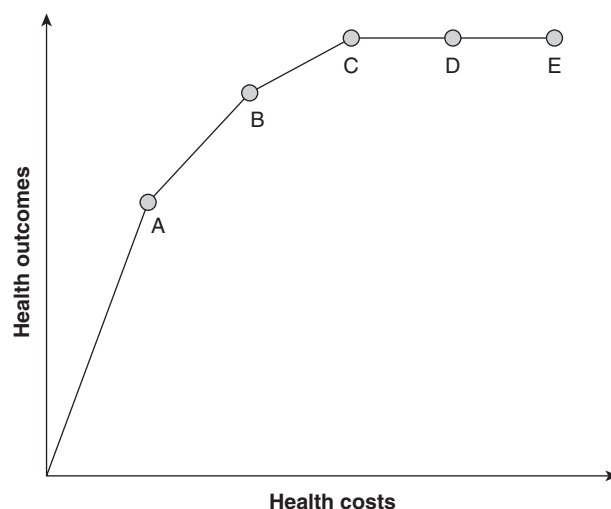


Figure 1 “Outcomes” and “Costs”

life. Some of the benefits are difficult to either quantify or value. Some may occur at extremely high marginal cost or may not occur at all. Sometimes one benefit may occur at the expense of others, as in the case of added days of life in a state of extreme pain and with an overall deteriorating quality of life. Benefits are not always easy to calculate, much less translate into a common unit of measurement. Also, often there is significant uncertainty in the anticipated benefit, especially when the patient is the unit of analysis. Widespread variation in health outcomes by treatment is commonplace.

The issue of flat-of-the-curve medicine becomes an important consideration depending on the source of payment. Generally, there is little or no concern if the increased intensity or cost of healthcare is knowingly borne by the individual, as expressed by his or her preferences, demonstrated by his or her out-of-pocket payment. Many individuals may not wish to get to the point where the marginal cost is zero, since any additional cost would be entirely at their expense with no proportionate benefit. A greater level of concern may arise if the source of payment is a spouse or other family member. A more difficult social problem may arise if the payment is borne collectively through private or public health insurance coverage. At this level, the scrutiny and expectation of benefit relative to cost may increase, since the cost is no longer just borne by the individual beneficiary but by a third-party payer. An individual may be much more willing to consume medical care to a point where the marginal benefit is zero when payment is by a third-party payer, whether private or public. Some individuals may not have any effective choice if they are uninsured or lack sufficient resources to pay regardless of their condition.

Why Does Flat-of-the-Curve Medicine Occur?

Several possible reasons for why flat-of-the-curve medicine occurs have been suggested. The various reasons may occur at the same time. Service volume may increase with an increase of healthcare providers in a geographic area. Or the presence of more medical specialists in an area may be reflected in a higher intensity of practice than is found in areas with a lower concentration.

Another possible explanation is that the standard of medical care in one area may be quite different from that in another. The standard of medical care in an area may be reflected by variations in length of hospital stay, the number and frequency of diagnostic tests, rates of surgical procedures, and rates of other clinical procedures. The medical school a physician attended may play a role, since medical training varies. Medical students at one institution may be trained to be more or less aggressive. The individual physician is a variable, with some willing to go much further along the curve than others. Attention to the interests of the patient, dedication to one's profession, and professional expectations can influence clinical decisions. Finally, financial considerations may influence the clinical decisions made by patients, family members, physicians, administrators, third-party payers, and others. The widespread use of third-party payment has led many to conclude that medical-care markets operate beyond the point of maximum efficiency and perverse incentives exist. Fully insured patients may want care to the point of no incremental benefit. Similarly, a physician may be inclined to provide care that provides no benefit for an insured patient but not for an underinsured or uninsured patient. Also, self-interest on the part of the physician may play a role, since one person's health spending is another person's income. A legal entitlement to a Medicare beneficiary or a Medicaid recipient is a de facto entitlement to providers. Incentives associated with fee-for-service practice or those associated with an ownership position in a medical facility may also cause clinical decisions to differ from those made by healthcare providers working under a capitation or salary arrangement.

Strategies to Deal With Flat-of-the-Curve Medicine

Several strategies have been implemented or suggested to address flat-of-the-curve medicine. For example, the nation's Medicare program in 1983 changed its policy of paying hospitals from a cost-based retrospective one, which created the incentive for hospitals to provide more care because they were reimbursed for it, to a prospective payment system (PPS), which pays hospitals a lump

sum for treating a given medical condition. The result was an immediate and sharp decline in the average length of hospital stays, with no apparent adverse medical effect. Other strategies have included increased utilization management and review, patient cost sharing, supply limits, aggregating the unit of payment (as in capitation), lump sum payments to hospitals for specific procedures, global budgeting, and efforts to increase competition. Others have suggested that flat-of-the-curve medicine be addressed by the greater use of cost-benefit or cost-effectiveness analysis and the controlled introduction of new clinical procedures and medical technology backed by clear evidence of their benefits.

Thomas W. O'Rourke

See also Cost Containment Strategies; Cost of Healthcare; Enthoven, Alain C.; Equity, Efficiency, and Effectiveness in Healthcare; Evans, Robert G.; Fuchs, Victor R.; Geographic Variations in Healthcare; Health Economics; Quality of Healthcare; Supplier-Induced Demand

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- Dartmouth Atlas of Health Care: <http://www.dartmouthatlas.org>

FLEXIBLE SPENDING ACCOUNTS (FSAs)

Flexible spending accounts (FSAs) are tax-sheltered programs established by employers. Employees contribute pretax wages to these accounts and may use the funds to pay for qualified healthcare expenditures. These expenditures include fees for uninsured physician or dental care, for example, but may also include the copays or deductible payments associated with otherwise insured medical expenses. In addition, the accounts may be used to pay for over-the-counter medications and things such as contact lens solution.

Overview

Flexible spending accounts are paid into with pretax dollars by employees and can be used to purchase qualified healthcare-related expenses. The Internal Revenue Service (IRS) defines what constitutes a qualified healthcare expense in FSAs. The IRS does not limit the amount of money that can be set aside in an FSA. Many employers, however, do set annual limits, often in the range of \$5,000 to \$10,000, and any monies that are not spent by the end of the year (or by March 15 of the subsequent year, at the discretion of the employer) are lost to the employee. On the other hand, once an employee's FSA is created, he or she may spend the entire annual amount to be deposited. For example, an employee may choose to set aside \$100 per month in an FSA for an annual total of \$1,200. In January, the employee could spend the entire \$1,200 on uninsured orthodontic care.

Moreover, if the employee were to leave the firm later in the same year, he or she would not be required to pay into the FSA. Analogously, however, if an employee were to leave the firm with a positive balance in his or her FSA account, those monies would be lost to the employee.

The provisions of FSAs are in marked contrast to health savings accounts (HSAs). Monies that are contributed to an HSA are owned by the employee and remain with him or her upon separation from an employer. More important, unspent HSA balances roll over to the next year, whereas an unspent FSA balance is forfeited annually. In

addition, while an individual may establish an HSA, only an employer can establish an FSA. Furthermore, HSAs require the holder individually or through his or her employer to have a qualified health plan, usually a high-deductible plan. In contrast, a firm that establishes an FSA program for its employees does not need to offer any health insurance plan.

Tax Savings

The tax savings associated with the use of FSAs can be substantial. For example, suppose an individual contributes \$100 per month, or \$1,200 per year, in an FSA, these contributions are tax sheltered. Additionally, suppose one has a marginal federal income tax rate of 28%, pays Social Security and Medicare payroll taxes of 7.65%, and faces a 5% state income tax rate. The individual or the family has a combined marginal tax rate of 40.65%. By putting \$1,200 in the FSA and spending it on qualified health services that the individual would have purchased anyway, the savings would amount to \$487.80 in taxes. Even if the individual does not spend the entire \$1,200, as long as a balance of less than \$487.80 is forfeited, the individual comes out ahead monetarily.

A less well-known and appreciated feature of establishing an FSA is that it allows employee premium contributions to employer-sponsored health insurance to be paid with pretax dollars. Workers do not have to explicitly direct premium contributions to the FSA for this purpose, as it is simply a feature of establishing an FSA. Moreover, an employer can set up a premium-only plan (POP) that allows employee premium contributions to be paid with pretax wages even without establishing an FSA.

Data on the extent to which employers offer FSAs and employees use them are not routinely collected. Offer rates appear to increase with firm size. William Jack and colleagues reported that 14% of small firms, 76% of large firms, and 83% of very large firms administered FSAs in 2003. Roger Feldman and Jennifer Schultz reported that among 15 Minnesota firms offering an FSA, 19% of singles without dependents and 33% of those with family coverage took coverage. The average annual contribution (converted to 2007 dollars) was \$530 for those with single coverage and \$988 for those with family coverage.

Economic Theory

Several testable hypotheses emerge from the economics of FSAs. The first is that households facing a higher marginal income tax rate will be more likely to participate in an FSA. Feldman and Shultz examined participation among 15 Minnesota firms in 1998. Higher marginal tax rates were associated with greater participation rates among those with family coverage but not those with single coverage. An increase in the marginal tax rate from 15% to 28% resulted in a near doubling of the participation rate. The marginal tax rate also increased the size of the FSA contribution. James Cardon and Mark Showalter used data from a benefits consulting firm from 1996. They concluded that participation increased with income and was also higher for those living in states with state income taxes. Interestingly, they also found that participants tended to spend out their accounts relatively early in the year, implying that the FSA effectively provided a no-interest loan for qualified healthcare expenditures.

A second hypothesis is that tax-sheltered treatment of employee premium contributions as a result of an FSA should reduce the premium elasticity of demand for employer-sponsored health insurance. If an insurance plan has a \$1,000 annual employee premium contribution, the presence of a 40% marginal tax rate and an FSA effectively reduces the premium contribution to \$600. As a result, the same premium contribution in an FSA will result in less plan switching than in a firm with no FSA. Bryan Dowd and colleagues examined premium elasticities in a sample of large public employers and concluded that the presence of an FSA reduced elasticities by over 50%.

Finally, one should expect FSAs to lead to larger employee premium contributions. Consider the premium contribution problem in the absence of FSA provisions. The exclusion of employer-provided health insurance from federal and state income and payroll taxes means that the entire premium should be paid for by the employer in the form of lower money wages to workers. This approach takes full advantage of the tax subsidy. However, employee premium contributions also serve to sort workers into health plans that reflect their preferences for

coverage, with higher employee premium contributions used to signal more generous plans. Thus, the tax incentives and the signaling incentives work in opposite directions. The former provide incentives for little or no premium contributions, and the latter provide incentives for potentially large premium contributions. In the presence of an FSA, the employee premium contribution is paid with pretax dollars, and the tax-induced incentive for small premium contributions is removed; however, this hypothesis remains to be tested empirically.

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See also Coinsurance, Copays, and Deductibles; Compensation Differentials; Consumer-Directed Health Plans (CDHPs); Health Economics; Health Insurance; Health Savings Accounts (HSAs)

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FLEXNER, ABRAHAM

Abraham Flexner (1866–1959) made enormous contributions to the quality of healthcare by improving the education offered at medical schools in the United States and Canada. As a result of this work, Flexner is considered one of the most important health services researchers of the 20th century. His on-site assessment of medical schools resulted in a landmark report, *Medical Education in the United States and Canada*, which was published by the Carnegie Institute for the Advancement of Teaching in 1910. This report received wide attention and acclaim. So critical was Flexner of poor-quality medical schools that many closed or merged, while others were forced to implement immediate improvements. In 1909, when Flexner began his investigation, the United States had approximately 150 medical schools; by 1915, the number had dropped to 96.

Born to German Jewish immigrant parents in Lexington, Kentucky, Flexner was one of eight children. Flexner went to Johns Hopkins University, where he received his bachelor's degree in 1886. After graduation, he returned to Lexington and worked for that city's public school system as an instructor. After 4 years, he formed his own college preparatory school, where he had the freedom to try out certain theories of classroom education, and there he became convinced of the value of progressive principles of education—among them, small classes, tutoring rather than lecturing, and learning by doing, principles that later influenced him when he undertook his investigation of medical schools. After many years of teaching, Flexner left Lexington and attended Harvard University, where he received a master's degree in 1906.

In 1908, Flexner's book *The American College: A Criticism* came to the attention of Henry S. Pritchett, president of the Carnegie Foundation for the Advancement of Teaching. Pritchett was impressed by Flexner's critical ability and his forceful manner as a writer, and he felt that Flexner would be the ideal person for a new Carnegie project: a response to a request from the American Medical Association's Council on Medical Education to carry out a survey of medical schools.

Although the Council on Medical Education had completed its own survey in 1906, the results were not widely published as there was reluctance on the part of physicians to publicly criticize other members of the profession. Pritchett recognized the inherent bias in medical involvement in the survey and therefore favored hiring a competent outsider to manage the task.

The need for a survey of medical schools was widely felt. The dismal quality of many medical schools was generally known, and in the Progressive Era at the end of the 19th century and the beginning of the 20th, the reform impulse was strong. Medical schools were already feeling the heat of that momentum when Flexner accepted the charge and began his research.

What Flexner lacked in healthcare experience, he made up for with his sound grasp of educational principles and his practical, clear-thinking, analytical mind. He also had the advantage of his employer's august name as a calling card. Because Flexner represented the Carnegie Foundation, a possible funding source, medical schools opened their doors to him.

Flexner began his preparation for the project with a review of medical education in the United States and Canada—its historical record—and the available critiques of that education. He determined that the best scientific/clinical medical education could be found at the Johns Hopkins University medical school, which was based on European models, and he hypothesized that his survey of medical schools would show that most would fall short of the high Johns Hopkins standard.

During his 16 months of fieldwork, Flexner visited 155 medical schools. He collected data from each on five key areas: (1) their admission requirements, (2) the size and qualification of their faculty, (3) the amount of funds available from the endowment and fees to support the school, (4) the quality of their laboratories and the training of their instructors, and (5) the connection of the school to clinical facilities (hospitals).

Flexner had a standard of excellence clear in his mind when he visited the medical schools. His vision of medical education was an ambitious one, centered on higher admission requirements, expanded instruction in the laboratory sciences, and clinical instruction based on access both to a large number and wide variety of hospital and

dispensary patients and to clinical laboratories for analysis and diagnosis. Flexner's plan also included a full-time medical faculty, standardized hospital record keeping, and control of a modern hospital whenever possible.

After his field study, Flexner wrote his famous report, *Medical Education in the United States and Canada*. Its findings were widely publicized. Contrary to the popular notion that the report was a relentlessly harsh critique of medical schools, unsparing in its condemnation of all institutions, over half of the report is historical background information, a discussion of Flexner's methods and findings, and recommendations for reform; the balance comprises school-by-school assessments.

The immediate reaction to the report by medical schools that fared poorly was often dismissive or antagonistic, but over time, in the wider community, the consensus of opinion was highly favorable: Flexner had done a great service for medical education. It was this view that held throughout his long life. After his death, however, historians have reassessed his report. Some now question Flexner's hastily formed judgments about the medical schools. The closing of medical schools resulted in a loss of physicians to nearby communities, however suspect their training might have been. Other historians fault the science-heavy curriculum Flexner imposed on medical education, which minimized the balancing influence of humanistic studies. Last, it has been argued that Flexner's report was merely a catalyst that accelerated the pace of existing reform. And the standards he espoused were generally accepted well before his report and were already reshaping the nation's medical education.

After publishing his famous report, Flexner also conducted surveys of medical education in England, France, and Germany. In 1912, he began working for the General Education Board of the Rockefeller Foundation as an assistant to the secretary, and in 1914 he became a trustee. As a board member for many years, Flexner had a say in the distribution of grants to colleges and universities as well as to primary and secondary schools.

Later in his life, Flexner was directly involved in founding the Institute for Advanced Study in Princeton, New Jersey, the world's first think tank. He was the institute's first director from

1930 to 1939. Among his successes in bringing distinguished scholars and researchers to the Institute was his recruitment of Albert Einstein in 1933.

Abraham Flexner died in 1959 at the age of 92. During his long life, Flexner's central interest—embodied in his landmark research and criticism and the recommendations of his famous 1910 report—was in elevating and standardizing medical education and, ultimately, contributing to the improved quality of healthcare services for all Americans. This is his greatest legacy.

James Hill and Samuel Levey

See also Academic Medical Centers; American Medical Association (AMA); Association of American Medical Colleges (AAMC); Health Services Research, Origins; Physicians; Quality of Healthcare

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FOCUSED FACTORIES

C. Wickham Skinner first introduced the concept of "focused factories" in a 1974 article in the *Harvard Business Review*. In this seminal article, Skinner, a Harvard Business School professor, applied the concept of focused factories to manufacturers in the United States, which at the time were experiencing a productivity crisis. Skinner believed that the nation's manufacturers were no longer competitive because they had very broad missions and produced too many products. To correct the situation, Skinner urged the manufacturers to focus each of their factories on a limited, manageable set of products and markets. He argued that focusing each factory's entire effort to produce a particular product would lower costs, especially overhead costs, and make each of the factories a competitive weapon.

Focused Factories in Healthcare

In healthcare there have been few attempts to formally define the concept of focused factories, and no standard definition exists. Regina H. Herzlinger, a Harvard Business School professor and a leading advocate of consumer-directed healthcare, defines healthcare-focused factories as integrated, multidisciplinary teams of health professionals organized around the needs and treatments of particular chronic diseases or disabilities. For example, she envisions diabetes-focused factories having teams of health professionals entirely focused on treating and controlling that disease.

Such teams would include cardiologists, dermatologists, endocrinologists, nephrologists, podiatrists, behavioral support specialists, and others. Focused factories would deliver services wherever patients needed them—in their homes and in pharmacies, community centers, and shopping malls, as well as in community and specialty hospitals. Focused factories also would provide the patients with all the medical information they wanted. Herzlinger views focused factories as an important component of consumer-driven healthcare.

Other researchers have empirically defined healthcare-focused factories as specialty hospitals, primarily facilities that specialize in cardiac,

orthopedic, or surgical care. A few researchers also include ambulatory surgery centers as healthcare-focused factories. Most specialty hospitals are physician-owned, for-profit facilities. Physicians often establish specialty hospitals because they want greater autonomy over treatment decisions and the care environment, a selected number of medical procedures having relatively high profit margins, and a larger share of the hospital's profit margin to increase their incomes. Physicians may directly own and manage the specialty hospitals and be their sole proprietor, or they may indirectly own and not manage the hospitals by purchasing equity stakes in them from corporations. Some corporations own a number of these facilities. Currently, there are more than 100 specialty hospitals in the nation, and the number appears to be growing. The number of ambulatory surgery centers is over 3,000.

Examples

The example of a healthcare-focused factory that is most often cited is Shouldice Hospital in Ontario, Canada. The hospital, an 89-bed, for-profit facility, is named after its founder, Edward Shouldice, who developed an innovative surgical technique for repairing hernias during World War II. Shouldice Hospital's entire focus is on the surgical repair of external abdominal wall hernias without complications. Surgeons at the hospital each perform 15 to 20 hernia repairs a week, as compared with other surgeons in Ontario, who perform on average only 1 per week. Because of Shouldice Hospital's narrow focus and high degree of specialization, it achieves excellent medical outcomes and a high degree of patient satisfaction. The hospital has very low complication and infection rates and one of the lowest hernia recurrence rates in the world. Its patients have short length of stays, and nearly all of them report being extremely satisfied with the care they received. Furthermore, the overall cost of care at Shouldice Hospital is significantly lower than at other Canadian hospitals.

Other examples of healthcare-focused factories are Aravind Eye Hospitals in India, which specialize in cataract surgery and eye diseases; Coxa Hospital in Finland, which specializes in endoscopic

and joint replacement surgery; Addis Ababa Fistula Hospital in Ethiopia, which specializes in obstetric fistula surgery; and the Diagnostic Treatment Centers in England, which specialize in elective surgery.

Controversy and Public Policy Issues

The concept of healthcare-focused factories is highly controversial and raises a number of important public policy issues. Proponents of focused factories, such as Herzlinger, argue that they provide a revolutionary promise of lowering the costs of care, improving quality, increasing innovations, increasing consumer choice, and promoting needed competition in healthcare. In sharp contrast, opponents, such as Arnold Relman, a Harvard Medical School professor and the former editor-in-chief of the *New England Journal of Medicine*, contend that the very concept of focused factories is a delusion born of unfamiliarity with the realities of medical care. Relman argues that independent physician groups and facilities such as centers for kidney dialysis, imaging centers, and cardiovascular specialty hospitals already provide some specific medical treatments and procedures. He believes that it would be wrong for the nation's healthcare system to be entirely or even largely based on thousands of independent, competing focused factories that specialize in treating only one ailment. He points out that patients often suffer from multiple ailments, they develop additional ailments over time, and they may develop new ailments from being treated. And to treat all these ailments, focused factories would need other specialists and facilities, which would be wasteful of resources. Last, Relman argues that focused factories would harm the continuity of patient care and lead to fragmented, chaotic, and lower-quality care.

Community hospitals, and the hospital associations that represent them, have strongly criticized specialty hospitals. Large community hospitals, most of which are not-for-profit facilities, fear that the increasing growth of for-profit specialty hospitals will siphon off the least complicated and best insured patients, leaving the community hospitals to treat complex, high-cost, poor, and uninsured patients. Community hospitals argue that such a shift would unfairly burden them and cut into their

already tight financial margins. And if community hospitals cannot compete with specialty hospitals, they will be forced to cut back on money-losing services such as emergency department care or to negotiate higher prices from payers. They contend that specialty hospitals may add unnecessary capacity that could hurt the quality of medical care in the community by reducing the volume of cases treated at each facility. They also assert that specialty hospitals may put patients' health at risk, because very sick patients may not get the same attention they would at large community hospitals. Last, specialty hospitals, with their physician ownership, may create incentives for excess medical care.

Federal Moratorium

Because of the debate over the growth of specialty hospitals, the U.S. Congress in 2003 enacted an 18-month specialty hospital moratorium. Specifically, Congress prohibited the Centers for Medicare and Medicaid Services (CMS) from issuing Medicare provider numbers to new specialty hospitals, thus preventing them from billing Medicare. The moratorium also temporarily prohibited physician investors in these hospitals from referring Medicare patients to facilities in which they had a financial interest. The moratorium expired in 2006, and the CMS once again is issuing Medicare provider numbers to new specialty hospitals, permitting them to expand, unless they are prohibited by specific state laws.

Future Implications

There is very little empirical evidence concerning the advantages or disadvantages of healthcare-focused factories. Given this lack of evidence, it is not clear whether public policies should be developed to encourage or discourage their further development. Resolving this and other questions concerning focused factories is important because it is likely that more specialized, niche-type healthcare facilities rather than large, all-purpose community hospitals will increase in the future.

Ross M. Mullner

See also Certificate of Need (CON); Competition in Healthcare; Consumer-Directed Health Plans (CDHPs); Economies of Scale; Hospitals; Public Policy; Regulation; Volume-Outcome Relationship

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- Physician Hospitals of America (PHA): <http://www.physicianhospitals.org>

FORCES CHANGING HEALTHCARE

Healthcare in the United States is undergoing profound changes. These changes are driven by a number of demographic, economic, sociologic, and technologic forces, including population demographics; retiree healthcare benefits; payer market consolidation; patient cost sharing; transparency in costs, quality, and outcomes; value-based purchasing; globalization in healthcare; consumerism; technology; and personalized medicine. Each of these 10 forces is discussed below.

Population Demographics

A very visible force that is reshaping the nation's healthcare is the aging of the population and the workforce. The population in general is aging; those who are already elderly are living longer; and the healthcare workforce, particularly in nursing, the largest healthcare profession, is aging. This force suggests that there will be increasing demand for care, which, in turn, will increasingly tax the current diminishing workforce.

Retiree Healthcare Benefits

Many of the nation's employers have ceased to provide, or are in the process of discontinuing, healthcare benefits to their retirees. Employers continuing retiree health benefits are shifting more of the cost to retirees. The Agency for Healthcare Research and Quality (AHRQ) reports that only 13% of private-sector employers offered health benefits to their retirees in 2005, down from 22% in 1997. Even many large employers are not offering their retirees healthcare benefits. It appears that the implementation of the recent Medicare prescription drug benefit in 2006 further encouraged employers to have their retirees rely solely on public-sector healthcare benefits, despite the federal subsidy to employers maintaining their retiree plans.

Payer Market Consolidation

The nation's health insurance industry has undergone tremendous consolidation, and this can be expected to continue, albeit less rapidly, until such a time when mergers and acquisitions trigger a major reaction from government antitrust agencies. While consolidation has been under way for some time, a key turning point occurred in 2004 with the merger of Anthem and WellPoint Health Networks—the largest ever managed-care merger, which encompassed a \$16.4 billion deal that has increased the plan's membership to about 28.5 million enrollees. WellPoint, Inc., has since acquired Empire Blue Cross, Blue Shield, moving into the eastern part of the country and thereby becoming more of a national company. The United Health Group has also made major

acquisitions and become a national player. These two health insurance giants are changing the face of the health insurance market as they assume a dominant position, and thereby offer less flexibility in reimbursement to many healthcare providers.

Patient Cost Sharing

In recent years, consumer-directed healthcare (CDHC) has emerged as one of the most potent ideas in healthcare reform. However, CDHC means different things to various people. CDHC, which involves enrollment in consumer-directed health plans (CDHPs), refers to insurance that provides financial incentives for consumers to become more involved in their healthcare-purchasing decisions. Most of the literature uses the term *consumer-directed health plans* to refer to any high-deductible insurance plan. Typically, *high-deductible* denotes a plan with a deductible of \$1,000 or more. High-deductible plans are sometimes coupled with personal health savings accounts (HSAs). HSAs are tax-advantaged health savings accounts that may be used to pay for qualified medical expenses. HSAs must be paired with a health plan whose minimum deductible is \$1,000 for individuals or \$2,000 for families in 2008 and the annual out-of-pocket expenses do not exceed \$5,000 for individuals and \$11,200 for families. Health reimbursement accounts (HRAs) are similar to HSAs but are owned by employers and do not need to be coupled with a high-deductible plan.

In 2005, about 10% of privately insured nonelderly American adults were enrolled in a plan with a high deductible; about 10% of them had an HRA or HSA. One fifth of employers offering health insurance offered a high-deductible plan, and about 4% offered such a plan with an HRA and HSA option. However, demand for these plans appears to be growing. A recent survey of these plans found that enrollment had more than tripled since early 2005, reaching 3.8 million in 2007. Predictions about the future growth of the HSA market are also impressive. One recent forecast is that the market will expand to 15 to 30 million enrollees over the next 5 to 10 years. The important point is not the exact number of people enrolled in HSAs but rather that

these new insurance products are symptomatic of a more widespread movement toward shifting more of the cost—and the decision making and the wellness accountability—from businesses to consumers.

Transparency in Costs, Quality, and Outcomes

The nation is steadily moving toward a value-based purchasing healthcare economy. This has mainly been driven by the major purchasers of care, such as the Centers for Medicare and Medicaid Services (CMS), and large employers who are seeking to quantify the value of the healthcare dollars they spend. Indeed, now more than ever, there is a growing movement by the purchasers of healthcare to demand documentation on patient care quality, along with a more transparent approach to pricing, particularly in the hospital sector. In addition, large employers, labor organizations, and consumer advocacy groups are working hard to make sure that any healthcare reform includes the requirement that information on healthcare costs and quality is collected and made available to the public. Additionally, many hospitals and health systems are now beginning to share their cost and quality information with the public. A few of them have gone so far as to commit to full disclosure of their performance (via pricing and quality indicators) to consumers on the Internet and through direct mailing to consumers.

Value-Based Purchasing

It appears that the nation's health insurance plans will move much more aggressively in the next several years to both measure the quality of physicians and hospitals and reward those with better performance records and improved outcomes. In part, this movement has been stimulated by the growing recognition of the large variance across providers in quality. Widespread quality-of-care problems demonstrated that the nation is not getting the full value for its healthcare expenditures. Indeed, there is growing national evidence of inappropriate medical care and widespread and dangerous medical errors. Research studies have shown that Americans only receive about half of

the recommended care. Furthermore, healthcare spending varies greatly from region to region, with no discernible improvement in quality of care or health outcomes associated with the higher outlays.

Globalization in Healthcare

There is a growing trend toward globalization in healthcare, which is called *medical tourism*—the basic practice of traveling to a distant location or even another country to obtain healthcare services. The increase in the popularity of medical tourism appears to be the result of the uneven quality of care in local communities, the high costs of healthcare, the long wait times for procedures, the ease and affordability of international travel, and improvements in technology and standards of care in many countries of the world. Most medical tourists seek elective services such as aesthetic treatments (cosmetic surgery) or orthopedic surgery. Countries such as India, Malaysia, Singapore, and Thailand are positioning themselves as medical destinations. In general, physicians trained at the major medical centers in North America and Europe staff hospitals and clinics in those nations catering to medical tourism. Moreover, most of these physicians are board certified in the United States. Furthermore, many American medical schools are forming partnerships with Asian hospitals to penetrate this market. In the mid-1990s medical tourism did not exist; however, the number of medical tourists to India alone has tripled in the past 4 years from 150,000 to 500,000.

Consumerism

Patients are increasingly demanding a greater role in the decisions that affect their healthcare. The development of the Internet and the availability of online healthcare information have enabled patients to take a more active role in their health management. Consumerism in healthcare is based on the idea that individuals who are financially accountable for their wellness and who have better access to information as well as more control over their own healthcare will make better decisions

about treatment and provider options. If consumers could better understand and more effectively use health services, community health status could improve, the value of healthcare to the consumer could be enhanced, and the rate of increase in healthcare costs could be reduced.

To enhance consumerism, healthcare providers can take several actions. One is to provide clear communication, which means listening deeply and with an open mind, not only to the consumers but also to the full spectrum of the stakeholders. Another is to create consumer-focused systems, which involves improving internal systems and working with others to remove barriers to engaging consumers rather than focusing on the mechanics of the care. Providers should also simplify pricing, taking into account the patient's medical condition, insurance coverage, discount eligibility, and past medical history. Improving patient safety, which involves developing safe and high-quality care-delivery systems such as an electronic health record system and an underlying clinical system to support it, is another avenue for improving consumerism. Also, serving the underinsured to make consumers' needs paramount, regardless of their ability to pay, will also enhance consumerism. Last, providers should provide accountability, which involves developing explicit action plans to address community benefit and then reporting on how those plans were implemented.

Technology

Technology has far-reaching implications for changing healthcare because it affects both the processes of care and the way organizations work. Among the broad-based effects of technology is the development of health information systems and the genomics that are contributing to the biotechnical advances in care. Health information systems are increasingly being used to decrease healthcare costs by standardization and improved data capture to support both billing practices and care decisions. Information systems have the potential to reduce the rate of increase in healthcare costs, which are predicted to reach 19% of the nation's gross domestic product (GDP) by 2014. Information systems enable managers and organizations to more effectively capture cost and

quality indicators that are used to improve practice and reward performance, thereby improving the efficiency and efficacy of healthcare.

Technological advances are also affecting care itself. Less invasive procedures, increased portability of equipment and supplies, and advances in diagnosis and treatment have made it possible to change the locus and type of healthcare procedures. Technology also affects consumer expectations for healthcare. Unlike other industries, new technologies in healthcare are additive, often raising consumer and provider expectations. Both consumer and provider expectations are shaped by experiences with other, more technologically advanced enterprises, such as the travel and banking industries. Healthcare is just now beginning to develop the information systems that will improve transactions among providers, consumers, and financiers of healthcare. Technology has the potential to change healthcare delivery. As healthcare technology advances, problems previously thought to be life threatening will begin to look more like chronic diseases. Nanotechnology, genetics, and biomedical advances are changing both consumer and provider expectations for health, care, and treatment.

Personalized Medicine

Personalized medicine refers to the development and treatment of disease and disease propensity with interventions based specifically on a person's genetic profile. Advances in genomics, pharmacokinetics, and computer technology are quickly making personalized medicine a reality. A critically important challenge will involve how healthcare payers can provide a reimbursement policy that will encourage innovators to tailor drugs, biotech products, and perhaps even medical devices to the metabolism and other characteristics of different subgroups in the population, based on factors such as age, gender, and ethnicity. Different groups respond in very different ways to these products. Yet if the market is subdivided, will the payback of return on investment justify the cost of bringing "customized" products to the market?

Personalized medicine also implies that treatment will be made personal, a trend already under way. For example, patients are informed before their office visits about their care, and they evaluate

and compare the information they have obtained with that provided by their physician or caregivers. Customers expect to be a part of the planning process for their health, discussing a plan of action for their own healthcare. As patients become more knowledgeable about their healthcare, the time pressure on providers can be expected to increase. In 2004, the reported median time physicians spent with patients on an office visit was 14.7 minutes. The challenge for providers lies in applying expertise to collaborations with consumers to evaluate information from the Internet and available up-to-date scientific evidence. Just as technology is increasingly an enabler assisting caregivers in diagnosis and treatment, it is also an enabler for patients, who assume more ownership of their own health. Personalized medicine, which will likely become personalized healthcare over time, is one of the most exciting aspects of changing healthcare.

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See also AARP; Center for Studying Health System Change; Congressional Budget Office (CBO); Consumer-Directed Health Plans (CDHPs); Cost of Healthcare; Health Insurance; Leapfrog Group; Medical Travel

Further Readings

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- Center for Studying Health System Change (HSC): <http://www.hschange.com>

Congressional Budget Office (CBO):

<http://www.cbo.gov>

Institute for the Future (ITF): <http://www.iftf.org>

National Center for Policy Analysis (NCPA):

<http://www.ncpa.org>

FOR-PROFIT VERSUS NOT-FOR-PROFIT HEALTHCARE

One distinctive feature of the U.S. healthcare system is its mix of nonprofit, for-profit, and public ownership of hospitals, nursing homes, and health insurers. Nonprofits dominate the hospital sector. About 53% of the nation's hospitals are nonprofit, 19% for profit, and 28% government owned, including local, state, and federal hospitals. For-profit ownership is the norm in the nation's nursing home industry, with 62% for profit, 31% nonprofit, and 7% government owned. There are more than 1,300 health insurers and health plans in the nation, the overwhelming majority being for-profits, but nonprofit insurers and health plans are among the largest and cover approximately one quarter of the privately insured population.

Within both for-profit and nonprofit sectors, ownership structures vary. For-profit ownership can include individual proprietorships and partnerships or publicly traded or privately held corporate ownership, with corporate ownership dominating the for-profit hospital, nursing home, and insurance sectors. Nonprofit organizations are restricted by law from distributing profits or net revenues to those outside the firm (the "noninurement" requirement). They may be tax-exempt at the federal, state, or local level. Nonprofit hospitals and nursing homes are generally owned by local corporations, with self-perpetuating, locally drawn boards, although a significant number are owned by or affiliated with religious orders or denominations or are part of local or regional systems.

Several issues arise in the analysis of ownership in health services research. One is why nonprofits play such a large role in providing health services and insurance. This issue can be approached from both a theoretical and a historical perspective. A second issue is whether, because of the differences

in organization, management, or incentives, the performance of nonprofits and for-profits differs in ways that should matter to patients, payers, or regulators. Extensive research has been conducted on these issues, involving both direct comparisons of nonprofit and for-profit entities and examination of cases in which nonprofits convert to for-profit status.

Theories of Nonprofit Creation and Support in Healthcare

Three broad sets of theoretical explanations have been put forward to explain the creation and ongoing support of nonprofit organizations in healthcare. The first builds on concepts of asymmetrical information, principal-agent problems, and the difficulties of monitoring performance and ensuring quality and fair dealing. Kenneth J. Arrow was among the first to present this view in his classic 1963 article, "Uncertainty and the Welfare Economics of Medical Care," in which he notes that the very word *profit* is a signal that denies a trust relationship. He goes on to say that physicians try to avoid being seen as profit maximizers in their trust relationships with patients. And from these special relationships come various forms of ethical behavior, which leads to the relative unimportance of profit making in hospitals. Henry Hansmann, in his 1996 book, *The Ownership of Enterprise*, expands on this theme, noting that because of the high costs incurred by customers of some firms, nonprofit firms such as hospitals are set up whose managers hold them in trust for them. Other reports in the literature expand on these models of nonprofits as a response to agency and trust problems.

A second explanation put forward for the creation of nonprofits is that they address consumer or charitable needs by creating organizations to deliver goods and services that are not commercially viable. This has been identified as the original impetus for the creation of nonprofit hospitals, insurers, and health plans. Nonprofits are often classified as donative, depending on contributions for support of their activities, or commercial, depending on revenues from the sale of goods or services. Many blend these two components, and over time, the mix of donations and commercial revenues can shift, as it has in the hospital industry. Furthermore,

historically it has been the case that even when opportunities for commercially viable for-profits are established, nonprofits do not cede the field but often remain active competitors in the market.

Both of these theoretical explanations for the rise of nonprofits lead to predictions regarding observable differences in the behavior of for-profit and nonprofit firms. For-profit firms are assumed to be profit maximizers (and thus cost minimizers), while nonprofits are assumed to have other goals, such as prestige, size, quality, charity, staff satisfaction, and donor satisfaction, which are to be implemented within a break-even constraint or balanced with a profit maximization thrust. There is no agreement in the literature concerning which of the other goals predominate, perhaps reflecting the fact that objectives may vary across nonprofits, even those within the same industry. Nonetheless, it is generally predicted that nonprofits in healthcare will be less efficient and have higher costs, offer lower prices, be less profitable, have higher quality (particularly when quality is hard to monitor), be more likely to provide unprofitable services and slower to adopt profitable services, provide more community benefits generally, and be less likely to close.

The third set of theoretical analyses seeks to explain the continued presence of both nonprofits and for-profits in markets, belying models that predict that one form would dominate and drive the other out. Four sets of explanations have been offered. One is that it is simply a matter of timing—that the firms coexist as markets shift from a state that advantages one form to a state in which the other form is advantaged. Another explanation put forward is that the continued presence of different firms is supported by consumer heterogeneity; that is, some consumers cannot detect agency failure and rely more on nonprofit status as a signal, while others who believe they can detect such failures are more willing to buy from for-profit firms. A third explanation is that different forms have asymmetric advantages, such as access to different sources of capital, that allow nonprofits and for-profits to occupy different market niches or exploit different advantages when competing in the same niche. In this model, institutions, once established, operate to exploit the environment and strengthen their advantages through law and regulation. A fourth explanation, which complements the third, is that

regulatory pressures, adoption of successful models from the other ownership form, and consumer or community norms and expectations encourage nonprofits and for-profits in the same markets to mirror one another, which reduces the likelihood of one or the other being pushed out of a market. This last explanation has important consequences for comparing nonprofits and for-profits, since it suggests that differences between nonprofits and for-profits may not be observed in within-market comparisons but only in cross-market comparisons structured to differentiate between nonprofit-dominated and for-profit-dominated markets.

History suggests that consumer preferences for nonprofit over for-profit hospitals, nursing homes, or health plans has not been a major element sustaining nonprofits. Rather, the evidence supports the model of donative or charitable creation and the roles of asymmetric advantage and mimicry in sustaining both nonprofits and for-profits in the same markets. The first U.S. hospitals were nonprofit institutions created for the care of the poor, supported by donations. After the invention of anesthesia and antisepsis, hospitals could offer services that could not be easily provided at home, and for-profits entered the hospital market. By 1910, for-profit hospitals were more common than nonprofits. Differential access to capital has influenced the relative growth and decline of for-profits in the U.S. hospital system over time. Many for-profits closed during the Depression, while nonprofits were sustained by community contributions and the creation of hospital insurance programs that differentially favored nonprofit hospitals. The federal Hill-Burton program created additional subsidies for the expansion of nonprofit hospitals after World War II. The establishment of Medicare in 1965, with payment rules offering benefits to for-profit hospitals, encouraged their expansion and the purchase of individual-proprietorship and partnership-owned hospitals by corporations.

Nursing homes were developed as homes for the aged or infirm, many as individual proprietorships or partnerships, some, sponsored by religious or community groups, as nonprofits. The Social Security Act of 1935 required states to develop licensure programs for nursing homes. The establishment of Medicare and Medicaid in 1965 created substantial revenue streams for nursing

homes, encouraging expansion of their numbers as well as the growth of for-profit corporations owning chains of nursing homes and differentiation of facilities by levels of service.

In the first part of the 20th century, few insurers offered health insurance, fearing adverse selection. Modern health insurance in the United States was introduced during the Depression as hospitals, facing substantial numbers of patients unable to pay, sponsored prepayment programs for hospital care. These plans were largely created under state legislation that established separate regulations and financial standards for nonprofit organizations. Similar physician plans were soon created as well. The earliest health maintenance organizations (HMO) were likewise created as nonprofits. Only once the commercial feasibility of health insurance and prepaid health plans was established did for-profit insurers enter the market in substantial numbers. The comparative advantage of nonprofit or for-profit insurers and health plans over time appears to be influenced by the regulatory advantages offered to nonprofits, the cost-based payment systems nonprofit insurers negotiate with hospitals, and greater access to capital available to for-profit firms. The 1980s saw a series of nonprofit to for-profit conversions of a significant number of health plans, a trend that continues with the conversion of several of the largest of the nation's Blue Cross and Blue Shield plans.

Public opinion surveys reinforce the judgment that donative and commercial factors, not trust and agency issues, better explain the development of nonprofit and for-profit providers of hospitals, nursing homes, and insurance services. Surveys from the 1980s and 1990s found those surveyed to be unsure about the ownership of the institutions they used and belief to be mixed about the relative quality and efficiency of for-profit and nonprofit hospitals, HMOs, and health insurers.

Comparisons of Cost, Quality, and Community Orientation

Regardless of whether public support for the creation of nonprofits is based on concerns that patients will be exploited, a significant public policy debate emerged in the 1980s and continues to the present about the desirability of for-profit

providers supplanting nonprofits, through either for-profit expansion in the marketplace or conversion of nonprofits to for-profit status. This has resulted in an extensive literature looking separately at hospitals, nursing homes, and insurers, comparing for-profit and nonprofit cost and efficiency, quality, and provision of community benefits. The community benefits examined are broad and not always clearly defined but include lower prices (i.e., failure to fully exploit local market power), charity care (or improved access for low-income populations), and maintenance of unprofitable but needed community services. Conversions from nonprofit to for-profit status have been a focal point of this debate and, as a result, have led to a significant body of research.

Below is a summary of this literature for hospitals, nursing homes, and health plans.

Hospitals

Costs and Efficiency

The relative costs and efficiency of nonprofit hospitals in comparison with for-profit hospitals has been extensively studied. This research has used a wide range of data sets, including Medicare cost reports and state hospital financial reports; alternative modeling strategies (e.g., economic cost functions, data envelopment analysis, and stochastic frontier regression); different covariates; and functional form; it has also examined different time frames. The research has been subjected to meta-analysis. The majority of studies either find no difference in costs or efficiency between nonprofits and for-profits or find that nonprofits have lower costs and greater efficiency than for-profits. The prediction from theory that nonprofits would be less efficient is not supported.

Prices and Net Revenues

Prices and net revenues (or profits) of for-profit and nonprofit hospitals have been less widely studied than the relative costs and efficiency of these forms. These studies have found either no statistically significant difference in prices or profits or higher prices or profits in for-profit hospitals. The studies do not allow the source of differences in profits or net revenues to be clearly identified, although differences in pricing, discretionary

charity care, and decisions by for-profits to locate in areas with better-insured populations have all been suggested as explanations, and there is some research to support each of these claims.

Quality of Care

Study of the quality of hospitals has been hampered by limited data. Many studies have focused on mortality differences, with varying levels of control for patient-specific risk adjustment. More recently, data on other measures of quality have become available, and studies have incorporated these measures. The most complete systematic analysis of this literature examined 25 studies looking at mortality and 13 looking at other measures of quality, including surgical complications and medication errors. It found that a majority of these studies found no statistically significant difference between for-profit and nonprofit hospitals, but it also found that those studies that were representative of the United States as a whole tended to find lower quality of care among for-profit than among nonprofit hospitals. Another study comparing hospitals using the current Centers for Medicare and Medicaid Services (CMS) Hospital Compare measures of processes of care reinforces this conclusion that for-profits have consistently underperformed nonprofit hospitals.

Community Benefits

The two most widely considered community benefits for which comparisons have been made between nonprofit and for-profit hospitals are charity care and provision of unprofitable services. While studies have found substantial variation across states in the relative provision of charity care by ownership, on average, for-profit hospitals have been found to provide less charity care than nonprofits. At least some of this difference appears to be a function of location decisions by for-profits. For-profits have also been found less likely to offer unprofitable services than nonprofit hospitals, and they are more sensitive to changes in profitability over time.

Hospital Conversions From Nonprofit to For-Profit Status

There have been several waves of conversions of nonprofit hospitals to for-profits. These

conversions or purchases have raised issues of fair valuation of the assets of the nonprofit and concerns about maintenance of charity care and services within the community. State-specific studies of conversions of nonprofits have found that, on average, they are similar to for-profits in their states in the levels of charity care they provide, although a national study concluded that charity care declined postconversion. Studies also suggest that after conversion there is no evidence of reductions in charity or services by the converted hospital. One 1997 study of conversion trends from 1980 to 1993 found that while nonprofit to for-profit conversions were the focus of public concern, there were also a substantial number of for-profit to nonprofit conversions.

Nursing Homes

Costs and Efficiency

Studies consistently find that for-profit nursing homes have lower costs than nonprofit nursing homes. Examination of the sources of cost differences has found wages and registered nurse staffing to be higher in nonprofit homes. No studies have adequately controlled for differences in quality across the two ownership types, a significant omission given that (as described below) quality has been found to be higher in nonprofit facilities. Thus, while cost differences are observed, there have been no sufficient studies of efficiency differences across the forms.

Prices

Limited studies exist of the prices charged private-pay nursing home patients, and they are mixed as to whether nonprofits or for-profits have lower charges.

Quality of Care

A large number of studies have compared the quality of care at for-profit and nonprofit nursing homes. Across a wide variety of measures—mortality, complications such as infections or bedsores, measures of processes of care, and regulatory deficiencies, for-profit nursing homes have been found to have lower quality.

Community Benefits

Nursing homes have not been expected to offer as wide a range of community benefits as hospitals. One community goal has been to ensure access to nursing homes for Medicaid patients. For-profit nursing homes have been found by researchers to be more likely to admit Medicaid patients, thus disproportionately offering benefits to the community in this area.

It was suggested above that differences between nonprofits and for-profits may not be observed in within-market comparisons but only in cross-market comparisons structured to differentiate between nonprofit-dominated and for-profit-dominated markets. There has been some research using this framework examining the nursing home industry. One study attempted this comparison, using expansion of nursing home use as a measure of increasing consumer value from nursing home services. It found higher use in communities with more nonprofit nursing homes, concluding that more quality of care per dollar could be achieved by encouraging a greater share of nonprofit nursing homes in most market areas in the nation.

Health Insurers and Health Plans

Studies of the relative performance of nonprofit and for-profit health insurers and health plans have been limited. Conversions of nonprofits to for-profits have contributed significantly to the interest in this topic, although the research specifically studying conversions has been limited.

Costs, Efficiency, Pricing, and Profitability

Comparing the costs, efficiency, pricing, and profitability of health plans is complicated because of the multiple measures that might be examined. Premium levels, percentage of collected premiums paid as benefits, and administrative costs have been examined, but the interpretation of differences can be challenging. For example, higher administrative costs have been interpreted as a sign of inefficiency and alternatively as a measure of aggressive cost and utilization management.

The evidence for greater efficiency, lower administrative costs, lower payment to providers through more aggressive negotiations or rate setting, or higher profits of one form over the other is mixed.

There is limited evidence that suggests but does not conclusively demonstrate that both payments to providers and the proportion of premiums paid to providers are lower for for-profit plans and for Blue Cross plans following conversion, this difference being associated with higher profits. Furthermore, better-controlled studies with more data are required to resolve the questions asked in this research.

Quality

The relative quality of health plans has been assessed in a variety of ways. Given the concern among consumers that insurers might skimp on needed care, issues of trustworthiness are also frequently addressed in comparing quality across plans. Studies have been conducted comparing objective measures, such as the Healthcare Effectiveness Data and Information Set (HEDIS) measures of the National Committee for Quality Assurance (NCQA), disenrollments and appeals, and patient and physician surveys. These different approaches generally find quality and patient and physician satisfaction lower in for-profit health plans. Ownership may not be the only factor influencing these scores, since there are substantial regional differences in the ages of plans and lengths of enrollment in the plans. Studies of conversions have found few or no differences before and after conversion.

Community Benefits

One of the major issues in nonprofit to for-profit conversion of health plans has been the potential loss of community benefits. Nonprofit plans have historically provided a wide range of benefits—periodic open enrollment without preexisting condition restrictions, community rating of premiums, innovation in products to provide access to insurance for low-income or vulnerable populations such as children, health services research, and public health education, among others. Some of these, most notably community rating, have come under pressure even without conversion due to competition in the market place due to risk- and age-related premiums and active medical underwriting by for-profit insurers. In the face of growing competition from for-profit insurers and health plans, Blue Cross and other nonprofit plans have been shifting from *social service models*, with their mission

defined by commitment to their communities, to *mutual company models*, where their primary commitment is to their customers. Assessing how much impact conversion has on a company's relationship with its customers, its continuation of activities with community benefits, or its day-to-day business practices requires further research.

Future Implications

This entry began by considering two questions: Why is there substantial nonprofit presence in the hospital, nursing home, and health insurance industries; and how do nonprofit and for-profit entities compare in costs and efficiency, pricing and profitability, quality, and community benefit? With respect to the first question, theory has emphasized issues of asymmetric information encouraging consumers to prefer nonprofits. Historical analysis suggests, however, that lack of functioning markets or the need for a donative business model dominated the early creation of nonprofits and that differential access to alternative sources of capital and effective competition, through mimicry or asymmetric market advantages, provide better explanations of the continued presence in the market of both forms.

Notwithstanding the limited role asymmetric information and consumer fear of exploitation have played in creating nonprofit and for-profit hospitals, there have been active and ongoing debates regarding the desirability of for-profit provision of health services and health insurance, the risk of nonprofit to for-profit conversion, and, on the other side, the justification for continued tax exemption and public benefits for nonprofit providers.

Research continues to fuel this debate. It has shown that while for-profit nursing homes are less expensive and more likely to accept Medicaid patients, their quality is lower than that of nonprofits. Contrary to theoretical expectations, for-profit hospitals appear to be no more efficient or less costly than nonprofits. Quality in for-profit hospitals appears to be comparable with or slightly lower than in nonprofits, and for-profits provide fewer community benefits. Comparisons of nonprofit and for-profit health insurers find no difference in costs, some evidence of lower quality or consumer satisfaction in for-profits, and an

erosion of community benefits as for-profit presence in insurance markets grows.

In the future, research on these issues will likely continue. One area that has only begun to be explored is examining the role of norm setting in markets by comparing the behavior of both for-profits and nonprofits as the mix of the two forms varies across markets.

Jack Needleman

See also Arrow, Kenneth J.; Blue Cross and Blue Shield; Healthcare Effectiveness Data and Information Set (HEDIS); Health Insurance; Hospitals; Nursing Homes; Public Policy; Skilled-Nursing Facilities

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- Catholic Health Association of the United States (CHA):
<http://www.chausa.org>

National Association of Community Health Centers (NACHC): <http://www.nachc.com>

National Committee for Quality Assurance (NCQA):
<http://www.ncqa.org>

FRAUD AND ABUSE

Fraud and abuse in healthcare involve threats to the integrity of reimbursement programs. The most far-reaching laws concerning these practices prohibit illegitimate means of obtaining payment from public programs, most notably Medicare and Medicaid. Similar laws in most states apply in the context of private insurance.

Prosecution of fraud and abuse is the most aggressive area of criminal enforcement in healthcare. More than 2,000 cases are brought each year, netting an estimated \$1 billion in recoveries from violators, although the full extent of improper payments that could be recovered is projected at several times this amount. However, the most significant impact of fraud and abuse enforcement may not be reflected in the sums regained from defendants but rather in the deterrent effect of these prosecutions for the much larger number of potential violators.

Health services researchers study fraud and abuse to better understand the functioning of healthcare reimbursement systems. The availability of funding from a third party to cover the costs of healthcare goods and services creates a temptation for some to use illicit means to obtain it. Without efficient safeguards to deter such behavior, reimbursement mechanisms cannot function. Nevertheless, schemes to game the system short of actual fraud and abuse are common, and they shape many healthcare financial practices. As a result, fraud and abuse laws and enforcement policies are key factors in guiding much of the business structure of healthcare and are essential components of the economics of the industry.

Definition of Terms

The term *fraud and abuse* refers to two kinds of illicit behavior. Fraud is the misrepresentation of material facts to obtain financial gain. For a

representation to constitute fraud, it must both be false and known to be false by the party making it. Common kinds of fraud in healthcare involve claims for reimbursement submitted by providers that either fabricate services that were never rendered or exaggerate the intensity of services that were rendered to obtain a higher level of payment, a practice known as *upcoding*. Since all health insurance, both public and private, requires that goods and services be necessary for medical treatment or diagnosis to be eligible for reimbursement, submission of claims for goods and services that are not necessary can also constitute fraud.

Abuse occurs when providers take advantage of their position of trust to promote inappropriate or unnecessary use of healthcare goods or services. Most commonly, this involves the exchange of payments in return for referring a patient for a product or service. Such payments can take the form of kickbacks, as when a portion of the reimbursement received is sent to the referring provider, or less obvious schemes to bestow a reward indirectly. They are considered illegal and unethical, because the opportunity for financial reward could cloud a referring provider's judgment concerning what is clinically best for the patient.

While payments in return for referring business are forbidden in healthcare, the opposite is true in many other industries. In various contexts, they are not only permitted but actually constitute common practice. For example, real estate agents receive commissions from the sellers of homes in return for arranging sales, as do stock brokers for securities and car salesmen for vehicles. The difference between these businesses and healthcare is that, unlike buyers of homes, stocks, and cars, patients are buffered by insurance from the financial consequences of their purchasing decisions. This removes the incentive to be economically prudent, a situation known as *moral hazard*. The ability of unscrupulous providers to steer patients to purchase unneeded goods and services is thereby enhanced considerably, which creates a risk to payers of overutilization that will escalate costs. Patients also must rely on the expertise of their physicians to determine which goods and services they will obtain to a much greater extent than buyers in other contexts.

Applicable Laws: The Basic Medicare Fraud and Abuse Prohibition

The most important legal directive against fraud and abuse in healthcare is contained in the federal law governing the Medicare and Medicaid programs. It was adopted in its present form in 1977 and amended to permit limited exceptions in 1987. The law contains an extremely broad set of prohibitions that cover a wide range of financial transactions. The section on fraud penalizes anyone who “knowingly and willfully makes or causes to be made any false statement or representation of a material fact” in applying for benefits. The section on abuse applies to anyone who knowingly and willfully either “solicits or receives” or “offers or pays” any remuneration in return for referring a patient for goods or services that are eligible for coverage under Medicare, Medicaid, or similar state programs such as the State Children's Health Insurance Program (SCHIP). The term *remuneration* is defined extremely broadly to include kickbacks, bribes, and rebates that are paid either directly or indirectly, overtly or covertly, in cash or in kind.

The penalties for violations can be severe, as the violations are considered felonies. Criminal sanctions include imprisonment for up to 5 years and fines of up to \$25,000 for each transaction. Short of criminal prosecution, government enforcers can pursue violators in civil proceedings for fines and can seek that they be excluded from participation in Medicare and Medicaid for up to 5 years. For physicians who see a substantial number of geriatric patients, exclusion from Medicare can effectively destroy a medical practice.

Billing fraud under Medicare and Medicaid has generated numerous well-publicized prosecutions. Large corporate hospital chains have paid settlements running into billions of dollars to resolve charges involving practices such as falsifying cost reports, performing unnecessary heart procedures, multiple billing of procedures, and billing for services that never took place. Large pharmaceutical firms have paid similarly large sums for false billing and other deceptive practices. Prosecutions have also netted settlements and convictions against academic medical centers, community hospitals, and individual physicians. Because of the complicated nature of Medicare and Medicaid billing

requirements and the ambiguity of many rules, fraud enforcement can involve highly complex litigation.

The prohibition against abuse raises even more difficult issues in its application. After the U.S. Congress enacted the sweeping law in 1977, the willingness of the courts to apply it strictly remained in doubt. Clarification came in 1985 from the federal Court of Appeals for the Third Circuit in the case of *United States v. Greber*. In that case, a cardiologist accepted referrals of patients from primary-care physicians for diagnostic tests, and he paid the primary-care physicians fees for interpreting the results of the tests. However, the cardiologist acknowledged that one purpose of the fees was to encourage referrals. The court ruled that if any intent behind a payment to a referring physician is illicit, then the entire payment is tainted, even if there is another legitimate purpose. This broad ruling established the precedent that the law against fraud and abuse is to be applied very stringently.

The breadth of the *Greber* decision gave teeth to the statute but left the status of many legitimate arrangements in doubt. There are some situations in which the exchange of funds between referring providers is not only innocuous but actually beneficial to the healthcare system. For example, emergency room physicians are paid salaries by the same hospitals where they admit patients, and staff physicians rent space in hospital-owned office buildings. Literal enforcement of the law to prevent these arrangements would produce absurd results that could severely disadvantage patients. To clarify the status of these and other beneficial business relationships, the U.S. Congress amended the law in 1987 to permit the U.S. Department of Health and Human Services (HHS), which is responsible for administering the Medicare and Medicaid programs, to designate selected practices as immune from prosecution.

Regulations issued by HHS in 1991 in response to the amendment defined 11 *safe harbors*, types of arrangements that are considered safe from enforcement. An additional 12 have since been added to the original list. Among the areas of legitimate activity that fall within safe harbors are employment of referring physicians, rental of office space at fair market value, contracting for professional services at fair market value, investment by referring physicians in large publicly traded corporations that provide medical goods

and services, and investment in smaller entities if stock ownership is not dominated by those who make referrals. Each safe harbor defines in detail the features that place a business relationship above suspicion. Arrangements that contain some but not all features of an applicable safe harbor are not necessarily considered illegal; however, they lose the automatic presumption of legitimacy that strict compliance with the regulations confers.

Applicable Laws: The Stark Amendments

Relying on a perpetrator's intent to find a violation leaves a significant enforcement gap. Some kinds of payments to physicians influence referring decisions even in the absence of a conscious intention to steer patients. These are general compensation schemes that can cement a physician's loyalty even in the absence of a clear ulterior business purpose. For example, physicians who invest in clinical laboratories may be more likely to send patients to those facilities even though the effect of the referral on their investment's value is remote. Along these lines, studies have shown higher rates of referral to radiation therapy clinics by physicians who own stock in them.

To close this perceived gap in the enforcement armamentarium, the U.S. Congress passed two companion amendments to the Medicare law in 1989 and 1993. Formally designated the Ethics in Patient Referrals Act, they are commonly known as the Stark Amendments, after Congressman Fortney "Pete" Stark (D-CA), who sponsored them. Rather than criminalizing specific transactions, this set of laws broadly prohibits Medicare or Medicaid reimbursement when the provider of a service has any kind of financial relationship with a physician who referred the patient or with a member of the physician's immediate family, regardless of the underlying intent.

The relationships to which the Stark Amendments apply include almost any that involve an exchange of economic value, including employment, rentals of space, investments, and loans. However, the law carves out exceptions for arrangements that are considered legitimate, including most of those covered by the safe harbor regulations, and HHS has issued regulations that further clarify the scope of the exceptions. The applicability of the Stark

Amendments is further limited to certain “designated” health services. The original 1989 amendment only concerned referrals to clinical laboratories. The 1993 addition listed nine other kinds of services, including diagnostic radiology, radiation therapy, physical therapy, occupational therapy, and the use of durable medical equipment.

Other Applicable Laws

Fraud in healthcare billing can also be prosecuted under a number of additional statutes that permit prosecutors to request added penalties. The federal False Claims Act imposes civil monetary fines for knowingly making false claims to federal authorities. The mail fraud statute permits prosecution for sending false claims through the mail, and the wire fraud statute does the same for claims submitted electronically. Various criminal laws broadly forbid knowingly representing false information to the federal government. Laws in many states have a similar effect with regard to state health programs, most notably Medicaid. Since private insurance is primarily regulated by the states, state-level laws address fraud in this sphere.

For many healthcare providers, the greatest enforcement threat comes not from the government but from private individuals who act as whistleblowers. Federal legislation enables them to bring civil claims for fraud committed against the government in a type of suit known as a *qui tam* action. Once such an action is filed, government prosecutors may choose to proceed, or they may leave it to the original whistleblower to do so, generally through his or her own attorney. If a claim succeeds, the claimant is entitled to a portion of the recovery equal to 15% to 25% if the government conducts the litigation and 25% to 30% if it is pursued privately. In a large prosecution, this can amount to a substantial sum. *Qui tam* actions represent an ever-present hazard for providers, as they can be initiated not only by members of the public but also by employees and competitors.

Enforcement Agencies

Two federal agencies hold primary authority for enforcing the laws against fraud and abuse. The

Office of Inspector General (OIG) of HHS issues and enforces regulations regarding the integrity of Medicare and Medicaid. It works in conjunction with another component of HHS, the Centers for Medicare and Medicaid Services (CMS), which actually administers these programs. OIG audits healthcare providers, initiates investigations when fraud is suspected, and can impose exclusions from eligibility for reimbursement. It issues regulations to guide compliance, including the safe harbor rules for fraud and abuse and interpretations of exceptions to the Stark Amendments. It also issues advisory opinions on proposed transactions and “fraud alerts” that describe suspect practices for providers to avoid.

The activities of OIG are supplemented by the U.S. Department of Justice (DOJ) when criminal or serious civil penalties are sought. DOJ attorneys also handle appeals of OIG administrative actions in the courts. The agency may initiate investigations and prosecutions through its headquarters in Washington, D.C., or through U.S. attorneys in the department’s regional offices around the country.

Providers that operate on a nonprofit, tax-exempt basis, as do many hospitals, also face fraud and abuse enforcement by the Internal Revenue Service (IRS). To be eligible for recognition of charitable status, the IRS requires that healthcare organizations refrain from letting their activities “inure” to the benefit of private individuals. Payments to induce referrals are considered to represent such private inurement. Hospitals that are found to have engaged in this practice are subject to fines and, in egregious cases, to loss of their tax-exempt status.

Various authorities at the state level enforce the fraud and abuse prohibitions concerning private insurance, Medicaid, and SCHIP. These include the departments of health, welfare, and insurance. State offices of attorneys general usually play the role of the DOJ when enforcement actions reach the courts.

Future Implications

The presence of fraud and abuse in healthcare stems from the large amount of money that is available through public and private insurance to reimburse services. This money creates a temptation for

unscrupulous providers and patients to try to obtain more than a legitimate share. Because of the complicated nature of healthcare services and of the procedures through which they are billed, the legal directives that forbid fraud and abuse and the processes through which these directives are enforced are marked by complexity and changing interpretations.

The incentive to overbill exists primarily within insurance arrangements that reimburse providers on a fee-for-service basis—that is, with a discrete payment for each healthcare service rendered. Some alternative mechanisms avoid this inducement, most notably capitation under managed care, in which a provider is paid the same amount for each patient regardless of the quantity of services that are actually provided. Under such arrangements, overtreatment, inflation of bills, and payments for referrals no longer generate financial returns. If this kind of reimbursement paradigm spreads further, fraud and abuse enforcement in its traditional form may fade in importance. However, it may be replaced with an opposite concern, that of undertreatment, and with it, new challenges for policymakers and government agencies.

Fraud and abuse enforcement policy, therefore, can be seen to reflect the underlying economic dynamics of the healthcare industry. As the industry's structure evolves, legal doctrines will, as well. The resulting interplay presents health services researchers with opportunities to better understand the relationships between financial incentives, healthcare business practices, and policy responses.

Robert I. Field

See also Antitrust Law; Centers for Medicare and Medicaid Services (CMS); Medicaid; Medicare; Moral Hazard; Regulation; State Children's Health Insurance Program (CHIP)

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- U.S. Government Accountability Office (GAO): <http://www.gao.gov>

FREE CLINICS

Free clinics are community-based entities that provide healthcare services mostly to uninsured people at little or no cost to their patients. Free clinics are organized as private, nonprofit organizations (or programmatic components of nonprofit organizations). They are run by volunteer, licensed healthcare professionals who deliver basic medical services, but the clinics often have a small paid staff to support their volunteer infrastructure. Free

clinics tend to be located in permanent stand-alone facilities or mobile units or housed in borrowed or rented spaces, such as church basements or homeless shelters. They may be independent entities or part of or affiliated with another nonprofit organization (e.g., church, hospital, or social service agency). Free clinics also are supported mostly by private sources of funding.

History

The American Medical Association (AMA) shunned the free-clinic movement of the 1960s, the era when the number of free clinics grew rapidly. Since 1994, however, official AMA policy has supported free clinics. Free clinics are now a preferred model that private physicians adopt to provide care for the growing numbers of uninsured and underserved individuals. In the mid-1990s, the Robert Wood Johnson Foundation (RWJF) funded 40 projects through a \$12 million initiative to encourage private physicians to improve access to care for the uninsured and underinsured. Under this RWJF grant program, physicians in nearly one of every three projects chose a free-clinic model as a method to improve access to healthcare. Free clinics may have emerged initially to treat “outsiders” (e.g., drug addicts and runaway youth), as exemplified by the Haight Ashbury Free Clinics in San Francisco, a free medical clinic situated at the epicenter of the 1960s hippie movement, founded to serve patient populations who identified with the counterculture. However, many free clinics now serve less marginalized segments of the population, such as low-income individuals who cannot afford health insurance, and underinsured patients. Many free clinics today target their services to the so-called working poor. Thus, in the past 40-plus years, free clinics have redefined “needy” to include the medically indigent or underserved, a much broader spectrum of patients than in the past.

Over the years, the number of free clinics in the nation has grown exponentially, from 59 in the 1960s to more than 1,000 in the 2000s. However, their precise number is unknown. Free clinics are found in every state except Alaska. The number of free clinics in the states varies widely, from 1 free clinic each in Delaware, Hawaii, and Rhode Island to more than 70 free clinics in North Carolina.

Research

Despite their long history and broad geographic distribution, free clinics have received little attention from health services researchers, largely due to a dearth of publicly available data and a lack of consensus about what constitutes a free clinic. Notably, the national Institute of Medicine’s (IOM) seminal study on the nation’s safety net *America’s Health Care Safety Net: Endangered but Intact* (2000) does not even mention free clinics. Consequently, there is very little understanding about the roles that free clinics play in the nation’s ambulatory healthcare safety net.

The Uninsured and the Ambulatory-Care Safety Net

It is estimated that 47 million persons in the United States have no health insurance coverage. It is widely reported that uninsured individuals delay or forgo needed or preventive healthcare often because the cost of obtaining care is prohibitive. Free clinics are one choice among a range of other choices—including private physicians, federally qualified health centers (FQHCs), public clinics, hospital outpatient departments, academic medical centers, and hospital emergency rooms—that uninsured patients have when seeking a source of primary care. Except for free clinics, most sources of care for uninsured patients require (often substantial) cost sharing from patients. In most ambulatory-care settings, uninsured patients are charged a flat fee or an amount according to a sliding fee scale based on a family’s income. Ambulatory providers also generally bill patients. In contrast, free clinics distinguish themselves from these other primary-care providers by offering their care for free or for a nominal fee and by not billing patients. Free clinics are, therefore, one of the few viable options available to uninsured patients with limited funds.

Free Clinics Versus Federally Qualified Health Centers

To appreciate the niche that free clinics fill in the ambulatory care safety net, it is illustrative to compare free clinics with FQHCs, because they are most analogous to (and often confused with)

free clinics. Free clinics have essential features that distinguish them from these health centers.

Specifically, free clinics annually raise \$300 million in private funds to serve an estimated 3.5 million uninsured and underinsured patients, according to the National Association of Free Clinics. In 2006, the \$1.8 billion federal health center program supported roughly 1,000 health center grantees, which accounted for approximately 4,000 sites. Collectively, these health centers served 15 million patients, of whom 6 million were uninsured.

Free clinics seek to serve the uninsured. Many only see patients who are uninsured. In contrast, approximately 40% of health center patients are uninsured; the majority of patients are insured, principally by Medicaid.

Free clinics target the working poor. Many target patients who are unlikely to qualify for public health insurance programs. Often these patients have incomes between 100% and 200% of the federal poverty level. In contrast, health centers serve mostly poor patients who qualify for Medicaid.

Reportedly, free clinics do not charge patients based on their ability to pay. By comparison, health centers are required to use a sliding fee scale based on a patient's income and family size. The amount of the sliding fee scale is set by each clinic and varies widely but ranges from \$20 to about \$100.

Free clinics provide a limited range of health-care services on-site. They deliver free services on-site as well as make arrangements for patients to receive free care from formal networks of referral providers. Most free clinics provide services such as physical examinations, urgent/acute care, chronic disease management, medications, and health education on-site. Often services are available through a referral arrangement. By comparison, health centers are required to provide comprehensive primary-care services. The scope of services is specified by law and in regulations.

Most free clinics are not open full-time. Furthermore, their patients generally cannot contact a clinic provider after-hours, when the clinic is closed. In contrast, health centers are generally open full-time. Furthermore, they are expected to ensure telephone access to another health center or community provider when the clinic is closed and to have procedures in place for patients who need care to be seen.

Reportedly, free clinics do not bill patients for services. In contrast, as part of their mandate to maximize revenue from all sources, including patients who are uninsured/self-pay, health centers routinely bill patients for services.

Free clinics tend to rely mostly on private sources of funding for their operating budget. Most of the clinics receive no revenues (or very little) from government sources. By comparison, health centers receive the majority of their funding from government sources. Federal appropriations to health centers account for approximately one fifth of a health center's revenues, and Medicaid accounts for more than one third. Very few free clinics bill for third-party reimbursement from insurers.

Last, free clinics rely on volunteer, licensed health-care professionals to deliver services. A small paid staff often supports their volunteer infrastructure. In contrast, the core clinical staff members operating in health centers are paid, full-time employees.

Heterogeneity of Free Clinics

A commonly repeated saying in the free-clinic sector—"If you've seen one free clinic, you've seen one free clinic"—aptly describes the great variety of clinics that comprise the population of free clinics. Free clinics span a continuum from those that see a limited number of walk-in patients one night per week to others that provide comprehensive primary care services to thousands of patients annually with the support of full-time, paid staff and a multimillion-dollar operating budget. The considerable diversity in the free-clinic model makes it difficult to draw conclusions about the adequacy of individual free clinics to meet the needs of uninsured patients. The differences seen across free clinics suggest that the merits of these clinics must be evaluated on a case-by-case basis.

Current and Future Trends

Having existed for many decades but remaining fairly invisible, free clinics today are garnering more attention as they become more formalized. The National Association of Free Clinics, a membership organization representing free clinics, was established in 2001. State and regional free-clinic

associations predate the national association. The 24 state and regional free-clinic associations today encompass 33 states. Twenty-two states operate their own free-clinic associations. The first state association, the Virginia Association of Free Clinics, was founded in 1993. Signifying the progress toward standardization, the free-clinic association in Virginia has developed a process to certify free clinics. Virginia's certification process has been replicated, in part, by Ohio.

Free clinics' visibility also is enhanced by their increasing participation in government programs. Historically, free clinics have eschewed government involvement, and today most free clinics do not receive any funding from government sources. But in response to the Health Insurance Portability and Accountability Act of 1996 (HIPAA), which extends federal medical malpractice coverage to volunteer healthcare professionals at free clinics, more than 2,000 health professionals at 73 sponsoring free clinics have been deemed eligible for medical malpractice protection under the Federal Tort Claims Act (FTCA) as of 2007. To be eligible for FTCA coverage, free clinics must maintain a risk management system and providers must meet privileging and certification requirements. These requirements introduce bureaucratic red tape, which free clinics historically have shunned.

These recent developments suggest that the free clinics of the future may be different in important ways from those of the past. Continued monitoring of free clinics is needed to account for the changing healthcare environment and its impact on the free-clinic sector.

Julie S. Darnell

See also Access to Healthcare; American Medical Association (AMA); Federally Qualified Health Centers (FQHC); Health Insurance Portability and Accountability Act of 1996 (HIPAA); Primary Care; Robert Wood Johnson Foundation (RWJF); Safety Net; Uninsured Individuals

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FUCHS, VICTOR R.

Victor R. Fuchs is a leading health economist who is perhaps best known for his work *Who Shall Live? Health, Economics, and Social Choice*, which provides healthcare professionals and policymakers with the tools to understand the economic and policy problems in healthcare that have emerged in recent decades. Fuchs is the Henry J. Kaiser, Jr., Professor Emeritus at Stanford University, senior fellow in the Freeman Spogli Institute for International Studies, and a core faculty member in the Center for Health Policy/Primary Care and

Outcomes Research at Stanford. Fuchs is also a research associate of the National Bureau of Economic Research (NBER).

Fuchs received his bachelor of science degree in business administration from New York University and a master's and a doctoral degree in economics from Columbia University. Fuchs began his professional career as a faculty member at Columbia University and New York University. He later was a program associate for the Ford Foundation Program in Economic Development and Administration, scholar-in-residence at the Rockefeller Foundation in Lake Como, Italy, and fellow at the Center for Advanced Study in the Behavioral Sciences in Stanford, California. In 1968, Fuchs joined the faculty at the Mount Sinai School of Medicine as professor of community medicine and the City University of New York Graduate Center as professor of economics and served as vice president of the National Bureau of Economic Research (NBER). In 1974, he accepted a position at Stanford University, where he continues to teach and conduct research.

Fuchs's work involves applying economic analysis to solve social problems of national concern, with an emphasis on health and medical care. He has been particularly interested in the influence of financial incentives on physician behavior and its relation to healthcare expenditures. He has published extensively on topics such as the cost of medical care and the determinants of health, with particular focus on the role of socioeconomic factors. His scholarly work has resulted in 15 books and more than 180 articles and papers.

Fuchs's contributions have been recognized through many awards and honors, including the John R. Commons Award from the Omicron Delta Epsilon, the Emily Mumford Medal for Distinguished Contributions to Social Science in Medicine from Columbia University, the Distinguished Investigator Award from the Association for Health Services Research, the Baxter Foundation Health Services Research Prize, and the Madden Distinguished Alumni Award from New York

University. He is also a past president and distinguished fellow of the American Economic Association and holds elected memberships or fellowships in the American Philosophical Society, the American Academy of Arts and Sciences, and the National Academy of Sciences, Institute of Medicine (IOM).

His current research examines the attitudes and beliefs in public support for national health insurance. He is developing a proposal for a universal healthcare voucher system in which all individuals would receive a government voucher that would guarantee coverage in a private health plan with standardized benefits.

Renardis Banks

See also Cost of Healthcare; Health Economics; National Health Insurance; Pay-for-Performance; Payment Mechanisms; Physicians; U.S. National Health Expenditures

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- Stanford Center for Health Policy/Center for Primary Care and Outcomes Research: <http://healthpolicy.stanford.edu/people/victorrfuchs>



GATES FOUNDATION

The Bill and Melinda Gates Foundation is the largest private philanthropic foundation in the world. With assets in excess of \$38.9 billion in 2007, the foundation focuses its grant-making and advocacy efforts on eliminating global inequities and increasing opportunities for those in need. In 2007, it contributed more than \$1.5 billion to programs that addressed global agricultural and economic development, medical research and public health initiatives in developing countries, and the improvement of education and access to information in the United States.

Background

Bill Gates, Microsoft's cofounder, and his wife, Melinda, established the William H. Gates Foundation in 1994, which focused its charitable giving on advancing global health and the community of the Pacific Northwest. Gates's father, William, managed the activities of this entity. Three years later, the Gates Library Foundation was created, which aimed at improving access to public libraries for low-income families in North America. It was later renamed the Gates Learning Foundation to reflect its expansion into broader education efforts.

The Bill and Melinda Gates Foundation was established in 2000 through the merger of the two Gates foundations. The original priority

programs for this new entity were global health, education, libraries, and the Pacific Northwest. In 2006, the foundation reorganized, focusing its giving on three areas: global development, global health, and the United States. The same year, the investor and philanthropist Warren Buffett made a lifetime pledge to the foundation of Berkshire Hathaway stock, valued at \$31 billion. At this time, the foundation also changed its structure, creating the Bill and Melinda Gates Foundation Trust to manage and invest the endowment assets. The foundation is based in Seattle, Washington, with offices in Washington, D.C., and Beijing, China.

Program Areas

Since 2006, the Bill and Melinda Gates Foundation has focused on three main program areas: the Global Development program, the United States program, and the Global Health program. These programs all strive to accomplish the foundation's mission to increase equity and opportunity to those populations that are most in need.

Global Development

The Global Development program, the newest of the foundation's programs, strives to eliminate extreme poverty and hunger. In its 1st year, the program's grant-making activities totaled \$170,304,000, and in 2007, the foundation paid \$308,041,000 in grants in this area.

Through strategic partnerships and grant-making activities in its agricultural development initiative, the program helps increase opportunities for farmers in developing countries, as well as researching the production of rice and flour enriched with micronutrients. The Global Development program also has an initiative aimed at increasing financial services to the poor; it funds projects that examine the effectiveness of loans, insurance, financial planning, and financial education in impoverished countries.

In addition to these two key initiatives, the Global Development program is committed to global libraries, supporting public libraries and organizations that work to increase access to information technology. Finally, the program's Global Special Initiatives awards grants to organizations that research issues of concern to the developing world, including water, sanitation, and hygiene.

United States Program

The United States program is dedicated to reducing inequities that exist in this country for low-income, minority, and vulnerable populations. The program also aims to increase opportunities for these populations. In 2007, the program paid a total of \$483,626,000 in grants.

The United States program houses the foundation's education initiative, which focuses on keeping young students from dropping out of school and better preparing high school graduates for college. This program also oversees the activities of the public libraries initiative, which strives to provide access to computers and the Internet at local public libraries; this initiative also aims to keep technology systems up-to-date for libraries and provide adequate training and support for this technology. Showing a continued commitment to the foundation's immediate community, the Pacific Northwest initiative addresses the issues of inequity and opportunity for families and children living in Washington and Oregon. This initiative's activities include supporting projects that work with at-risk youth and helping to reduce homelessness among families in the region.

Beyond these three initiatives, the United States program also includes activities for special initiatives that identify needs that fall outside the

program's established purview. These activities help shape potentially new directions for the program. The program also handles advocacy for the foundation's efforts in this country.

Global Health

The Global Health program is the largest of the Bill and Melinda Gates Foundation programs. It is committed to addressing the high mortality and morbidity rates from preventable diseases in developing countries; it focuses on funding to projects that would increase access to existing vaccines and treatments for common diseases and researching new, affordable, and practical health solutions. In 2007, the program paid \$1,220,008,000 in grants in this area.

Projects funded by the Global Health program address prevention and treatment of diseases that meet three criteria: (1) they cause widespread illness and death in developing countries, (2) they represent the greatest inequities in health between developed and developing countries, and (3) they receive inadequate attention and funding. The foundation's priority diseases and conditions are acute diarrheal disease, acute lower-respiratory infections, child health, HIV/AIDS, malaria, poor nutrition, reproductive and maternal health, tuberculosis, vaccine-preventable diseases, and other infectious diseases.

Also through the Global Health program, the breakthrough science initiative funds projects that advance health research and technologies in the developing world. This initiative supports the development of affordable and accurate medical tools. The foundation's Grand Challenges in Global Health is part of this initiative.

In addition to the disease-specific and special initiatives, the program also handles the foundation's global health advocacy efforts and global health interventions at the local community level and provides immediate support for natural disaster and emergency relief.

Future Implications

As the world's largest private foundation, the Bill and Melinda Gates Foundation is poised to make a major impact in the areas of global policy, global health, education, and access to information

technology. Since 2006, when the Bill and Melinda Gates Foundation Trust was established, the pledge from Warren Buffett was received, and the announcement was made that the charity has a set lifespan of 50 years after the deaths of its founders, the foundation has developed a strategic outlook to maximize its charitable giving. Because of criticism of its investment practices—namely, that several corporations in the foundation's portfolio are not environmentally and socially conscious and may contribute to global development and health problems, the foundation is currently reassessing its investment practices.

In July 2008, Bill Gates stepped down from his position at Microsoft to devote his efforts full-time to the Bill and Melinda Gates Foundation. With this change, the foundation may identify additional priority areas or increase its activities.

Kathryn Langley

See also Computers; Ethnic and Racial Barriers to Healthcare; Health Disparities; Infectious Diseases; Preventive Care; Public Health; Vulnerable Populations

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Bill and Melinda Gates Foundation:
<http://www.gatesfoundation.org>

GENERAL HEALTH QUESTIONNAIRE

The General Health Questionnaire (GHQ) was developed to assess the extent of psychiatric illness in general practice. Contrary to what the name suggests, this questionnaire does not assess general health but mental health. The GHQ is

considered to be a significant advancement in psychiatric epidemiology since general practitioners did not diagnose their patients with significant psychiatric illness in the 1970s. Recognizing the need for physicians to test and assess their patients and make a tentative diagnosis of mental illness, David Goldberg at the Institute of Psychiatry, London, developed and published the GHQ.

Overview

The GHQ was designed as a self-administered screening instrument with the ability to differentiate psychiatric patients from healthy individuals within a community. However, the GHQ is not concerned with making a specific psychiatric diagnosis. The GHQ was originally developed as a 60-item instrument. Currently, there are four shortened versions available. In addition, the GHQ has been translated into 38 languages, and it has been extensively used in both research and clinical practice. Furthermore, this survey instrument has been validated cross-culturally in many adult populations across the world.

Rating Scale

Each item on the GHQ is rated on a 4-point scale: *less than usual*, *no more than usual*, *rather more than usual*, or *much more than usual*. For example, the GHQ-12 gives a total score of 36 or 12 based on the selected scoring methods. One of the most common scoring methods used is the bimodal method, where the responses are assigned the numeric values of 0-0-1-1. Another method is the Likert scoring style, which assigns the values as 0-1-2-3.

The areas of mental health that are assessed by the original version of the GHQ include depression and anxiety, social functioning, psychophysiologic symptoms, general health, and vague aches and pains. The internal consistency of the GHQ is reported to be in the range of 80% to 90%, which indicates the high reliability of the instrument. Additionally, the coefficients of correlation with global clinical assessments of psychopathology are in the range of .55 to .83, indicating high validity. The overall sensitivity has been reported to be about 68% with a specificity of about 81%.

Factors Assessed

The GHQ assessment focuses on breaks in normal functioning rather than lifelong traits. The GHQ is based on two major classes of phenomenon that occur in patients with psychiatric illness. First, it assumes that patients with psychiatric illness are not able to carry out normal healthy functions. Furthermore, it assumes that such patients have episodes of distress. The items in the GHQ concentrate on the specific spectrum between psychiatric disturbance and normal functioning, rather than ranging over the whole array of mental health from normality to severe disturbance. Respondents are not asked how long they have experienced symptoms. As a result, disorders with less than 2 weeks' duration are included. In contrast, the *Diagnostic and Statistical Manual of Mental Disorders (DSM-IV)*, another diagnostic instrument for assessing the severity of depression requires that symptoms be present in a respondent for at least 2 weeks to be included as a positive symptom of depression. Certain demographic variables also affect the GHQ scores, while some do not. For example, females who are divorced or separated, unemployed, or living in urban areas generally have higher scores than women who are not in the same situation. Age and social class, however, do not have a strong effect on the GHQ score.

Versions

Several versions of the GHQ are available. These include the GHQ-60, the fully detailed 60-item questionnaire; the GHQ-30, a short form without items relating to physical illness; the GHQ-28, a 28-item scaled version that assesses somatic symptoms, anxiety, insomnia, social dysfunction, and severe depression; and the GHQ-12, a quick, reliable, and sensitive short form, which is ideal for research studies.

In terms of validity, reliability, and prediction, the 60-item version has been shown to outperform the shorter counterparts. The 12-item and the 30-item versions have been more widely used in community samples because they are brief and take less time to complete. Over the past 10 years, the GHQ-28 has become a widely used questionnaire in epidemiological studies.

The GHQ has also been adapted for different populations and cultures. There are three main reasons that account for the interest in adapting this instrument to different samples and languages. First, the GHQ-28 has the advantage of being shorter, with approximately 3 to 5 minutes required for the full questionnaire to be filled out. Additionally, it can be applied to primary-care settings, where the majority of minor psychiatric disorders arise. Furthermore, apart from providing an overall assessment, the GHQ-28 contains four scales that furnish additional information.

Use

The GHQ has been used in different settings for various purposes, including within clinical-practice settings for research studies and clinical trials and in population-based epidemiological studies. The use of GHQ and its versions is protected by copyrights held by David Goldberg and the Institute of Psychiatry, London. The GL Assessment acts on behalf of the original copyright holders, and it allows researchers to use the GHQ after paying user fees and signing various legal agreements. Based on the study design and the context of use, there is also a provision to use GHQ free of cost.

Future Implications

The GHQ has been used to assess the mental health status of individuals and populations for more than three decades. The GHQ has also been translated and validated across many languages and cultures. A general note of caution should be exercised in using the GHQ or in interpreting the results from this survey in the clinic setting, because it does not differentiate between different types of mental illness. Among all the different versions of the GHQ, the 12-item short form remains a quick, reliable, and sensitive questionnaire, making it ideal for research studies. In addition, it has been shown that the use of GHQ by general practitioners can increase their ability to recognize hidden psychiatric morbidity and a new episode of illness.

Vikrant Vats

See also *Diagnostic and Statistical Manual of Mental Disorders (DSM)*; Health Surveys; Measurement in Health Services Research; Mental Health; Mental Health Epidemiology; Short-Form Health Surveys (SF-36, -12, -8)

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- National Institute of Mental Health (NIMH):
<http://www.nimh.nih.gov>

GENERAL PRACTICE

General practice, also known as family practice or family medicine, and more recently termed *primary care*, is the field of medicine dedicated to caring for people of all ages. The principles and philosophy of general practice include establishing

a long-term relationship with patients; providing patient-centered, comprehensive and cost-effective care; and identifying and addressing the family and psychosocial factors that affects the health and wellness of patients. A general practitioner (GP) is a physician who practices family medicine and provides primary care to patients to treat acute and chronic illnesses, as well as providing routine preventive care and health education.

Overview

With a mission to preserve and promote the science and art of family medicine and to ensure high-quality, cost-effective healthcare for patients of all ages, the American Academy of Family Practice (AAFP) was founded in 1947. Family practice was officially recognized in February 1969 as the 20th primary medical specialty. With this new designation came added responsibility. Training and preparation for family practitioners was standardized to include a wide variety of medical disciplines, including general internal medicine, women's health and obstetrics, infectious disease, pediatrics, newborn care, emergency medicine, surgery and its subspecialties, ophthalmology, dermatology, otolaryngology, and more. Office-based training of the fledgling family practice physician became a high priority to maintain wellness and decrease rising hospitalization rates. Recently, family practice training programs have collaborated within their respective communities and academic institutions to offer more hospital-based care to their patient populations, ensuring greater continuity of care for the patients. This programmatic philosophy for more hands-on experience with inpatient care instead of training in outpatient care has been necessary because of the increasing fragmentation of the healthcare system in the United States and the rising costs associated with healthcare.

Family and general practitioners are often the first point of contact for people seeking healthcare, and these providers generally act as the traditional family physician. In general practice, a wide range of medical services is typically available, including newborn and well-child care, age-appropriate vaccinations, and care of the sick child as needed. Adolescent and young-adult care, along with

appropriate counseling tailored to this formative period in life, completes the care of children as they progress into adulthood. Most physicians in general practice also offer care to women of child-bearing age, which includes services during pre-conception and pregnancy as well as care of the newborn. Additionally, one quarter of general practitioners have incorporated obstetrical care into their practices, which involves the delivery of the newborn and immediate care of the mother following the birth. Mainstream adult care of people 25 years of age and above, along with care of the elderly, is the main purview of physicians in general practice. Comprehensive physical exams, screening tests, treatment of common and acute conditions, management of chronic disease, coordination of allied healthcare, and even home care are all a part of the routine health maintenance functions that form a common thread in general practice.

The strength of general practice lies in the relationships forged between the patient and the physician. This bond allows the patient to feel comfortable revealing confidential, discreet problems of both physical and psychological origin. This type of relationship most often helps identify medical and health concerns in their early stages, which reliably leads to a satisfactory resolution of the issue or a timely referral to specialty services if necessary. Communication between the patient and the physician and between the physician and other healthcare providers is the key to successful general practice of medicine.

The advantages of family practice and general practitioners lie in their ability to help decrease the financial burden faced by every U.S. resident. Nations that have an adequate supply of family practice physicians and general practitioners experience significant financial rewards and lower costs of healthcare. General practice is traditional medical care that is not only the most cost-effective in comparison with other medical fields but also associated with better health outcomes. Twenty-eight nations, including Cuba, New Zealand, and most of the European countries, had lower infant mortality rates than the United States. The United States also ranks fairly low in terms of overall life expectancy and has a relatively high incidence of chronic disease. Compared with other nations

such as Canada, which has a higher percentage of medical students who enter training programs in primary care, the United States spends much more on healthcare. By investing in the training and retention of general practitioners and the promotion of this field, the United States may be able to improve health outcomes and decrease health expenditures.

With the rise in medical specialties and subspecialties and financial incentives that encourage medical specialization, the number of general-practice physicians in the United States has been declining in recent years. The Bureau of Labor Statistics (BLS) estimates that about 40% of physicians are primary-care providers; however, family and general practitioners represent just over 12% of this group.

Future Implications

General practitioners play a pivotal role in the healthcare system as the primary deliverers of care. The need for general practitioners of family medicine will continue to grow as the population ages and there is a greater emphasis on preventive healthcare. Public policies that encourage increasing the number of providers of general practice are needed to address the current shortage and to ensure adequate access to healthcare for everyone.

Samuel N. Grief

See also Access to Healthcare; Acute and Chronic Diseases; American Academy of Family Physicians (AAFP); Cost of Healthcare; Physicians; Primary Care; Primary-Care Case Management (PCCM); Primary-Care Physicians

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- American Board of Family Medicine (ABFM):
<http://www.theabfm.org>

GENETICS

Genetics is the study of the life blueprint (commonly referred to as DNA) that makes up the genes (the fundamental units of heredity), which are found in the human chromosomes. In total, there are 23 pairs of chromosomes that make up the human genome (the total package of heredity information). Human molecular genetics focuses, among other things, on discovering and understanding the inventory of human genes; their functions; the effects of variation in their distributions among different individuals; their roles in the etiology of human diseases; and how such knowledge can be used to improve the prevention, diagnosis, and treatment of human diseases.

Substantial progress has been made in the field of molecular genetics in the past several decades, and

this has translated into better prediction, diagnosis, and drug development and hence better treatment of many diseases, especially monogenic disorders such as hemophilia, cystic fibrosis, fragile X syndrome, and Huntington's disease. Unfortunately, similar medical advances remain to be seen in relation to the genetic etiology of most common human diseases, such as hypertension, diabetes, cancer, and age-related macular degeneration. As populations age, the relative burden of these conditions has generally been on the rise.

Several reasons can be given to explain this situation in which current technology-driven advances in molecular genetics have not proven to be conceptual breakthroughs. In particular, population and clinical scientists have not done enough to assess the utility of the new advances in molecular technology. The key challenge in genetics at this time is to translate the information from genotyping and sequencing studies into clinically relevant tools.

Developing an Evaluation Framework

To accurately evaluate the impact of molecular genetics on common diseases, appropriate criteria to assess the contribution to treatment and prevention must first be available. Key elements of such an evaluation framework must provide answers to questions such as the following: How do the answers provided by this new research fit with what researchers already know? Can molecular tests provide new information about prediction or risk stratification? Will it help to tailor therapy? And will it yield insights into pathogenesis and/or pathways? Answers to these and related evaluation questions will have to be provided by data from the different but dependent stages of molecular genetic research, from discovery to application, as illustrated in Figure 1.

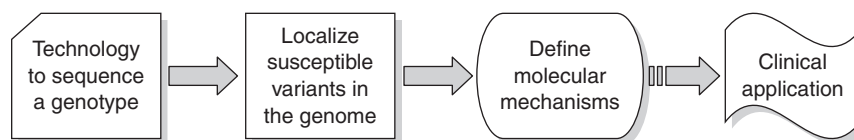


Figure 1 Schematic of Stages in Molecular Genetic Research

A pertinent question therefore becomes, What will the payoff be from finding disease susceptibility variants or loci? The first most likely outcome is improved prediction and/or risk stratification. Experience so far suggests that prediction is an unlikely use of the knowledge of susceptibility loci. To be useful for diagnosis or risk stratification, such a genetic test must substantially increase the posttest probability and also provide supplemental and independent information beyond currently available tests. Based on the assumption that individuals known to be at high risk of developing a disease will benefit from earlier, more intensive intervention, either through lifestyle changes or drugs, risk stratification could also be an important use of the knowledge of disease susceptibility loci. However, in a situation where both exposure and susceptibility are widespread, population-wide measures are often the most effective public health strategy (e.g., smoking, high cholesterol). Likewise, measurement of the phenotype (e.g., high blood pressure) is likely to provide more information than the genotype.

Personalized Medicine

Another area where identification of susceptibility variants will potentially be of benefit to public health is tailored therapy. There are many neutral variants in the human genome that have survived evolutionary selection and are now known to alter drug metabolism or response. These variants could therefore be responsible for the large individual variation in toxicity as well as any therapeutic effect. This background variation constitutes the potential basis for tailored therapy (sometimes referred to as personalized medicine).

In addition, it is argued that in many instances susceptibility genes will mimic pathogenesis. Under this assumption, a description of the genetic basis for chronic illness will lead to a better understanding of disease processes, including new physiologic pathways that will create new opportunities for interventions through prevention or drugs. These payoffs are, however, contingent on a thorough understanding of the biology since genetic markers cannot unravel pathways. It is important to note that knowledge of pathways or mechanisms is only useful to public health if it leads to modifiable exposures or drugs.

These proposed valuable outcomes from genetic research must be evaluated in light of the current experience. In fact, up to this point, knowing the genotype has generally not been a useful guide to therapy, even for monogenic disorders including long QT syndrome, Marfan syndrome, Factor V Leiden—venous thrombosis, and hereditary hemochromatosis. The challenge remains to narrow the gap between the vision of personalized medicine and reality. This will involve making realistic estimates of the precision of individual prediction, revisiting the trade-offs of the high-risk versus population strategy in the context of how genetic screening will be used for common diseases, describing and experimentally verifying the procedures to move from anonymous genetic markers to causal variants, and describing how knowledge of pathways and mechanisms will open new preventive and therapeutic options. All these research efforts will entail potential costs. These costs could include diversion of resources within the scientific research community away from preventive interventions that already work, fostering the impression that technology will solve social problems, and a rekindling of the debate over biological determinism and racial/ethnic health disparities. However, the seduction of even larger genetic studies appears poised to cause the diversion of already declining resources in the foreseeable future.

Future Implications

Based on these considerations, molecular medicine's role is likely to remain marginal in the control of common diseases in the foreseeable future. At the same time, it is likely that a whole new dimension of biology will be learned, and this will in some instances illuminate causal processes. In some cases, prediction will be sufficiently precise. Some drug discovery will be possible, and this should have a positive impact on the ability to deliver more effective healthcare. However, there is a need for balanced and unbiased expectations of the future contribution of genetics to medicine and public health, knowing that molecular medicine relies heavily on unproven assumptions of the potential for technology to solve health problems. Some researchers argue that genomics may hold the potential to advance the claims of a science

belief system, over the pragmatic needs of the long-term movement, toward prevention through the creation of a healthier environment as the most effective means to control common diseases.

Richard S. Cooper and Bamidele O. Tayo

See also Disease; Epidemiology; Evidence-Based Medicine (EBM); Forces Changing Healthcare; Public Health; Risk; Technology Assessment

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<http://www.genome.gov>
- National Library of Medicine (NLM), Genetics Home Reference: <http://www.ghr.nlm.nih.gov>
- National Office of Public Health Genomics:
<http://www.cdc.gov/genomics>

GEOGRAPHIC BARRIERS TO HEALTHCARE

Access to care can be defined as the timely use of personal health services to achieve the best possible health outcomes. Equitable access to healthcare is directly linked to the quality of life of populations. Healthcare access and outcomes

have a linear relationship relative to structural, financial, personal, and geographic barriers. Major geographic barriers to healthcare access include the following: shortage of healthcare service providers, clinics, and/or hospitals in the vicinity of a community; increased travel time to the nearest facility or provider; lack of transportation—slow, erratic or nonexistent public transportation systems; residing in public housing or mountainous, rural, snowbound, or disaster areas; physical inability to access facilities due to disability; seasonal barriers, such as excessive rainfall or snow; and poor or nonexistent road systems.

The main tenet of preventive care is that regular access to primary medical care reduces the need for acute care. Geographic barriers to care have adverse implications both before and after an individual enters the realm of healthcare delivery, which can lead to considerable health disparities. Geographic access is typically characterized as a measure of distance to care, with 30 minutes generally being viewed as the accepted maximum time to access healthcare. Access is influenced by the area of an individual's activity space; the spatial distribution of healthcare facilities; and the spatial structures, such as mountains, lakes, and rivers, that act as barriers. Distance can be measured from two different perspectives. It can be considered from the perspective of the suppliers, who look at the distance to healthcare facilities. It also can be viewed by the individuals, who determine how to obtain the services and how far to travel to receive healthcare. A number of methods are used to calculate distance, such as the linear distance across a map, road distance, travel time, perceived distance, perceived travel time, and the distance to the nearest provider. Calculating distance alone, however, does not take into account the variation in individual mobility, preferences, and spatial habits; differences in road and travel conditions; and subjective perceptions of distance—for example, younger people may be more comfortable traveling longer distances than the elderly, sick, or handicapped.

Healthcare utilization is frequently related to travel time and distance. Research has shown that long travel time due to poor transportation to or due to long distance from facilities decreases utilization. People tend to forgo preventive, acute, and chronic care when travel is cumbersome and costly and when facilities are far away, which is common

in rural areas worldwide. This distance decay effect has been well established, as increasingly smaller proportions of populations are using services at greater distances from them. The extent of distance decay depends on the type and severity of illness.

Healthcare Geography

A community's geographic location has important implications for personal healthcare and healthcare service delivery. Human geography focuses on the patterns and processes that shape human interaction with various environments and how they adapt to it. Medical geography studies the correlation between disease and disease diffusion, without explicitly considering the other aspects of human interaction. Together, human and medical geography span the structure of health services and explain how people use health services in ways that reflect and create disparities. In the context of healthcare, economic geography focuses on the location of healthcare facilities and on transportation and trade. Remote and rural areas still suffer from inadequate healthcare infrastructure and personnel; they are also lacking in public transportation systems. Using geographic mapping to set boundaries with relation to healthcare delivery and outcomes and to compare different regions is increasingly being accepted in health policy formulation and resource allotment. Geospatial mapping is now a common approach for governments to assess the availability of healthcare providers and infrastructure in relation to adjacent communities, to identify geographic barriers to care, and to institute remedial measures. However, a universally acceptable, fundamental unit of geography for measuring health and healthcare has yet to be defined.

Geographic Maldistribution of Healthcare Providers

The phenomenon of physicians and associated healthcare professionals choosing to practice in affluent, urban communities is a recognized global trend. It is referred to as the maldistribution of healthcare providers. This ongoing trend creates a shortage of healthcare providers in remote, rural,

and inner-city areas and a surplus in urban and suburban areas. Despite an increase in the overall physician-to-population ratio, this disproportionate distribution continues. The smallest and most geographically remote communities experience the greatest shortages, though almost all rural communities have comparatively fewer physicians of all disciplines, particularly specialists, than metropolitan areas. Not surprisingly, this scarcity carries over into the fields of nursing, therapy, psychology, and ancillary services. In the United States, the greatest shortages are found in remote rural communities with fewer than 10,000 people, where the physician supply has remained relatively unchanged since the 1940s. In urban areas, the physician-to-population ratio has more than doubled since 1960, while increasing by only 15% in rural areas. These trends are evident globally, in poor and rich nations, mostly due to the difficult working conditions in geographically remote areas. Factors that make the recruitment of healthcare providers difficult in rural areas include safety issues, inadequate infrastructure and supplies for effective treatment, low pay, poor housing and education for children, lack of social options, poor bonding with the local community, and significant distance from metropolitan areas.

The closure and mergers of many community and public hospitals over the past several decades has aggravated the shortage of healthcare personnel in many areas. When hospitals close, already underserved populations have to travel greater distances to access services. People who must travel farther often incur greater transportation costs, by taking off from work or due to loss of income. These factors may lead to delays in seeking treatment and adverse health outcomes, which may prove to be more costly in the long run. Pregnant women, children, the elderly, and the physically or mentally challenged are more prone to suffer from poor health outcomes due to poor access as they often need someone to accompany them to remote centers, and they may also lack transport facilities and funds.

Travel Burden

Transportation and healthcare access are directly linked to health outcomes. Travel burden is one

of the key components of conceptualizing geographic access to healthcare. Determinants of travel burden include arranging transportation and childcare, travel time, driving distance, transportation expenses, and the costs of missing work. Rural residents have the dual burden of lack of public transportation and living far from healthcare facilities. In rural America, only 1% of healthcare visits are made using public transportation. Those individuals without cars or who cannot drive must depend on family members or community resources to take them to clinics, which limits their control over appointment times and the choice of providers. Transportation barriers are also linked to a reduction in patient compliance with treatment plans, as well as limited use of preventive and public health services.

Measuring Geographic Barriers to Healthcare

Various measures of spatial accessibility and activity space are now commonly used to measure the distance between supply and demand. The healthcare sector also is adopting innovative geographic information systems (GIS) and technology to conceptualize and measure geographic access using spatial measurements. The term *spatial* refers to space on the earth's surface; spatial phenomena are concepts that can be shown on maps. Powerful computer hardware and software mapping tools are now available to project the distance between supply and demand. These tools can be used to identify geographic locations of future hospitals and clinics in order to provide equitable access to residents in that area.

Spatial accessibility combines the concepts of distance and the provision of healthcare, and it is used by health researchers in needs assessment. Spatial accessibility to healthcare can be classified into four categories: provider-to-population ratios, distance to the nearest provider, average distance to a set of providers, and gravitational models of provider influence.

Provider-to-population ratios, easily measured supply ratios, are computed within defined areas, such as counties, metropolitan areas, or health service areas. The numerator may be any indicator of health service capacity, such as the number of

physicians or hospital beds. The denominator is the population size within the area, usually computed from census files. Areas are analyzed for the relation between provider-to-population ratio values and some indicator of healthcare utilization or health status. These ratios are only useful for providing comparisons of large geopolitical areas; analysts rely on these ratios to identify medically underserved areas and minimal standards of supply.

The travel impedance, or travel cost to the nearest provider, another tool used to measure spatial accessibility, is considered to be a reliable measure for rural areas as people are most likely to visit the nearest health facility for care. Urban populations, on the other hand, often have a large number of provider options, so travel cost to the nearest provider is a poor indicator of availability.

Spatial accessibility can be better assessed by the combined measures of travel impedance and supply. Average travel impedance to providers is a combined measure of accessibility and availability, with similar points of measurement to travel impedance.

Also used as a measure of spatial accessibility, gravity models are an indicator of both accessibility and availability. They provide the most valid measures of spatial accessibility because they are applicable to both urban and rural settings.

Some drawbacks of using GIS are potential inaccuracies or incompleteness in data sources, which could lead to unjustifiable causal inferences from ecological associations. It is a reasonable assumption that improved spatial accessibility of healthcare should lead to better population health over a period of time. However, the relationship between changes in spatial accessibility of primary care and the time taken for an impact to occur is still being defined.

Activity space, defined as the local areas within which people move or travel in the course of their daily activities, measures individual spatial behavior within local environmental differences. It aims to provide a comprehensive picture of individual geographic accessibility to healthcare within an individual's sphere of movement. The number of healthcare facilities mapped inside this space indicates the degree of individual accessibility, while the number of facilities outside the given boundary represents the extra effort and expense required to gain access to care.

Telehealth

Telehealth is a resource that relies on technology to provide services, education, and medical consultations. Using telehealth to deliver services in remote areas has gained acceptance as a quick, easy method of offering timely healthcare, particularly for preventive, public health, and chronic care. However, the use of these services depends on Internet availability, access to computers, adequate literacy, and the ability to navigate the system. For struggling, low-income, or minority communities, these resources may be difficult to obtain. Also, the number of physicians willing to deliver online care is limited, as is the number of reimbursable online consultations. The ability to filter accurate online information from misleading Web content, which requires considerable health literacy skills, is an ongoing problem. Telehealth technology holds great promise as a tool for healthcare delivery and access in geographically remote areas, though, as the world is increasingly connected to the Web.

Efforts to Increase Access

In the United States, the federal government has designated Medically Underserved Areas (MUAs) and Medically Underserved Populations (MUPs) as those that face shortages of primary medical care, dental and mental health providers, and hospitals due to various reasons, including geographic barriers. MUAs and MUPs are funded to open community health centers and receive higher rates of Medicare and Medicaid reimbursable services in an attempt to address the growing health disparities due to closure of healthcare facilities. Closures particularly affect public health clinics and hospitals that provide free services to underserved populations in rural and impoverished inner-city neighborhoods, forcing these populations to travel longer distances for healthcare.

Future Implications

Geographic barriers to care exist worldwide and adversely affect health outcomes in even the most developed countries. The vast majority of people

who live in less affluent countries bear the brunt of adverse health outcomes due to these barriers. The scarcity of primary-care provision persists in spite of valiant attempts by governments to address the issue, primarily because of the lack of healthcare providers. Advances in GIS and technology have helped calculate the healthcare needs of populations. However, GIS is an expensive tool and may be unaffordable by many countries, and it cannot ensure an adequate supply of healthcare providers. Though transportation systems continue to improve in remote areas, geographic barriers to care are still responsible for persistent health disparities. Addressing these barriers is an ongoing challenge for health services researchers.

Karen E. Peters and Sunanda Gupta

See also Access to Healthcare; Critical Access Hospitals (CAHs); Geographic Information Systems (GIS); Geographic Variations in Healthcare; Rural Health; Telemedicine; Timeliness of Healthcare; Transportation

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GEOGRAPHIC INFORMATION SYSTEMS (GIS)

Geographic information systems (GIS) are computer-based systems for managing, integrating, and analyzing geographic data. Geographic data are observations or measurements of objects or events referenced explicitly to their locations on the earth. Location is the basis for integrating data in a GIS. GIS tools have been available for more than two decades and are widely used to integrate and analyze many different types of spatial data, including data on health needs, healthcare providers and facilities, health services delivery and utilization, healthcare accessibility, and health outcomes.

GIS implementation involves organizing people to use computer hardware, software, and spatial databases to answer questions or solve problems. The institutional context of this implementation plays a significant role in governing system design, application development, and database design. In the case of health services, the range of institutional settings for GIS implementation is especially wide and includes both public agencies and private entities operating at local, state, national, and international levels. These settings have implications for GIS data acquisition, integration, analysis, and distribution.

Spatial Database Management, Mapping, and Analysis

GIS tools support spatial database management, visualization and mapping, and analysis. Many public and private health agencies manage databases, usually stored and viewed as tables, describing the health status and health service utilization of individuals. GIS software functions can be used to make these data mappable at a high level of geographic disaggregation. The objects—for example, patients with specific health problems and the health facilities where they receive treatment—whose attributes are described in a health database can also be assigned spatial dimensions and attributes. Objects represented as points, such as the place where a clinic or patient resides, have position in space, and these positions are recorded using longitude and latitude coordinates or coordinates

from one of many other coordinate systems used for mapping. Lines are created by connecting the points; these lines can be routes for home-delivered healthcare services and similar factors. Health-planning districts might be represented as areas, objects formed by closed, connected lines. These types of spatial data are referred to as object, or entity, data. Vector databases are collections of discrete objects modeled as points, lines, or areas whose locations and other attributes are described. Vector databases that describe property parcels are sometimes referred to as cadastral databases. These databases are often used for local public health service applications such as drinking water regulation and emergency response.

GIS software functions enable users to import tabular data and to create and edit points, lines, and areas representing objects of interest. Tables of data containing *X*, *Y* coordinates, such as longitude and latitude values, captured using global positioning system (GPS) technology can be added to a GIS and converted to point databases. The United States and other nations use address-matching geocoding tools in GIS software to map locations of cases of disease, healthcare facilities, and other points of interest. The Healthy People 2010 initiative of the U.S. Department of Health and Human Services (HHS) revised its objective for the use of geocoding in health data systems to achieve 100% nationwide use of GIS by 2010 by increasing the proportion of major national health data systems that use geocoding.

Other types of information that can be managed and integrated using GIS include network data, raster data, and imagery. Network databases describe space in terms of paths and nodes in a network. The network, however, constitutes the entire space where objects can be located or events can occur. These databases are used for modeling service areas of facilities, finding the shortest network path between an origin and a destination, or finding the facility closest to a point.

Raster data provide measurements of continuous phenomena, such as air quality or land cover, taken at discrete locations in space. Digital remote-sensing databases classified to model surface vegetation, water, and the built environment are examples of spatial data using a raster data structure. Most GIS enable users to convert data from raster to vector and vice versa. Raster data have

been more widely used in epidemiological applications of GIS, especially those involving infectious disease, than in health services applications of GIS. Imagery includes scanned maps and digital images or photographs of the earth's surface. Imagery is increasingly important in all types of GIS applications, but image files must be accompanied by files containing information to register the locations of the pixels in the image to the earth's surface.

Data integrated in a health services application of GIS are commonly drawn from many sources. Health services providers have direct access to utilization data and to information on the locations of the facilities where they deliver services, but these are likely to be only a small part of the data needed to geocode addresses, analyze health information, and map data and results. Data on the need, or demand, for health services in vulnerable populations may be drawn from national or local census databases or health surveillance databases. Because health services needs are often age and gender specific, detailed demographic information is most useful. Data on the facilities of other service providers may be more difficult for a health agency to acquire. Most GIS applications rely on foundation data layers of street networks, political and administrative boundaries, and imagery that are acquired from government agencies or geographic database vendors. Database management is one of the most expensive and time-consuming tasks in GIS implementation.

Once data have been georeferenced, they can be displayed using the mapping and visualization function of the GIS. Confidentiality remains an important issue in health services applications of GIS that involve mapping. Research has demonstrated that maps used to display individuals as points, even when published at low resolution with few geographic reference features, may reveal patient location information in a way that breaches confidentiality. The process of reverse geocoding converts points on maps to addresses, and these conversions can be accomplished with a fairly high level of accuracy.

Critics of GIS as a surveillance technology acknowledge that the development of information systems such as the centralized universal-number emergency response systems benefits those receiving emergency medical care. Additional critique also demonstrates that this infrastructure, coupled

with technological advances such as wireless communications, has led to the growth of commercial systems capable of intruding on individual privacy through the capture and integration of a wide range of information, including health data. Although there is widespread recognition of the value of assigning geographic identifiers to health data, there is little agreement on their form, assignment, reporting, or use. Legislation such as the federal Health Insurance Portability and Accountability Act (HIPAA) of 1996 restricts the disclosure of health data, and many health surveillance databases, such as the National Health and Nutrition Examination Survey (NHANES) and the Health Survey of England (HSE), distribute data primarily at the national, state, or regional level.

Even when data are aggregated spatially and mapped by area, cartographic representations of health data must be carefully designed to communicate patterns of health and disease or medical-care accessibility effectively. GIS can produce multiple views of data, which is a major advantage in using the tool. Tables, summary statistics, and multiple cartographic representations can be created using these systems, providing a complete description of a health issue. In addition, the spatial analysis functions of GIS can provide insight into how partitioning data by areas affects analyses of health services utilization and other processes.

The spatial data analysis functions of GIS software often receive less attention than the mapping and visualization functions, but they are equally important. Spatial modeling functions include techniques such as buffering and overlay. Buffering can be used to identify all areas within a certain distance of a feature such as an emergency warning alarm. Overlay operations can be used to identify the portion of an area that lies within another area, so that people living within the service area of more than one medical provider can be identified. Mathematical modeling techniques used in GIS applications account for the influence of distances between objects and the geographical positioning of objects on patterns of interaction between objects. Models of healthcare accessibility consider factors such as the distance between residential communities and healthcare facilities. Spatial statistical techniques model dependencies in data and enable analysts to investigate health outcomes in context. All these

spatial, analytic operations result in new geographic databases that can be mapped to provide insights into a range of health services issues.

Health Applications

Few applications of GIS in public health, epidemiology, or health planning appeared before the 1990s. During that decade, interest in GIS and their use in health applications increased rapidly. The term *GI Science* was coined at this time to distinguish geographic information as a research field from the technology of GIS. As in other areas, GIS applications in health services have built on the theories and methods of spatial analysis, relevant long before the innovations that made GIS possible. The health services literature of the 1960s and 1970s, and even earlier, addresses and provides methods for analyzing the location and distribution of healthcare providers, patient origin patterns, facility service areas, medically underserved areas, and health services. Some of these methods, such as the use of spatial interaction models to study health services accessibility, have been implemented, fully or partially, using GIS functions, especially those system functions that are used to measure the distance to health service sites. The availability of GIS has led to a rediscovery of many spatial analytic methods applicable to health services research. And the use of this technology is likely to encourage the development of other new methods.

The shift toward greater privatization of health services that began in the United States in the 1980s, leading to less federal and state involvement in health services planning and regulation, coincided with the development of GIS. One consequence is that data on patient origins, provider networks, and healthcare insurance coverage became a form of proprietary business information, unlikely to be published by large healthcare organizations. Additionally, this information was unlikely to be accessible to public health researchers, either as public domain or through regulatory disclosure. For this reason, it is difficult to document the use of GIS in many areas of health services delivery or planning. The growth of managed care resulted in the creation of new health-related businesses—for example, companies that manage prescription drug benefits for major health insurance companies.

These entities have access to large databases on patterns of health service utilization that could be analyzed spatially. There is evidence that health insurance companies and other corporate entities use GIS as part of their operations, but few examples of these applications appear in the health services literature.

Geographic Dimensions of Health Services Analysis

Geographic analysis of health services has five main dimensions: (1) analyzing the geographic distribution of vulnerable populations and their need for services, (2) modeling the location and distribution of health services providers and their capacities, (3) describing patterns of health services delivery and utilization, (4) analyzing accessibility to health services, and (5) investigating disparities in health outcomes. Populations are not evenly distributed across regions, and local populations differ in age, gender, culture, and other characteristics that affect health status and the need for health services. For example, mapping the number of Black women 50 years of age and above gives an indication of the need for annual routine mammography screens. Figure 1 provides an example of such a map for Connecticut.

When people are placed in their community settings, the challenge for health services delivery becomes clear. In addition to health services planning, the design of randomized control trials (RCTs) and public health interventions needs to take into account the underlying spatial distribution of the target population. GIS tools are well suited for mapping and exploring geographical variation in the need for health services.

The supply of health services can also be investigated using GIS by mapping the locations and capacities of healthcare providers. For example, many hospitals have radiology units capable of providing mammography screens. GIS can be used to display the locations of these facilities in relation to the geographic distribution of need. It would also be desirable to map the locations of other providers of mammography services, including freestanding radiology centers, women's health centers, and other facilities. The number of appointment slots, days and times when appointments can

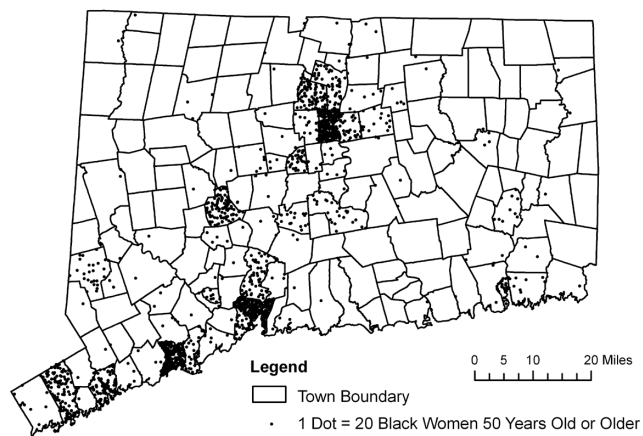


Figure 1 A Dot Density Map of the Distribution of Black Women 50 Years of Age or Older in a Town in Connecticut

Source: Summary File 1, U.S. Census 2000 and the Connecticut Department of Environmental Protection.

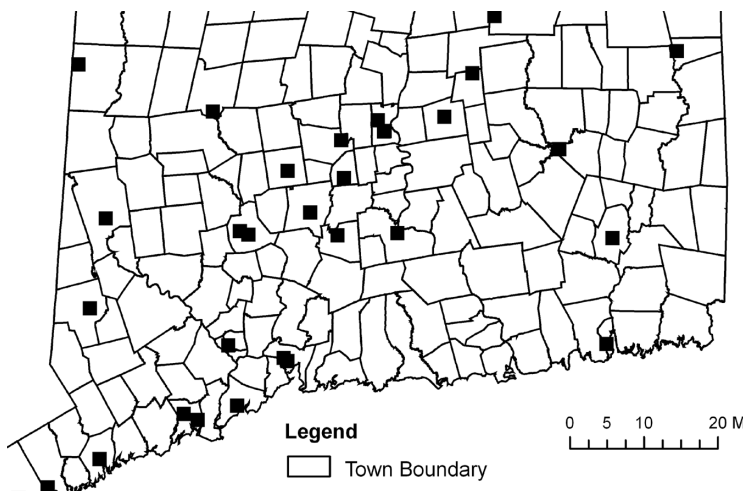


Figure 2 The Location of Community Hospitals in Connecticut

Source: Office of Health Care Access, Connecticut Department of Environmental Protection.

be made, and other attributes of the services provided that might affect who can access care should also be recorded. Figure 2 provides an example of such a map, showing the geographic distribution of community hospitals in Connecticut.

Healthcare providers can also geocode and map the residential locations of the patients they serve. This information can be used to identify the communities that send most of their residents to particular providers, as well as the providers that treat

and serve the most number of residents of particular communities. Patient origin areas may differ widely depending on the particular service offered, even for the same healthcare facility.

In addition to measuring the attractiveness of the services and the level of competing demand for the services from patients in other communities, models of geographical accessibility to health services usually involve some measure of distance between potential patients and service sites. The network analysis functions of GIS can be used to estimate the area within a specified travel distance or travel time from a facility. Measuring travel time along a network often yields a much more accurate measure of distance than creating a simple distance buffer. Figure 3 reflects the measurement of travel time.

Modeling geographical coverage of existing healthcare facilities provides insight into areas that are not covered or are underserved by the existing supply of healthcare providers. This information can be used to plan for the redistribution of capacity across service sites, the location of new services, or the location of alternative services. It can also be used to evaluate the characteristics of populations that have different levels of access to healthcare services.

GIS tools make it possible to understand patterns of health and disease in the context of healthcare services accessibility. The geographical organization of health services, the geographical differences in accessibility to healthcare, and the geographical reach of surveillance and screening systems may act to filter the underlying distribution of health problems and influence the apparent geographical distribution of health problems mapped by health analysts. Increasingly, information on health conditions and health services is delivered through the Internet.

GIS and the Internet

Changes in computing technology were recognized as major drivers in the development and rapid diffusion of GIS to new application areas.

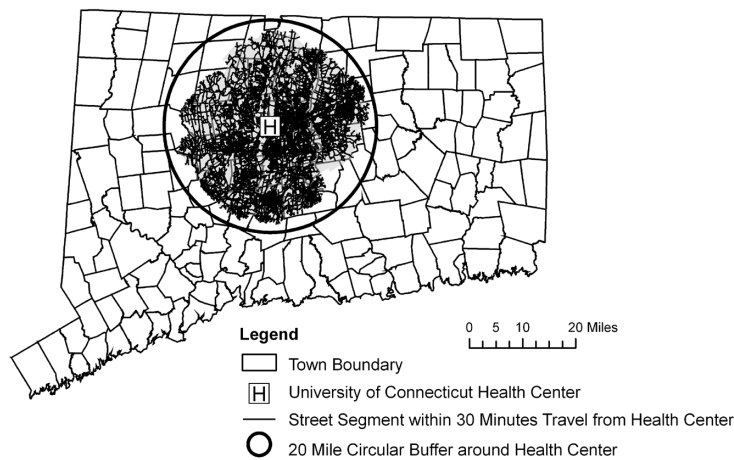


Figure 3 Network Analysis Identifying the Service Area Neighborhood Within 30 Minutes of Travel Time Based on 40-mph Travel Speed and a 20-Mile Buffer

Source: Office of Health Care Access and the Connecticut Department of Environmental Protection.

In the early years of GIS adoption, the use of workstations and desktop computers with larger memories and improved graphics capabilities, the availability of inexpensive and reliable printers, and the emergence of networks were among the most important developments affecting GIS. During the first decade of this century, both the Internet and wireless networks and devices are having a significant effect on geospatial information technology. The development of GIS on the Internet has the potential for broadening access to geographic data because data users do not need to have GIS software or databases on their own computers or wireless devices. GIS software companies offer Internet map server products supporting online systems. The launch of Google Earth in 2005, however, provided organizations with a different framework for delivering cartographic displays of geographic data, one that does not rely on GIS software packages.

Distributed GIS supports four main activities: (1) data sharing, (2) information sharing, (3) data processing, and (4) location-based services. Data in original format and metadata describing the geographical database may be published for downloading on an organization's Web site or through a data clearinghouse portal. The U.S. Census Bureau's

Web site distributes cartographic boundary files of census units that can be used in GIS. Similarly, government agencies such as the Health Resources and Services Administration (HRSA) participate in the government's Geospatial One Stop portal. Alternatively, organizations such as the National Cancer Institute (NCI) can use GIS to share information by publishing static maps or maintaining interactive Web-based GIS that allow users to map data. Another type of distributed system involves serving GIS analysis tools. This type of application is most commonly used within an agency to allow staff members to manage spatial databases. Location-based services enable users to access information about a location and nearby areas. A person seeking healthcare can use location-based services to find the nearest provider and determine the best route to a particular destination.

Future Implications

Although GIS technology developed outside the sphere of public health, the systematic application of computer science and information technology in public health and healthcare is not new. The same forces affecting GIS today are also fostering a population-focused, experience-based, and research-oriented approach to public health information systems in the emerging field of health informatics. GIS tools play an important role in these systems by supporting the geocoding, mapping, and spatial analysis of health and health services data.

Ellen K. Cromley

See also Access to Healthcare; Epidemiology; Geographic Barriers to Healthcare; Geographic Variations in Healthcare; Healthcare Markets; Health Informatics; Health Planning; Public Health

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GEOGRAPHIC VARIATIONS IN HEALTHCARE

Geographic variations in healthcare are the differences in healthcare services delivery to patients based on the location where they receive them. John E. Wennberg, a New England physician, first described the phenomenon of geographic variation in healthcare in the late 1960s after finding small area variations based on Medicare spending. Although some variation in the delivery of healthcare is justified and acceptable, unwarranted variations in the delivery of healthcare services leads to differential medical spending and treatment across regions of the nation with

no clear benefits in patient outcomes or healthcare quality. Geographic differences have been reported across the healthcare system, from the intensity of hospital use and end-of-life care to the patterns of elective surgeries. The geographic differences reported in healthcare delivery have raised many important questions for health services researchers on what and how much care is appropriate and what is the relative value of the differential spending and treatment across regions.

Overview

The use of healthcare services and the associated spending patterns vary greatly across the nation. Geographic variations in healthcare are generally measured over large areas, such as at the state level, while measurement of smaller geographic areas can focus on counties, metropolitan statistical areas, and hospital referral areas. Medicare patient data have been extensively used to study geographic variations in the United States, because of the large number of patients and the readily accessible data.

In 1967, Wennberg analyzed Medicare data to examine how this program was serving communities. Through his research, Wennberg found unwarranted differences in patient care that could not be explained by the severity of patients' illnesses, medical need, or evidence-based medicine. Over the years, Wennberg and others have found many geographic variations in healthcare. Recently, Wennberg's Dartmouth Atlas of Healthcare Project reported finding differences in hemoglobin A1C testing for Medicare patients with diabetes, ranging from 91% in Vermont to 71% in Alaska. It also reported differences in Medicare beneficiaries who have a primary-care physician as the predominant provider, ranging from 86% in Nebraska to 65% in New Jersey.

The unwarranted differences in healthcare across regions can be attributed to effective care, meaning clinically proven treatments, and patient safety; preference-sensitive care, or patient's choices in their treatment; and supply-sensitive care, or care that is associated with the healthcare system's resource capacity and supply. The majority of the geographic differences in healthcare, however, can largely be attributed to supplier-sensitive care. The

underlying theory is that because there is a lack of firm evidence to treat many medical conditions, the general assumption is that more care leads to better patient outcomes. Therefore, in areas with more healthcare resources, the tendency of healthcare providers is toward greater intensity of healthcare services.

The notion of supply-sensitive care overlaps with the concept of supplier-induced demand. Supplier-induced demand was first identified in the early 1960s by the public health professor Milton I. Roemer (1916–2001). Roemer found that when health insurance was widespread in a community, increased utilization of services resulted in an increase in the supply of hospital beds. Roemer coined the saying “A bed built is a bed filled.” This finding became known as the Roemer effect, or Roemer’s law.

Geographic differences in care can also arise from the uneven distribution of morbidity. For example, the higher rates of cardiovascular procedures in the southeastern United States may be due to the higher prevalence of tobacco use in this area. Also, certain regions may be more apt to adopt low-cost and effective healthcare practices, while other regions may maintain high-cost practices, leading to further differences across areas.

Geographic differences in healthcare also result in differences in spending across regions. For example, in 2004, the per capita spending in Utah was \$2,400 compared with \$6,700 in Massachusetts. These differences persist even at smaller geographic levels and even among providers. Research conducted by the Dartmouth Atlas of Health Care found that among Medicare beneficiaries with similar health status, those living in high-spending areas received 60% more healthcare services than those who live in low-spending areas. Some researchers predict that Medicare spending would decrease by 29% if spending in high- and medium-spending areas was equivalent to that in low-spending areas.

The geographic differences in patient care and spending that have been highlighted indicate that the healthcare system is not as efficient as it could be. There is a growing body of literature suggesting that the overuse or misuse of and increased spending on healthcare services do not produce better care or improved patient outcomes.

Overall, differences in geographic spending on healthcare have been increasing over the years; however, the variation in Medicare spending has decreased recently because of changes in its reimbursement policies. The Veterans Health Administration (VHA) has also experienced geographic differences in healthcare spending despite a national resource allocation formula.

Small-Area Variation Analysis

Small-area variation analysis, developed by Wennberg and Gittelsohn, is a tool that is used by health services researchers to understand the geographic differences in the rates of healthcare utilization and also how this varies over defined areas. Because of the substantial variation in healthcare utilization and spending across regions of the country, small-area variation analysis uses established epidemiological methods to better grasp the causes of these variations across similar communities, which can help guide healthcare decision making and resource planning. Because healthcare is provided at the local level by physicians and other providers, the differences in medical treatment at this level appear to be due to the different prevailing practices. Small-area variation analysis has become an important technique that researchers use to disentangle the disparities in healthcare utilization and treatment as well as provide further insight into whether or not more care leads to better health outcomes. Some areas of concern regarding the proper use of small-area variation analysis are accurate defining of geographic boundaries, the population at risk, case-mix adjustments, and the stability of rates across time. The further development of small-area variation analysis will entail the development of more refined measures, case-mix adjustment, and appropriate small areas to be examined.

Future Implications

It is likely that geographic variations in healthcare will continue to persist in the future given the uneven distribution of disease and of healthcare providers across the nation. Although there will always be some random geographic and regional differences in the care that patients receive, it is the clinical and statistical significance

of the disparities in care that are of concern. The wide variation in agreement regarding the risks and benefits of certain treatment options for specific diseases due to patient and provider preferences will further yield differences in care. Health services research will play an integral role in providing a deeper understanding of the underlying reasons for the unwarranted differences in care, as well as in helping ascertain the appropriate amount of care needed to yield maximum clinical effectiveness.

Jared Lane K. Maeda

See also Flat-of-the-Curve Medicine; Geographic Barriers to Healthcare; Geographic Information Systems (GIS); Health Disparities; Medicare; Roemer, Milton I.; Supplier-Induced Demand; Wennberg, John E.

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GINSBURG, PAUL B.

Paul B. Ginsburg is president of the Center for Studying Health System Change (HSC). Founded in 1995, the HSC conducts research to inform policymakers and other audiences about changes in the organization, financing, and delivery of care and the effects on people. Data are gathered through the Community Tracking Study, which includes surveys of households and physicians and site visits to interview health system leaders in 12 communities that are representative of the nation. The HSC is widely known for the objectivity and technical quality of its research and its success in communicating results to policymakers and the media, as well as to the research community. A sister organization to Mathematica Policy Research, the HSC is funded principally by the Robert Wood Johnson Foundation but also receives funding from other foundations and from government agencies.

Before founding the HSC, Ginsburg served as the founding executive director of the Physician Payment Review Commission (PPRC), now the Medicare Payment Advisory Commission (MedPAC). Widely regarded as highly influential, the commission developed the Medicare physician payment reform proposal enacted by the U.S. Congress in 1989. Ginsburg was also a senior economist at the RAND Corporation and served as deputy assistant director at the U.S. Congressional Budget Office (CBO). Before that, he served on the faculties of Duke and Michigan State Universities. He earned his doctorate in economics from Harvard University.

Ginsburg is a noted speaker and consultant on the changes taking place in the nation's healthcare system and its future outlook. He frequently testifies before the U.S. Congress. In addition to presentations on the overall direction of change in the healthcare system, recent topics have included cost trends and drivers, consumer-driven healthcare, provider payment, and the future of employer-based health insurance and competition in healthcare. In 2007, for the fifth time, Ginsburg was named by *Modern Healthcare* as one of the 100 most powerful people in healthcare. He recently received the first annual Health Services Research Impact Award from AcademyHealth, the professional association for health policy researchers and analysts. He is a founding member of the National Academy of

Social Insurance and a public trustee of the American Academy of Ophthalmology; he served two elected terms on the Board of AcademyHealth.

Alwyn Cassil

See also AcademyHealth; Center for Studying Health System Change; Congressional Budget Office (CBO); Forces Changing Healthcare; Mathematica Policy Research (MPR); Medicare Payment Advisory Commission (MedPAC); RAND Corporation; Robert Wood Johnson Foundation (RWJF)

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Center for Studying Health System Change
(HSC) Staff Profile: <http://www.hschange.com/index.cgi?file=staff#ginsburg>

GINZBERG, ELI

Eli Ginzberg (1909–2002) was a writer, scholar, teacher, government consultant, policy analyst,

and one of the first health economists in the United States.

Ginzberg was born in and lived most of his life in New York City. He had a very long and well-respected tenure at Columbia University, where he earned his bachelor's (1931), master's (1933), and doctoral (1935) degrees. In 1935, he began his teaching career at Columbia University's faculty in the Graduate School of Business. He would go on to teach at Columbia for more than 60 years. Ginzberg's early years at the university exposed him to experiences that helped prepare him for his interests in public policy and healthcare. During World War II, he helped plan healthcare services for wounded soldiers and discharges for military physicians. In 1943, Ginzberg helped prepare for the 1944 European invasion by U.S. forces by serving as chief logistical advisor to the Surgeon General of the Army. In 1946, he returned to Columbia University and eventually retired from the faculty in 1979, although he continued teaching classes at the university.

Ginzberg served as director of the Eisenhower Center for the Conservation of Human Resources at Columbia University and director for the Revson Fellows Program on the Future of the City of New York. From 1962 through 1981, he served as chair for the National Manpower Advisory Committee. In 1982, Columbia University awarded him an honorary doctorate of letters.

Ginzberg's interests centered on people and the conditions in which they lived and worked. For example, in the 1960s, it was thought that there was a national physician shortage, and efforts and funds were directed toward building new medical schools, upgrading older programs, increasing student enrollments, and providing financial aid opportunities. Ginzberg countered the claim by declaring that the physician shortage was only in low-income and high-poverty areas, and even if the number of physicians in the graduating classes was increased, these socioeconomic areas would continue to be underserved. His solution was to train more paraprofessionals, nurse practitioners, and physician assistants as well as to restructure the manner in which the medical services were delivered to this portion of the population.

Several times throughout his career, he addressed the education and utilization of nurses. Because he thought that hospital training exploited nursing

students, he advocated for nursing education to become the responsibility of higher education. To improve the nursing profession's status, Ginzberg recommended that graduate programs include management courses in the curriculum. Addressing the various levels of education found in the nursing profession and the need to improve working conditions and job satisfaction, Ginzberg recommended tying levels of responsibilities to the nurses' education, with the more educated nurses having higher levels of responsibilities.

Acknowledging the U.S. culture of individualism and its socioeconomic structure, he stressed the need for national health insurance to provide essential medical care as well as policies addressing the health sector's shortcomings in the areas of access, costs, and quality of care.

Ginzberg, a prolific writer, was interested in the human experience and human resources. He was one of the first health economists, and his work continues to influence health policymakers.

Anne L. Buchanan

See also Health Economics; Health Professional Shortage Areas (HPSAs); Health Workforce; Nurse Practitioners (NPs); Nurses; Physicians; Public Policy

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GROSSMAN, MICHAEL

Michael Grossman is a well-known health economist, who has spent much of his long, distinguished career in two organizations: the National Bureau of Economic Research (NBER) and the City University of New York (CUNY). Grossman was one of the first economists to use the concept of human capital in healthcare research. He has greatly influenced the field of health economics through his research and the many students he has mentored and trained.

Born in 1942 in Brooklyn, New York, Grossman received his bachelor's degree from Trinity College in 1962. He attended graduate school at Columbia University, where he earned a doctoral degree in economics in 1970.

In 1966, Grossman began his long affiliation with NBER. At NBER, Victor Fuchs, a well-known health economist, hired him as a research assistant. Grossman held a number of positions at the organization, and in 1972, he became a research associate and Program Director of Health Economics Research, a position he presently holds.

In 1972, Grossman began his long affiliation with the CUNY. He started at the university as a visiting assistant professor and successfully rose through the academic ranks. In 1978, Grossman was appointed professor, and in 1988, he became Distinguished Professor of Economics, a position he presently holds. In addition to teaching, he also served as the executive officer (chairperson) of that university's doctoral program in economics from 1983 to 1995. And he has supervised nearly 100 doctoral dissertations.

Grossman has conducted research and written extensively on a wide variety of health economic topics including the following: economic models of the determinants of infant, child, and adult health; the cost of capital for tax-exempt hospital bonds; the introduction of national health insurance in Taiwan; the impact of taxes on cigarette smoking and alcohol use; and the economic factors associated with adult obesity. He has authored or coauthored four books, more than 40 academic journal articles, and numerous book chapters.

His first book, *The Demand for Health: A Theoretical and Empirical Investigation*, is considered a seminal work. The supply and demand model of healthcare he presented in the book has greatly influenced the field of

health economics and is widely cited in the literature. His most recent book, edited with Chee-Ruey Hsieh, is *The Economic Analysis of Substance Use and Abuse: The Experience of Developed Countries and Lessons for Developing Countries*.

Grossman is a coeditor of the *Review of Economics of the Household*, a series coeditor of *Advances in Health Economics and Health Services Research*, and an associate editor of the *Journal of Health Economics*. He also reviews manuscripts for many other healthcare journals.

Grossman has received numerous academic and professional honors for his work. Grossman has been a consultant to the National Institute on Alcohol Abuse and Alcoholism, the National Academy of Sciences, the National Science Foundation, and the RAND Corporation. He is included in *Who's Who in America* and *Who's Who in Economics*, and he is an elected member of the National Academy of Sciences, Institute of Medicine (IOM). In 2008, Grossman won the Victor Fuchs Lifetime Contribution Award from the American Society of Health Economists (ASHE).

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See also American Society of Health Economists (ASHE); Fuchs, Victor R.; Health Economics; Obesity; Public Health Policy Advocacy; Public Policy; Tobacco Use

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H

HEALTH

The World Health Organization (WHO) defines health as “a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity.” This definition is perhaps the most well known and also the most criticized, mainly because it is difficult to operationalize for achieving (and measuring) health. Despite its lack of specificity, however, the definition introduces the social dimension of health. For the WHO definition to be useful in health research and practice, physical, mental, and social well-being must be interpreted in specific social, political, and cultural contexts.

Different conceptualizations of health indicate different determinants of health. These determinants of health, in turn, prompt specific public policies and individual behaviors for achieving health. For example, suppose health is considered as the normal physiological functioning of the bodily organs. If contaminated water is believed to disturb the normal functioning of the organs, then social policies would regulate water quality, while individuals might choose not to drink tap water. In another example, if a society considers health as active social participation, then social policies would be in place to remove barriers to social participation, and individuals would seek out opportunities for social activities.

The various ways of conceptualizing health are reflected in social policies and individual behaviors. These conceptualizations also hold different

parties accountable. If a society conceives that good or ill health is a consequence of an individual’s discretionary behaviors (e.g., washing hands before handling food to avoid food poisoning), then individuals would be responsible for their own health. Conversely, if a society regards health as a reflection of social and political systems (e.g., increased infant mortality after community health center funding is cut), then policymakers would be held accountable. Societies and individuals have different and complex matrices of causality and accountability for various health outcomes. Some health conditions are attributed to individuals, while others to social policy or even to uncontrollable forces (e.g., fate, nature). Health services researchers and policymakers must recognize the strengths and limitations of the various conceptualizations of health that they use in studying health-related issues, shaping public policy, and providing services.

In the following sections, the philosophical underpinnings for the definition of health will be discussed, and the ways in which different views of health are reflected in various measures of health will be examined. Next, various determinants of health from a social-ecological perspective will be reviewed. Finally, the question of who is responsible for health is addressed.

Naturalist and Normativist Definition of Health

The definition of health has long been a subject of debate among philosophers. Two major, contrasting

perspectives have been proposed. Derived in the 1970s from the traditional biomedical standpoint, the *naturalist* view defines health as the freedom from disease, which, in turn, is defined as the inability of one's body to perform all the typical physiological functions with at least typical efficiency. This view places health and disease (or death) at the two poles of a continuum, and individuals find themselves somewhere between the two poles. According to this definition, for example, a person with diabetes cannot be "healthy," even if his or her condition is well managed with insulin, because his or her body is not able to perform all the typical physiological functions.

A contrasting definition of health was proposed in the 1990s. The *normativist* view defines health as a person's ability to achieve his or her vital goals given standard circumstances. Advocates of the normativist perspective suggest the possibility of people being healthy (i.e., able to achieve important life goals) despite functional limitations. Consider, for example, the athletes who compete in the Paralympics. While the normativist definition considers them healthy, perhaps healthier than many others without functional limitations, these athletes cannot be healthy according to the naturalist definition because of their physical or mental disabilities. In other words, the normativist definition allows every individual, regardless of his or her physical and mental abilities, the possibility to be healthy and become healthier.

The debate continues between the proponents of these two perspectives, which are not mutually exclusive; that is, individuals would have a better chance for achieving their vital goals if they were free from impairments in physical and mental capacities. However, having physical or mental malfunctions does not necessarily prevent people from achieving their life goals, especially with the ever-advancing medical technologies. As medical management of many diseases (i.e., physiological malfunctions) progresses, an increasing number of individuals survive and live well with their diseases. For example, about 1 in 10 adults in the United States currently has diabetes, and the 5-year survival rate for breast cancer increased from 60% to 86% between 1950 and 2000. More generally, life expectancy has been increasing in developed countries, indicating that more and more people are attaining advanced age. These

changes in society force us to consider how health and well-being may coexist with disease and functional limitations. While the naturalist definition of health is important in advancing medical research on managing disease, the normative definition of health—with its focus on wellness rather than illness—better informs health research and practice.

Measures of Health

The different perspectives on health have implications for health measurement. The naturalist definition sees a person as a physiological being; therefore, measures of health based on this definition are in fact measures of physiological functioning. The long history of medicine has provided a wide array of measures for assessing individuals' physiological functioning, from blood cell counting to magnetic resonance imaging (MRI). These measures are objective in the sense that others can judge a person's health status, often medical professionals. This is a valuable approach as some serious medical conditions can develop without outward signs (e.g., hypertension or high blood pressure). Especially for preventive purposes, not waiting for overt symptoms to appear is an important practice.

These objective measures are useful in detecting a medical condition that has a clear physiological definition (e.g., blood pressure as a measure of cardiovascular health). However, if health is more than just the absence of disease, these functional indicators may not fully capture one's health status. If health is the ability to achieve one's vital goals, a person's assessment of his or her own health can be a valid measure. A well-known example of such a measure is a simple question asking people to rate their general health status as *excellent*, *good*, *fair*, or *poor*. This measure has been found to be predictive of mortality: Studies have found that people who rate their general health status as *poor* had a nearly twofold higher mortality risk, a relationship that did not change when it was adjusted for functional status, depression, and chronic diseases. These findings imply that if functional status, depression level, and chronic-disease status are the same, those who rate their health as *excellent* were more likely to survive for a certain time period than those who rate their

health as *poor*. What is captured in this simple self-rated health question may be the normativist view of health. Despite this utility, however, the measure has a major limitation: It does not inform health services researchers or policymakers regarding which strategies would improve the person's self-rated health status. Self-rated health is, therefore, most useful as an *outcome indicator* for social policies and programs.

The objective (i.e., physiological) and subjective (i.e., evaluative) measures of health have advantages and limitations that complement each other. Therefore, using them together will provide a better description of health. Because refined observational-biomedical measures of health, which the naturalist definition of health calls for, contribute to successful interventions, such measures will help detect medical conditions in their early stages and monitor the progress of treatment. Better management of medical conditions is a way of enabling individuals to be healthy in the normativist view also (i.e., being able to achieve vital goals). It is possible, however, that sometimes the management of disease fails to enhance health in a normative sense (e.g., invasive treatment for cancer that results in isolation from the family and home environment). Evaluative measures of health capture this potential disjunction between well-being and a lack of disease.

Determinants of Health

Various factors affect health at different levels, from micro (e.g., bacteria) to macro (e.g., socioeconomic position). They do not exist in isolation: These factors are embedded in the next larger factors. For example, diabetes (a physiologically defined state) may be caused by a poor diet and a lack of exercise (behavioral risk factors), which may, in turn, reflect a lack of access to nutritious fresh food and a safe place for exercising (social factors). The social-ecological perspective promoted in public health provides a framework to integrate these different levels of health determinants.

In this section, four determinants of health with various levels of proximity to the person will be discussed. Topics discussed under each determinant are not exhaustive but, rather, are suggestive of important issues in current research and practice.

Biological Determinants

The most proximal determinants of health are often biological. Centuries of medical research have identified numerous biological, causal factors of disease and developed treatments for many of them. Although various infectious diseases have been effectively controlled, new diseases continue to emerge, some with drug resistance. Today, infectious diseases such as influenza and AIDS are listed among the leading causes of death.

Genetics is also a major biological determinant of health. Recent advances in genetic technology have identified genes responsible for diseases such as breast cancer and Huntington's disease. It is now possible to know whether a person has a specific gene mutation that will manifest itself as a disease. Genetic testing is potentially beneficial because the individual can take the necessary precautions to reduce the damage caused by the disease. However, the emotional, social, and financial consequences of knowing one's genetic predisposition must be considered. For example, growing attention has been paid to "genetic discrimination" by health insurance companies and employers against individuals with known genetic mutations that may require expensive medical intervention once the disease manifests. Because genetic predisposition is not modifiable, the social and psychological consequences of knowing it could be devastating.

Behavioral Determinants

It has been estimated that tobacco use, poor diet and physical inactivity, and alcohol consumption account for nearly 40% of all deaths in the United States. The deaths caused by these behavioral risk factors are, in theory, preventable by reducing these unhealthy behaviors. Other behaviors that have an impact on health include illicit drug use, immunization, and various safety practices (e.g., using a child seat in the car). The Center for Disease Control and Prevention (CDC) conducts the Behavioral Risk Factors Surveillance System (BRFSS) to monitor the trends in health behaviors in the United States.

Social Determinants

The significant impact of social interaction on health has been well documented. Social support is

associated with lower mortality from all causes, and the health-enhancing effect of social support is observed in relation to many health conditions (e.g., depression, cardiovascular disease, cancer, and infectious diseases).

One of the most robust social determinants of health is the individual's socioeconomic position in society. The Whitehall studies—longitudinal studies of more than 10,000 British civil servants—documented a *social gradient of health*: the higher a person's socioeconomic position, the better his or her health status. This gradient was found even between those at the top and those second to the top in the occupational hierarchy. Similar or sometimes steeper gradients by education, income, and occupational prestige are found in the United States. Many studies have found that the social gradient of health is partly explained by material deprivation, inadequate access to healthcare, and unhealthy lifestyle. However, the social gradient of health does not disappear after these factors are taken into consideration. The causal link between socioeconomic position and health is not yet well understood, but the stress associated with socioeconomic disadvantage is suspected as an explanatory factor.

The WHO has established the Commission on Social Determinants of Health (CSDH) to address societal causes for health inequalities, including poverty, social exclusion, work conditions, unemployment, and poor housing. The committee asserts that the social gradient of health reflects the gradients of two fundamental human needs: autonomy and social participation. That is, the lower a person's socioeconomic position, the less autonomy and social participation the person has, and this relative deprivation is detrimental to health.

Ecosystems

The quality of the air, water, and soil can affect the health of current and future generations. Many elements in the environment (e.g., lead, radon, nitrogen dioxide, and persistent organic pollutants) have been identified as potentially causing various health conditions ranging from skin or respiratory irritation to cancer and infertility. These identified hazards are only a fraction of the numerous chemicals released into the environment through

industrial wastes and commercial products. Most of these chemicals are not tested for the potential health effects of long-term exposure. Therefore, constant monitoring of environmental hazards is needed for identifying and controlling adverse health effects.

Although the impact of environmental hazards is a serious public health problem, in general, special attention should be given to the unequal exposure to environmental hazards experienced by people of different races and classes (i.e., *environmental injustice*). For example, hazardous waste sites are more likely to be found in racial-minority and low-income communities. This differential exposure may be responsible for health disparities. Since 1994, the U.S. Environmental Protection Agency (EPA) has launched the environmental justice strategy to reduce the unequal distribution of environmental burden.

Who Is Responsible for Health?

Each level of the determinants of health holds different entities potentially responsible. Identifying the determinants of health, therefore, has implications for health accountability. For biological determinants, an individual may feel powerless and turn to medical professionals to take charge of restoring his or her health. For behavioral determinants, individuals themselves may be held accountable for their health through maintaining healthy lifestyles. For social determinants, social institutions (e.g., schools, work organizations, health service providers, medical-insurance companies, and governments) need to be involved in reducing health-compromising factors. For preserving healthy ecosystems for all communities, all who are affected by the ecosystem should have an equal voice in environmental regulations and policies. Who is responsible for reducing health-compromising factors and increasing health-promoting factors? Who should bear the cost? Consequently, how should resources be allocated to enhance health? These questions are matters of serious debate. The answers may be different for each health condition and afflicted group.

Identifying health determinants and health accountability ultimately influences public health policy and intervention. The resources available

for public health intervention are limited. To achieve the maximum impact with the limited resources, policymakers must identify the most effective targets for change (i.e., high-impact leverage points), which may vary by different health outcomes. The social-ecological model suggests that because diverse human and environmental determinants of health are interrelated, changes in one factor potentially affect other factors and create synergetic effects. For example, a smoking ban in public space, originally intended to reduce environmental tobacco smoke, may encourage some people to quit smoking. Finding the high-impact leverage points to enhance the health of society will require a broad definition of health and a thorough understanding of its underlying causal factors.

Health is such a fundamental concept of human existence that many people intuitively believe that they know what health is. However, health services researchers and policymakers must recognize the different definitions of health as well as the consequences of adopting a certain definition over others. The conceptualization of health dictates whether or not certain factors are considered as determinants of health, which, in turn, determines policy and intervention. Social forces such as the political climate, the global and national economies, culture, and history influence this process of defining health, identifying the determinants of health, and establishing social policy. Recognizing the complexity of health as a concept is imperative for research and practice.

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See also Community Health; Disability; Disease; Morbidity; Mortality; Public Health; Public Policy; World Health Organization (WHO)

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U.S. Environmental Protection Agency (EPA): Environmental Justice: <http://www.epa.gov/compliance/environmentaljustice/index.html>

World Health Organization (WHO): Commission on Social Determinants of Health (CSDH): http://www.who.int/social_determinants/en

HEALTHCARE COST AND UTILIZATION PROJECT (HCUP)

The Healthcare Cost and Utilization Project (HCUP) is a family of healthcare databases and software tools developed to facilitate research on a broad range of health policy issues. HCUP represents the ongoing, collaborative efforts of federal, state, and private agencies and institutions to build a national information resource of patient-level healthcare data and to make these products available for use in health services research and health policy analyses. These efforts have culminated in the largest collection of longitudinal, discharge-level data on hospital care in the United States. Based on information from HCUP, quality indicators (QIs) that measure the clinical performance of hospitals have been developed to aide in quality assessment and continuous quality improvement efforts.

Development

In response to increasing concerns about health-care quality and the growing interest in tools for quality assessment, the Agency for Healthcare Research and Quality (AHRQ) initiated the HCUP in 1989. HCUP was charged with creating a national, comprehensive, and uniform data set of hospital inpatient records and developing a set of healthcare QIs that could be used with hospital administrative data for health policy analysis. Many organizations lack the resources necessary for extensive data collection and a quality measurement system for continual and comprehensive monitoring of quality. Furthermore, the definitions and formats of administrative data vary widely from state to state, making interstate comparisons difficult. HCUP was developed to address the infrastructural barriers that were hindering quality improvement by minimizing the burden on the healthcare industry and states in collecting, standardizing, and distributing national hospital data.

Since its inception, HCUP has grown in size and scope. The first release of HCUP data consisted of a statistical sampling of data on inpatient stays in community hospitals from 11 participating states. Currently, agencies and hospitals from a total of 38 states provide census hospital administrative data, representing 90% of all hospital discharges in the United States. HCUP data originally featured aspects of hospital inpatient care but now also includes outpatient care provided at U.S. community hospitals. The first products of the project were the Nationwide Inpatient Sample (NIS) data set, a statistical sampling of hospital discharge data, and a set of clinical performance measures constructed from the NIS and known as the HCUP Quality Indicators (HCUP QIs). Today, HCUP is a suite of databases, software, tools, and reporting and support systems that enable research on health outcomes and policy at the local, state, and national levels.

Databases

The HCUP maintains several databases, each of which contains encounter-level records for both insured and uninsured patients and are compiled in a uniform format. HCUP data report information

at the state and national levels on inpatient and ambulatory/outpatient care provided to adults and children in the United States from as early as 1988. The State Inpatient Databases (SID), Nationwide Inpatient Sample (NIS), State Ambulatory Surgery Database (SASD), Kids' Inpatient Database (KID), and State Emergency Department Databases (SEDD) are all included in HCUP.

HCUP Quality Indicators

Building on data from the project, HCUP QIs were constructed as a low-cost, ongoing, quality measurement resource to aide continuous quality improvement efforts. Rather than addressing dimensions of quality such as patient satisfaction or efficiency, the HCUP QIs were developed, in 1994, to measure clinical performance. HCUP QIs comprise a set of 33 measures of clinical performance to be used as a screening tool to identify quality concerns for further research and analysis. Development of these measures was performed in several phases: a review and evaluation of existing measures, the selection and specification of measures, distribution and empirical testing, and further refinement. The indicators spanned the following three dimensions of hospital care quality: (1) outcomes following surgery, including mortality and complication rates, by procedure; (2) utilization, such as the rate of cesarean section or coronary artery bypass graft; and (3) access to primary care, looking at factors such as low birth weight and vaccination rates among older patients.

Despite the methods and expertise employed in their development, careful reviews of the empirical literature and the methods employed in HCUP QI measurement revealed several limitations. The majority of HCUP QIs measured surgical-care performance and, thereby, inadequately represented the care of chronic medical conditions. Some measures were not useful in screening for real quality concerns. Moreover, some indicators were inappropriately based on hospital-level, rather than area-level populations. Last, the measures lacked adjustments for risk and severity. To address these limitations, the AHRQ sponsored new efforts to further refine the QIs. Between 1998 and 2002, select HCUP QIs were removed, and revised methods were invoked for the creation of new and

improved measures. Under its new name, the AHRQ Quality Indicators (AHRQ QIs) are a refinement of the HCUP QIs.

AHRQ Quality Indicators

Similar to HCUP QIs, the AHRQ QIs are measures of healthcare quality based on hospital, inpatient, administrative data available in the NIS. New methods, addressing the above-mentioned weaknesses of the HCUP QIs, were used to develop the AHRQ QIs. The new measures have also been reorganized into four foci of quality: (1) preventive care (Prevention Quality Indicators [PQIs]), (2) inpatient care (Inpatient Quality Indicators [IQIs]), (3) pediatric care (Pediatric Quality Indicators [PQIs]), and (4) patient safety (Patient Safety Indicators [PSIs]).

Although the AHRQ QIs represent conceptual and methodological improvements over the previous HCUP QIs, limitations remain. Development of the AHRQ QIs is based on administrative data, and the documentation of patients' medical conditions and care received differ across hospitals. Administrative data are also limited in its ability to monitor adverse events, elucidate temporal aspects of care, and distinguish preexisting comorbidities from complications resulting from care. Finally, the indicators do not account for differences in the environmental conditions that exist outside the healthcare system, such as sociodemographics or patient preferences. Nonetheless, the unique features of the AHRQ QIs are a useful resource for identifying quality concerns in healthcare at the hospital, community, state, and national levels.

Operated and maintained by AHRQ's Center for Organization and Delivery Studies and the AHRQ QI development team at the University of California at San Francisco's Evidence-Based Practice Center, downloadable AHRQ QIs are accompanied by available software, reporting tools, and technical assistance for research in quality tracking, improvement, comparative analyses, and public reporting.

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See also Agency for Healthcare Research and Quality (AHRQ); Data Sources in Conducting Health Services Research; Hospitals; National Association of Health

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HEALTHCARE EFFECTIVENESS DATA AND INFORMATION SET (HEDIS)

The Healthcare Effectiveness Data and Information Set, more commonly called HEDIS, consists of compiled reports from managed-care organizations concerning their health plan performance on a broad range of clinical and nonclinical measures. The National Committee for Quality Assurance (NCQA) developed and released the initial version of the measures in 1993. Although most participation in HEDIS is voluntary, more than 90% of U.S. health plans submit HEDIS data, in part to increase their competitiveness but

also, often, as part of accreditation or certification activities. Health services researchers also use HEDIS measures to conduct studies of the access, cost, quality, and outcome of care.

HEDIS measures are divided into eight categories: (1) effectiveness of care, (2) access to and availability of care, (3) satisfaction with the experience of care, (4) use of services, (5) cost of care, (6) health plan descriptive information, (7) health plan stability, and (8) informed-care choices. Of these, effectiveness of care is the largest category and includes measures dealing with highly specific standards of care such as appropriate medication for asthma patients and the use of medical-imaging studies for lower-back pain. Measures in other categories evaluate other aspects of patients' experiences (e.g., the number of customer service calls abandoned) and the business aspects of the health plans (e.g., financial stability). Over time, HEDIS has evolved to meet changing standards of healthcare and in response to regulatory changes, and NCQA now publishes changes to HEDIS measures on an annual basis.

Development and Evaluation of HEDIS Measures

NCQA uses an ongoing process to develop new HEDIS measures, evaluate existing ones, and retire those that have outlived their usefulness. Proposals for new measures first are examined through expert Measurement Advisory Panels (MAPs) tasked with evaluating them using three criteria: (1) relevance (e.g., health importance, cost-effectiveness, and potential for improvement); (2) feasibility (e.g., cost and ability to be audited); and (3) scientific soundness (e.g., basis in evidence and reproducibility). Once approved by an MAP, the proposed measures move through a process of technical development and field testing before being released for public comment. Measures subsequently reviewed and accepted by NCQA's Committee on Performance Measurement (CPM) are added as first-year measures in the new HEDIS set. NCQA does not provide public reporting on new measures during their first-year status, allowing time for reporting organizations to evaluate the initial results and address any technical issues. In subsequent years, MAPs evaluate the measures

under a continuous improvement process, which may result in their alteration or removal from the HEDIS set.

New Measurement Controversies

Although NCQA earns broad respect for its measurements, its processes sometimes draw criticism. For example, the 2006 addition to HEDIS (after 5 years of debate) of specific blood pressure and glycemic-control outcome benchmarks for patients with diabetes mellitus met with resistance from some areas of the medical establishment. Most clinical HEDIS measures focus on process rather than clinical benchmarks: Some felt that adding such specific measurements failed to adequately account for comorbidities and other individual patient variations.

Uses of NCQA's Published HEDIS Reports

NCQA makes HEDIS information available in a variety of forms to meet the needs and goals of its constituencies, chiefly accreditation and certification activities, delivering information to organizational purchasers of health plans, and delivering information to healthcare consumers.

Accreditation and Certification

NCQA uses HEDIS reports in many of its national accreditation and certification programs, notably for managed-care organizations, managed-behavioral-healthcare organizations, and preferred provider organizations (PPOs).

Nationally, the federal Centers for Medicare and Medicaid Services (CMS) require HEDIS reporting from all health plans seeking certification as providers for Medicare parts C (Medicare Advantage) and D (prescription drug coverage). Similarly, many states require HEDIS reporting from health plans seeking certification as Medicaid health maintenance organizations (HMOs). A few HEDIS measures only apply to plans serving Medicare or Medicaid patients (e.g., glaucoma screening in older adults is collected from Medicare plans only). Conversely, Medicare and Medicaid plans do not submit data on some measures (e.g., those evaluating clinical services not covered by Medicare).

Organizational Purchasers of Health Plans

NCQA publishes *Quality Compass* as a database-driven tool for organizational purchasers of health plans to use when evaluating competitive products, including cost and member satisfaction information. *Quality Compass* includes data from both commercial plans and Medicaid plans.

NCQA also offers a Web-based Quality Dividend Calculator, enabling commercial health plan purchasers to explore how the quality of differing health plans interacts with factors such as workforce demographics, type of industry, and number of provided sick days to predict the total impact of health plan selection on costs.

Consumer Information

On its own, NCQA uses HEDIS data to construct health plan report cards for use by consumers in making individual choices about insurance. However, NCQA's published HEDIS reports also form the basis for many tools and publications offered by employers; local, state, and federal government agencies; and the annual health plan rankings presented in *U.S. News and World Reports*.

Other Uses of HEDIS Measures

Although NCQA's data collection and reporting remain the primary uses for HEDIS measures, an indication of their general acceptance lies in their application for non-NCQA purposes, primarily in healthcare research and incentive programs.

Research

The advent and standardization of HEDIS measures has had two substantial impacts on healthcare research in addition to the quality assessments performed by NCQA. First, the HEDIS measures provide universally understood and widely accepted standards that researchers can use as benchmarks when studying the effectiveness of new or modified clinical interventions. Second, researchers can use these agreed-on benchmarks as the basis for evaluating nonclinical changes to healthcare delivery, such as those affecting patterns of use, reimbursement rates, or covered services.

Incentive Programs

Increasingly, managed-care organizations are implementing physician performance incentive programs as one of their initiatives to increase the quality of healthcare. Although different strategies for measuring performance exist, applying HEDIS measures has emerged as one of the more popular and effective means for incentivizing physician performance. For example, a study of physicians in Massachusetts found that using HEDIS measures produced performance improvements and that physicians were more likely to respond positively to evaluation systems based on HEDIS measures.

Future Implications

From its origins as a tool for competitive analysis and accreditation, HEDIS has evolved to become the gold standard of health plan quality evaluation. Given the current configuration of the U.S. healthcare system, NCQA will likely continue expanding its reach with new products and publications using HEDIS data to inform health plan selection. At the same time, with the current emphasis on healthcare quality improvement, HEDIS will likely provide the basis for an expanding array of performance initiatives.

However, in the event of substantive changes to the U.S. healthcare system, HEDIS may play an even more important role. First, in any national, healthcare reform movement that mandates individual health insurance, NCQA is well positioned to make HEDIS the foundation of a national, selection mechanism, and most managed-care organizations will likely participate because of increased competition. Second, former senator Tom Daschle and others have recently proposed the establishment of a nonpartisan, federal, healthcare board, combining aspects of the Federal Reserve Board and the defunct Office of Technology Assessment to create national standards for healthcare and health coverage. If HEDIS measures are used for some of its initial standards, NCQA might play a critical role in evaluating compliance with the new body's recommendations and rules.

Jason Rothstein

See also Competition in Healthcare; Health Report Cards; Managed Care; National Committee for Quality Assurance (NCQA); Outcomes Movement; Pay-for-Performance; Quality Indicators; Quality of Healthcare

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Web Sites

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<http://www.cms.hhs.gov>
- National Association for Healthcare Quality (NAHQ):
<http://www.nahq.org>
- National Committee for Quality Assurance (NCQA):
<http://www.ncqa.org>

HEALTHCARE FINANCIAL MANAGEMENT

The purpose of healthcare financial management is to provide both accounting and finance information that will assist healthcare managers in accomplishing the organization's purposes. There are no licensure requirements to be a practicing healthcare financial manager. Facility-accrediting

organizations, such as the Joint Commission, rarely provide requirements for healthcare financial managers but, instead, hold the organization's chief executive officer (CEO) responsible for its financial management. Formal, educational programs for healthcare financial management are not common and usually exist as postgraduate certificate programs. The chief financial officers (CFOs) of most large healthcare organizations possess a master's degree in business administration, a bachelor's degree in accounting, a certificate in public accounting, and have healthcare experience. For formal, continuing education and certification in healthcare financial management, managers can obtain membership and certification in healthcare professional associations such as the Healthcare Financial Management Association (HFMA).

General Functions

Healthcare financial management applies accounting and finance functions to healthcare organizations. It is a broad-based field, drawing from several disciplines and adapting to incorporate current trends.

Accounting

Accounting is generally divided into two major areas: financial accounting and managerial accounting. The purpose of financial accounting is to provide accounting information, generally historic in nature, to external users, including owners, lenders, suppliers, the government, and other insurers. Accounting information prepared for external use must follow the formats established by the American Institute of Certified Public Accountants (AICPA) and other similar organizations and must also follow the generally accepted accounting principles used for standardization. The 1996 *AICPA Audit and Accounting Guide for Health Care Organizations* established four basic financial statements that hospitals should prepare for external use: (1) a consolidated balance sheet, (2) a statement of operations, (3) a statement of changes in equity, and (4) a statement of cash flows. A new audit guide by AICPA was published in 2008. The new audit guide includes revenue recognition criteria, including the (a) accounting and disclosures for charity care and other uncompensated care,

(b) illustrative financial statement disclosures of activity for settlements due to or paid from third parties, (c) physician loans and guarantees, (d) affiliated receivables when collection is doubtful, (e) joint-operating agreements between not-for-profit healthcare organizations, (f) transfers of liabilities or net assets between unrelated not-for-profit organizations, (g) a separate guide for continuing-care retirement communities, (h) malpractice and insurance liabilities, (i) contributions and pledges, and (j) auditor association with cost reports.

The purpose of managerial accounting is to provide accounting information—generally, current or prospective in nature—to internal users, including managers. Such accounting information supports the planning and control management functions. In this way, managerial accounting is the link between financial accounting and the manager, and it, therefore, relies on the information provided by financial accounting. Managerial accounting, or accounting information prepared for internal use, requires no prescribed format and, therefore, varies greatly among organizations. Managerial accounting topics, such as budgeting and inventory control, require a knowledge of economics, statistics, and operations research.

Many managerial accountants believe that cost accounting, which is the study of costs, including methods for classifying, allocating, and identifying costs, is either synonymous with or a subset of managerial accounting. Some argue, however, that cost accounting includes all managerial accounting and also requires some financial accounting. Cost accounting and managerial accounting include topics that could be considered part of finance as well.

Finance

Historically, the purpose of finance has been to borrow and invest the funds necessary for the organization to accomplish its purpose. Today, the purpose of finance is to analyze the information provided by managerial accounting to evaluate past decisions and make sound decisions regarding the future of the organization. It uses techniques such as ratio analysis and capital analysis and requires knowledge of financial and managerial accounting, economics, statistics, and operations research.

Major Objectives

The purpose of healthcare financial management is to provide accounting and finance information that can assist healthcare management in accomplishing all the organization's varied objectives. Yet all organizations have at least one objective in common: to survive and grow. Organizations in other industries might refer to this as "maximizing the owners' wealth"; healthcare organizations typically refer to this as "maintaining community services." In either case, the organization will be of little use if it cannot afford to continue to operate. Therefore, the most important objective of healthcare financial management is to generate a reasonable net income (i.e., the difference between collected revenue and expenses) by investing in assets and putting the assets to work.

In addition to generating income, another major objective of financial management in healthcare is to respond to the regulations of the federal, state, and local governments. Because healthcare organizations are in a position to take unfair advantage of the sick and the elderly, regulation of the industry serves to protect individuals who cannot protect themselves. Government funding pays more than 45% of all healthcare bills and therefore has a vested interest in ensuring that the money is well spent. Healthcare organizations must also meet quasi-regulations in the form of accreditation or certification standards to qualify for reimbursement from many third-party payers and to qualify for loans from certain lenders. Therefore, the second objective of healthcare financial management is to respond to the myriad regulations in a timely and cost-effective manner.

The third objective of healthcare financial management is to facilitate the organization's relationship with third-party payers, who are agents of the patient who have agreed to pay all or a portion of the patient's bill. Third-party payers account for more than 81% of a healthcare organization's operating revenues. Financial management must be responsive to third-party payers and, in many ways, must treat them as customers—in the economic sense of the word—because the third party pays the patient's bill. At the same time, financial management must be attentive to the patient as the customer—in the service sense of the word—because the patient has influence over the third-party

payer and in some cases may be partially responsible for his or her bill.

The fourth objective of healthcare financial management is to influence the method and amount of payment chosen by third-party payers. Third-party payers are becoming increasingly aggressive in asking healthcare organizations for discounts if they represent large numbers of patients. In certain cases, healthcare organizations are discounting prices below cost to maintain their market share. Some third-party payers, such as Medicare, are asking healthcare organizations to assume part of the financial risk for the patient by agreeing to a *prospective payment*, that is, agreeing in advance to a price for providing care to the patient. Healthcare organizations lose money if they provide care that costs more than the prospective payment. Some third-party payers are asking healthcare organizations to assume substantial risk by agreeing to a *capitated price*, that is, a price per subscriber, before the subscriber actually needs care. Capitated prices put healthcare organizations at risk for the cost of care, if needed, and the extent of the use of care by the subscriber.

Healthcare financial management also strives to monitor physicians and their potential financial liability to the organization in terms of their ordering patterns and their possible negligence. In 2005, physicians and other professionals accounted for 31% of all healthcare spending in the nation, hospitals were responsible for 31%, and nursing homes accounted for 6%. Physicians, however, influence much of the healthcare spending attributable to hospitals and nursing homes. For example, physicians order the patient's admission, diagnostic testing and treatment, and discharge. Healthcare financial management must ensure—through the utilization review process—that physician-ordering patterns are consistent with what the patient needs. Regarding the possibility of physician negligence, healthcare financial management must ensure—through the credentialing process and the risk management process—that the healthcare organization has minimized its exposure to legal liability for the physician's possible, negligent actions.

The sixth major objective of healthcare financial management is to protect the organization's tax status. For-profit healthcare organizations seek ways of reducing their tax liability, and not-for-profit healthcare organizations seek ways of

protecting their tax-exempt status from the attempts of state and local governments to find new revenue sources. The more difficult objective rests with the not-for-profit organizations because most healthcare organizations are not for profit and corporate, tax-exempt status has come under increasing judicial and public scrutiny.

Value of Healthcare Financial Management

Healthcare financial management provides accounting information and financial techniques that allow managers to perform management functions and management connective processes; it, therefore, helps accomplish the organizational objectives. In addition to this important indirect value, healthcare financial management has a direct value in the performance of the management functions and management connective processes.

Management Functions

Healthcare financial management assists an organization in accomplishing its mission and goals through planning, organizing, appropriately staffing, motivating, and controlling the budget.

After the governing body completes the strategic plan and senior management completes the operating plan, financial management is often responsible for completing the operating budget and capital budget. The operating budget often provides the incentives to plan properly.

Financial management provides a chart of accounts, based on the organizational chart, that identifies revenue centers and cost centers. Together with the organizational chart, this provides the basis for *responsibility accounting*, that is, holding department managers responsible for their revenues and expenses.

Financial management often staffs a variety of departments and processes important to the healthcare organization. Departments such as medical records and information systems are currently being placed under the supervision of financial management, in addition to departments such as accounting, admitting, and materials management, which have been traditionally under financial management. The increasing importance of non-traditional departments in the billing process appears to justify this trend.

Also known as *motivating* and *influencing*, directing provides financial management with the opportunity to use both rewards and penalties to accomplish the organization's purposes.

The responsibility that is, perhaps, closest to the overall function of financial management—the control of the budget, financial reports, financial policies and procedures, and financial audits—allows financial management to monitor performance and take the appropriate corrective action when performance is unsatisfactory.

These management functions mean little without the *management connective processes* to integrate them.

Management Connective Processes

The connective processes of communicating and coordinating are important to financial management for both reporting and advising. Also important is coordinating the relationships between, for example, revenue and expenses, capital budgets and operating budgets, and volumes and prices and collected revenues.

Decision making is important to financial management as a direct measure of quality. Governing boards, CEOs, and outside sources (e.g., independent auditors) often judge the quality of financial management based on the decisions and recommendations made by financial management. The advantage of this view of quality is that it assumes rational decision making. Decisions made in healthcare financial management are often based on politics or other criteria that are unknown to the evaluator of the decision. Therefore, a decision may be evaluated as *bad* based on the known facts, but it may be evaluated as *good* based on other criteria unknown to the evaluator.

Effects of Financial Management on Changing Healthcare

One widespread view holds that financial management is the most important predictor of whether healthcare organizations will survive in the current competitive climate and beyond. According to one author, the healthcare industry entered an economic depression in the early 1990s that lasted through 2005. As in all depressions, the healthcare

depression was characterized by rapidly falling prices; restrictions on credit, including downgraded credit ratings; reduced production; numerous bankruptcies, mergers, and acquisitions; and high unemployment. Although this conclusion is not comforting, it points out that healthcare is one of several industries that society has allowed to grow beyond the industry's ability to produce efficiently. The same type of growth followed by depression occurred in agriculture during the 1970s and in oil and financial services during the 1980s; it is predicted that depression in government and education will follow the depression in the healthcare industry.

Regarding bankruptcies, the most notorious bankruptcy in not-for-profit healthcare history was the Allegheny Health Education and Research Foundation (AHERF), which occurred in 1998. The AHERF was a 14-hospital system in Pennsylvania. The AHERF bankruptcy had a chilling effect on bond ratings for most not-for-profit healthcare organizations.

There is significant evidence that the peak of the economic depression was in the late 1990s and that the healthcare industry is on the upside of economic recovery. The percent increase in hospital prices has risen steadily since its low in 1997; hospital outpatient prices have risen an average of 6.75% through 2004, and hospital inpatient prices have risen an average of 5.56% through 2004. Another indication of economic recovery is hospital merger activity, which generally continues to decline with 142 reported in 1999 compared with only 50 mergers in 2005. Most of the mergers were driven by a desire to consolidate operations, thus improving efficiency rather than financial distress.

Future Implications

Healthcare financial management will continue to evolve in the future along with the ongoing changes in government healthcare policies. The government and private insurers will increasingly demand greater accountability from healthcare organizations. Well-managed healthcare organizations will survive, and financial management will be instrumental to their survival.

Richard L. Clarke

See also Centers for Medicare and Medicaid Services (CMS); For-Profit Versus Not-for-Profit Healthcare; Healthcare Financial Management Association (HFMA); Medicaid; Medicare; Nonprofit Healthcare Organizations; Payment Mechanisms

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Web Sites

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- Centers for Medicare and Medicaid Services (CMS): <http://www.cms.hhs.gov>
- Healthcare Financial Management Association (HFMA): <http://www.hfma.org>
- National Association of Health Underwriters (NAHU): <http://www.nahu.org>
- U.S. Securities and Exchange Commission (SEC) for Publicly Traded Healthcare Companies: <http://www.sec.gov/edgar.shtml>

HEALTHCARE FINANCIAL MANAGEMENT ASSOCIATION (HFMA)

Founded as the American Association of Hospital Accountants in 1946, the Healthcare Financial Management Association (HFMA) is a membership organization for healthcare management executives and leaders. With more than 34,000 members, ranging from chief financial officers to accountants, HFMA is a leader on the major financial trends and issues facing the nation's healthcare industry. Its members are found in all areas of healthcare, including hospitals, managed-care organizations, physician practices, accounting firms, and insurance companies.

At the chapter, regional, and national levels, the HFMA helps healthcare finance professionals meet the challenges of the ever-changing healthcare environment by (a) providing education, analysis, and guidance; (b) building and supporting coalitions with other healthcare associations to ensure accurate representation of the healthcare finance profession; (c) educating a broad spectrum of key, industry decision makers on the intricacies and realities of maintaining fiscally healthy healthcare organizations; and (d) working with a broad cross-section of stakeholders to improve the healthcare industry by identifying and bridging gaps in knowledge, best practices, and standards.

Chapter Management

The HFMA, which is headquartered in Westchester, Illinois, comprises 11 geographic regions and 68 local chapters. The local chapters are where most HFMA members make their first networking connections. Local chapters are the source for much of the guidance and support members seek and receive. And chapter leadership often is a steppingstone to national leadership. Most chapters, either individually or jointly, hold annual events designed to promote educational, career, and networking opportunities for their chapter members.

Educational Opportunities

Through national and chapter programs, HFMA annually offers its members more than 465,000 educational hours. Educational opportunities range from traditional seminars and conferences to audio Webcasts, e-learning courses, targeted forums, and communities of practice.

Traditional Education Activities

The centerpiece of HFMA's educational offerings is its Annual National Institute (ANI). Held annually in June, the ANI offers more than 80 educational sessions, keynote addresses from industry leaders, and an opportunity to network with more than 4,000 healthcare professionals in a relaxed yet focused environment. In addition, HFMA holds annual Executive Summit and Revenue Cycle Strategies Conferences.

Alternative Learning Activities

HFMA's audio Webcasts offer a convenient way for members to obtain information on healthcare finance topics. HFMA offers on-site, educational training. And e-learning offers more than 700 Web-based training courses, including avoiding claims denials, claims denial management, finance, billing, and cost control.

Career Development

HFMA offers a variety of resources to assist its members in developing their careers. Members can receive HFMA's free, biweekly newsletter, *Career Opportunities*; access free career advice; and view job openings nationwide through the HFMA job bank.

Certification Programs

Healthcare finance professionals seeking to prepare for increasingly responsible positions can complete one of HFMA's certification programs. HFMA offers certification in the designations of Certified Healthcare Financial Professional (CHFP) and Fellow of the Healthcare Financial Management Association (FHFMA). Achieving these designations

helps prepare for and demonstrate dedication to professional development.

Vendor Resources and the Peer Review Process

HFMA offers healthcare industry vendors numerous sponsorship, advertising, and exhibitor opportunities. Vendors can also have products and services reviewed through HFMA's peer review process. The peer review process is designed to provide healthcare financial managers with an objective, third-party evaluation of products and services used in the healthcare finance workplace. Peer review consists of a rigorous review by a peer review panel consisting of current customers, prospects who have not made a purchase, and HFMA members. After successfully completing the process, vendors may use a "Peer Reviewed by HFMA" mark to communicate their involvement to potential customers.

HFMA's Statements

Vision

HFMA's vision is "to be an indispensable resource for healthcare finance."

Purpose Statement

HFMA's purpose is to define, realize, and advance the financial management of healthcare by helping members and others improve the business performance of organizations operating in or serving the healthcare field.

Quality Statement

Quality is the foundation of the association and the keystone of its efforts to ensure member and customer satisfaction. HFMA's objective is to (a) consistently provide services and products that meet the quality expectations of its members, customers, and employees; (b) actively pursue a program of continuous quality improvement that enables employees and volunteers to do their jobs right the first time; (c) make quality a major, strategic association goal, lying at the heart of everything done for members

and customers; and (d) strive continually to improve the quality of services and products offered, the processes and procedures used to produce them, and the manner in which they are delivered.

Values Statement

HFMA believes (a) that service to members is our highest priority, (b) in excellence in all that we do, (c) that teamwork is essential in meeting the objectives of the association, (d) in the importance of individuals, (e) in encouraging innovation and creativity, and (f) in conducting the association with financial responsibility and a prudent approach to business.

Code of Ethics

Members of HFMA agree to endeavor to promote the highest standards of professional conduct by practicing honesty and maintaining personal integrity, including (a) avoidance of conflicts of interest with those of their employer or the HFMA; (b) striving for the objective and fair presentation of financial information; (c) fostering excellence in healthcare financial management by keeping abreast of pertinent issues; (d) maintaining the confidentiality of privileged information; (e) promoting a greater understanding of financial management issues by others in the healthcare field, and seeking increased public understanding through communication about such issues; and (f) seeking to maintain a reasonable balance between the quality and cost of healthcare.

Diversity

HFMA values and respects diversity. Individual differences are viewed as assets that promote the growth and success of HFMA and its members. In principle and in practice, HFMA encourages and supports diverse individual viewpoints and contributions. HFMA believes that a diverse membership is a quality membership.

Richard L. Clarke

See also Centers for Medicare and Medicaid Services (CMS); Healthcare Financial Management; Medicaid; Medicare; Payment Mechanisms

Further Readings

Healthcare Financial Management (monthly magazine)
Healthcare Financial Management Association
newsletters: *Business of Caring*, *Patient Friendly Billing*, *Revenue Cycle Strategist*, *Strategic Financial Planning*, *Supply Chain Solutions*

Web Sites

Healthcare Financial Management Association (HFMA):
<http://www.hfma.org>
Patient Friendly Billing Project: <http://www.hfma.org/library/revenue/PatientFriendlyBilling>

HEALTHCARE INFORMATICS RESEARCH

Healthcare informatics is a specialty area that integrates health science, computer science, information science, decision science, and management science to manage and communicate data, information, and knowledge in healthcare practice and management. In addition, healthcare informatics facilitates the integration of data, information, and knowledge to support patients, providers, and healthcare executives in their decision making in all roles and settings. Specifically, healthcare informatics research can be defined as a systematic process of compiling, analyzing, and simulating data to produce verified and replicated findings from observed facts or phenomena.

Analytical Strategies

The analytical strategies of healthcare informatics research are shown in Figure 1. The specific strategies include the formulation of a data warehouse, data mining, the application of confirmatory statistical analysis, simulation and optimization via an interface with computer and information system technologies, and translational research.

Data Warehousing

Data warehousing is the systematic structuring of data in a theoretically informed framework

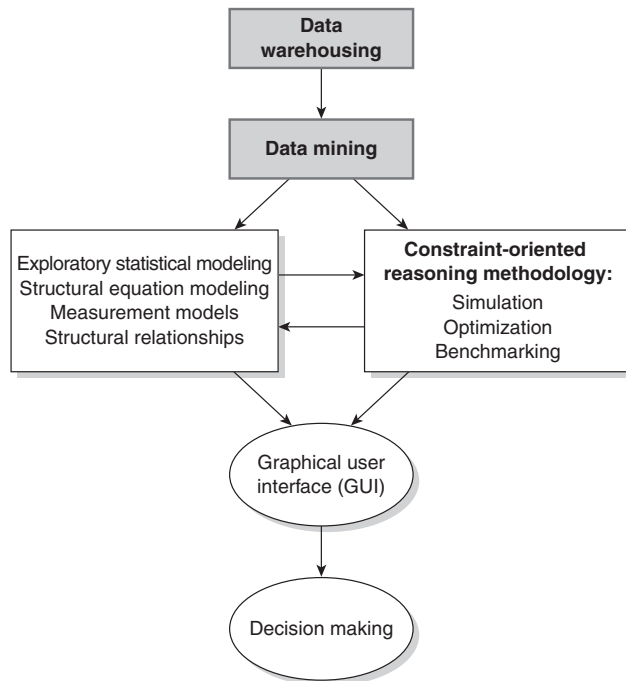


Figure 1 Analytical Strategies for Healthcare Informatics Research

Source: Adapted from T. T. H. Wan's "Healthcare Informatics Research," *Journal of Medical Systems* 30(1): 3-7, 2006.

shared by the disciplinary focus as a means to produce useful information for exploration. Analysts extract data from multiple sources; build a relational database, which is continuously maintained and updated; and classify and populate the study variables uniformly under a nosological or other classification system. A more current approach to data structuring is the reliance on a data-sharing design that enables the functioning of a pooling or pushing data system from multiple sources or units of healthcare organizations. Personal identifiers are, generally, encrypted to ensure the confidentiality and security of the shared data.

Data Mining

Data mining is the use of myriad exploratory and confirmatory statistical techniques to translate masses of raw data into valuable information for managerial decision makers. The benefits of data mining include understanding the patterns of

care or services, identifying causal paths or root causes for problems in service delivery, profiling best practice models, establishing benchmarks for continuous performance enhancement, and differentiating the mechanisms for achieving high performance in a healthcare delivery system.

Confirmatory Statistical Analysis

Confirmatory statistical analysis is the application of multivariate, statistical methods, such as structural equation modeling, to validate or confirm a theoretically constructed model. This modeling approach often involves latent variables, particularly those related to perceptions of health and the quality of care. Thus, the measurement model of the theoretical constructs is designed and evaluated to determine the validity and reliability of the measurement instrument used. Then, functional or causal relationships among the study variables are evaluated using a structural equation model to determine its goodness of fit to the data gathered from the field study. Relevant examples include nursing home quality measurement, patient care outcomes, information technology application, system integration, and hospital performance.

Simulation and Optimization Methods

Simulation and optimization methods play an important role in healthcare research regarding organizational performance, through which researchers develop interfaces between analytical modeling and operations research. For instance, the application of the data envelopment analysis (DEA) to identify the best practice in community health centers can suggest avenues for improving the centers' productivity and performance. The application of tabletop exercises to simulate disaster management and planning is another germane example. Graphical user interface (GUI) presentations should be developed so that simulated results can guide managerial and constructional decision making.

Translational Research

Translational research plays an important role in converting scientific knowledge into routine practices in the design and evaluation of healthcare

management interventions. With the aide of information and communication technology, practitioners, healthcare executives, and decision makers can rely on evidence-based knowledge to improve the effectiveness of health management interventions.

The most important use of information and communication technology is to enhance patient-centric care so that the quality of healthcare organizations can be improved and sustained. The national Institute of Medicine's (IOM's) Committee on Crossing the Quality Chasm: Next Steps Toward a New Health Care System strongly advocates that, at the point of care, the clinician and patient should review the results of the care the patient has received and then use scientific knowledge to decide together on continuing care.

Significance

The nation's healthcare system is evolving in such a way that good evidence is both available and actually used to stimulate effective performance by healthcare executives. The healthcare system's performance can benefit by integrating multidisciplinary perspectives to generate evidence-based knowledge and decision support modeling. Thus, organizational performance at both the patient care and management levels can be improved. The significance of healthcare informatics research has been highlighted in numerous proceedings published by the American Medical Informatics Association (AMIA) and the International Medical Informatics Association (IMIA). The knowledge generated and transformed by healthcare informatics research can be greatly enhanced by the effective use of information and communication technologies.

There are limited interdisciplinary training programs focusing on healthcare informatics in the United States. The National Committee on Vital and Health Statistics (NCVHS), public advisory body to the secretary of the U.S. Department of Health and Human Services (HHS), suggests that a significant amount of investment is needed to build a solid healthcare information infrastructure and to train a corps of health informatics professionals. The U.S. Congress is considering the appropriation of funds for training and research in healthcare informatics under the auspices of the National Science Foundation (NSF).

The Evidence-Based Modeling Approach

The field of evidence-based informatics is defined as the study of information science applications in the context of healthcare management to compile, manage, and process data and knowledge for improving the performance of healthcare organizations. The process of evidence-based, healthcare management modeling and simulation is presented in Figure 2. Specifically, the process begins with a formulation of the study problem that is guided by a theoretically informed framework to specify the interrelationships among the study variables. The analytical model is then specified and subsequently built iteratively with testable hypotheses.

This approach can be used as the basis for designing an empirical study that can, in effect, serve as a launching point for constructing confirmatory statistical models in which the measurement model and the causal models could be fully developed and validated. The validated or verified results form the foundation and constraints for simulation and multivariate optimization modeling. Thus, a decision support system for managerial operations can be formulated and further tested. The simulation is run and evaluated as a valid representation of the real-world system.

Upon completion of this validation, the simulation model may then be used to assess the real-world system and prescribe the implementations for the desired effects for improving the performance of healthcare organizations. In this case, the injection of artificial data emulating changes in input variables into the simulation that has been validated as predictive of better performance is used to guide the healthcare executives' decisions for performance enhancement. Empirical examples illustrating the intricacies of applied healthcare informatics research in optimizing inputs to achieve better outputs can be found in nursing home management research, nursing care staffing, and information system integration.

Future Implications

It is widely recognized that healthcare management technology is underused and underdeveloped. To achieve improvements in access, cost, and quality of care, patient-centric, information

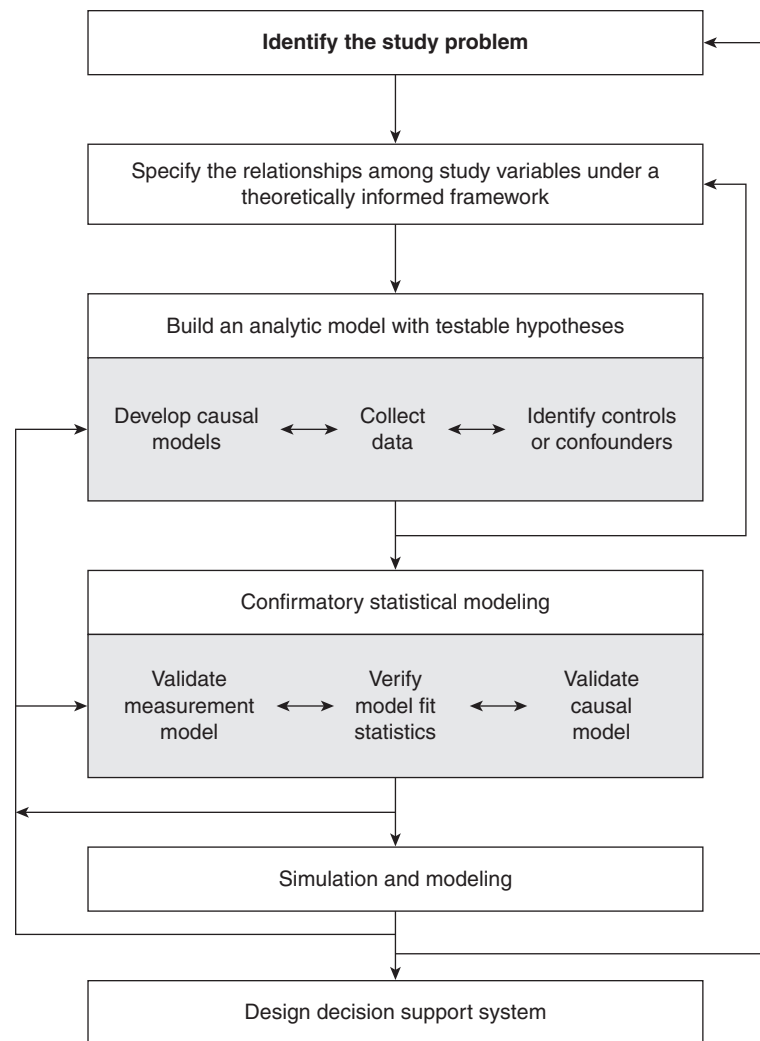


Figure 2 Evidence-Based Modeling Approach in Healthcare Informatics

technology-based networks should be built to provide vital, medical information at the point of care to enhance patient care outcomes. Although the establishment of empirical research on healthcare management is timely, the future of healthcare informatics research and development relies on the application of knowledge to actual practices. For instance, translational research should generate evidence-based knowledge to guide the development and implementation of consumer-oriented health information technology that could be embedded in handheld devices (e.g., an iPhone). Research activities using massive amounts of clinical and administrative data should be promoted.

Another important step forward would be achieving a clearer and improved understanding of

the effects of clinical and managerial interventions on patient care outcomes through the development of evidence-based decision support systems for optimizing the performance of healthcare organizations. Currently, the field of healthcare informatics plays an important role in establishing knowledge management applications and information technology services. This role will likely broaden and greatly increase in importance in the future.

Thomas T. H. Wan and Keon-Hyung Lee

See also Clinical Decision Support; Computers; Data Privacy; Data Security; Data Sources in Conducting Health Services Research; Health Communication; Health Informatics; Health Insurance Portability and Accountability Act of 1996 (HIPAA)

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<http://www.amia.org>
- Centers for Disease Control and Prevention, National Center for Public Health Informatics (NCPHI):
<http://www.cdc.gov/ncphi>
- International Medical Informatics Association (IMIA):
<http://www.imia.org>

HEALTHCARE MARKETS

Healthcare markets define the set of consumers and producers that influence healthcare price and quality. Market definitions are of tremendous policy importance and have been studied extensively. These definitions have, for example, been crucial to understanding the relationship between competition and both financial and health outcomes. Understanding medical expenditure growth

and the diffusion of new technologies similarly depends on defining markets.

Although definitions vary across services, there are efforts to define healthcare provider markets on a national basis. Health Service Areas (HSAs), for example, describe the geographic area from which an individual hospital's patients originate. Similarly, Health Referral Regions (HRRs) define the larger geographic area from which patients travel for tertiary medical care (e.g., cardiac surgery). This distinction illustrates the point that healthcare markets are not uniform; rather, they depend on specific clinical services, not to mention clinical quality, and even intangibles such as bedside manner.

Although research on healthcare markets encompasses a broad literature, the following sections on hospital and pharmaceutical markets illustrate key concepts.

Hospital Markets

Hospital markets are among the most studied in health services research. As with much of healthcare, hospital markets are wrought with complexity. Insurers, for example, form networks of covered hospitals and physicians. Insurers heavily influence consumers' prices and thus influence hospital markets. Furthermore, hospitals are differentiated in both service mix and quality. Each of these factors plays a role in defining provider markets in general and hospital markets in particular.

Historically, regulatory concerns such as anti-trust laws have driven hospital market definitions. In theory, markets are the smallest group of products and the smallest geographic area in which a hypothetical monopolist could impose a small but significant nontransitory price increase (SNPI). Both the U.S. Department of Justice and the Federal Trade Commission define an SNPI as a 5% price increase. A single hospital may, of course, face different markets for different services.

In practice, hospital markets have been difficult to define. Initial efforts defined markets as a fixed radius (e.g., 15 miles) about a hospital. Fixed distances were often determined by the distance referring physicians would regularly drive to see patients. A natural alternative has been to use urbanized areas, such as metropolitan statistical areas (MSAs). Although these ad hoc definitions may be reasonable

proxies for markets, they are undoubtedly imperfect. Furthermore, analyses of markets may differ based on how they are defined.

Subsequent research used patient flow data to define markets. Examples include the aforementioned HSAs and HRRs. Markets were, essentially, defined as the geographic areas (i.e., 5-digit zip codes) from which their patients originated. Although appealing, patient flow data may underestimate the true market size by excluding patients who might otherwise choose a given hospital were its quality higher or prices lower. Conversely, such data may overestimate the market size if some patients are willing to travel long distances to reach a specific hospital. This might occur if patients are aware of hospital quality, a factor that is unaccounted for in market definitions.

Recent studies have recognized that hospitals compete not only for patients but also for insurance network inclusion. Empirical work in this literature builds on patient flow data by modeling individual patient's hospital choices. To date, these studies indicate that actual markets are effectively smaller than those suggested by raw patient flow data. These findings suggest that consumers' choices are heavily influenced by factors unobserved by researchers.

The basic principles underlying hospital market definitions likely apply to other healthcare providers as well. The markets for most providers, such as physicians and long-term care facilities, are defined by a geographic area and a clinical specialty or focus. Furthermore, insurers typically play a crucial role in forming a set of competing providers.

Pharmaceutical Markets

Pharmaceutical markets are drastically different from healthcare provider markets. These markets are characterized by tremendous research and development (R&D) costs, often exceeding \$1 billion per new product. Patents, a government sanctioned monopoly right, are issued as an incentive to firms to make R&D investments. Typically, a pharmaceutical firm is guaranteed exclusive rights to market a new chemical entity for the patent's term—that is, 20 years from the filing date.

Pharmaceutical markets comprise drugs that treat the same condition; these drugs form a *therapeutic*

category. Although there is no single universally accepted set of therapeutic categories, the intuition is clear: Cardiac drugs, for example, might be part of one market, whereas asthma drugs are part of another. Naturally, these categories may be further refined: Cardiac drugs, for example, could be subdivided into arrhythmia and high cholesterol treatments.

While under patent protection, a drug's market includes therapeutic substitutes—chemically different products that treat the same condition. Subsequent to patent expiration, competitors are free to market chemically equivalent (i.e., generic) substitutes. Generic entry plays a crucial role in the definition and function of pharmaceutical markets.

As with other healthcare markets, insurance plays an important role. Insurers can influence pharmaceutical use by effectively setting the drug prices for their beneficiaries. Insurers first define a *drug formulary*—that is, a set of drugs that are covered by the insurer. Conditional on drug formulary inclusion, insurers then set the prices paid by their beneficiaries, typically a copayment. Markets for Medicare beneficiaries, Medicaid recipients, and private insurance enrollees are typically distinct, with further subdivisions within each category.

From a geographic perspective, pharmaceutical markets are largely national, a marked difference from healthcare provider markets. Pharmaceutical markets are, however, differentiated across nations. Prices, for example, are typically much higher in affluent nations than in less advantaged nations. Two policy initiatives threaten to undermine these differences. *International reference pricing*, often used by European nations, sets one nation's price as a function of the prices used by other nations. Similarly, *reimportation* breaks down cross-nation price differences by allowing pharmaceuticals in one nation to be resold in another. Currently, reimportation is allowed within the European Union (EU) but banned between most other developed nations. These policies effectively lower prices for those who would otherwise pay the most. They may, however, raise prices for the relatively poor.

Future Implications

Further research is needed to understand the role of healthcare markets. Promising techniques from the hospital market literature hold the potential to

address many research and policy questions. Crucial questions regarding quality and competition, as well as the role of new technologies, remain to be addressed. Likewise, other markets, such as for physician services and medical devices, remain understudied.

Jeffrey S. McCullough

See also Antitrust Law; Competition in Healthcare; Health Economics; Health Insurance; Hospitals; Multihospital Healthcare Systems; Pharmaceutical Industry; Regulation

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HEALTHCARE ORGANIZATION THEORY

The scholarly field of organization studies and the empirical world of healthcare organizations have grown up together. Organizational concepts and

propositions have been applied to and tested in healthcare settings; healthcare organizations, which exhibit somewhat distinctive features, have posed special problems for researchers, who have contributed to the development of organization theory.

Background

Organization studies did not emerge as an academic discipline until the late 1950s; before that time, organizations were not very significant players in healthcare. Hospitals were the major organizational form, but most were small, nonprofit, "voluntary" structures closely connected to and embedded in the local communities they served. Physicians worked as independent professionals, billing individual clients for service, often on a sliding scale taking into account a client's ability to pay. Well into the 1950s, healthcare in the United States was a cottage industry—small in scale, decentralized, and locally governed. What structure there was came not from the government or from healthcare organizations but rather from the controls exercised by professional occupations—in particular, the American Medical Association (AMA).

Organization studies have evolved over time, moving from more micro to more macro forces and structures. Early students of organizations concentrated primarily on *organization behavior*—the behavior of individuals and groups operating within the context of an organization. Later students, during the 1960s, turned their attention to organizations as themselves objects of study, as collective actors varying in structure and operations. This work—including comparative organizational studies, the development of contingency theory, and transaction cost theory—emphasized the importance for an organization of the wider environment or context in which it was located. More recently, beginning during the mid-1970s, we witnessed the creation of a number of theoretical perspectives—resource dependence, population ecology, institutional theory—that examine the operation of larger systems of organizations, including organizational populations and organizational fields. The changing foci of scholarship are clearly reflected in the research on healthcare organizations.

Occupational Structure and Behavior Within Healthcare Organizations

The earliest studies of the organization of healthcare were conducted by students of occupations and professions. During the 1930s, scholars such as A. M. Carr-Saunders in England and Everett C. Hughes and Talcott Parsons in the United States began to examine the distinctive control systems devised by professional groups—in particular, physicians—to manage their work. Professional occupations sought control over the structure and activities of training systems through accreditation, and they fostered the creation of collegial controls both informal and formal, the latter exercised primarily through activities conducted by the professional associations. The backing of the government was secured to ensure that only licensed practitioners had access to specified titles, positions, and activities. During the 1950s and 1960s, important studies examined the structure, “power, purpose, and politics” of the AMA, which by that time had become one of the most powerful professional associations in the nation.

Gradually, scholars began to turn their attention to the interaction of occupations and organizations. Professionals were not only operating within and affected by their occupational associations but also by the organizational settings in which they increasingly trained and worked. During the early 1950s and 1960s, sociologists such as Everett C. Hughes, Howard S. Becker, and Robert K. Merton conducted insightful studies examining the nature of professional socialization and training in medical schools. How do medical students cope with the vast amount of material to be learned? How do they learn to conduct intimate physical examinations of patients or deal with pain, disability, and death? On what basis do they decide whether or not to specialize or choose which specialty to pursue?

Physicians are exposed to organizations not only in their training but, to an ever-increasing extent, in their practice settings as well. Until late in the 20th century, most physicians were solo practitioners, operating in small, private offices and looking after the health needs of their private patients. As studies by Oswald Hall during the 1940s revealed, ethnic and religious identification

were important factors in structuring a physician's location and mode of practice. Informal connections were important for obtaining patient referrals and appointment to hospitals' staffs. By the beginning of the 1950s, about 35% of physicians had moved into specialized practice, and physicians began to cluster in multispecialty, group practice settings. Studies by numerous scholars, including Joseph Ben-David, Eliot Freidson, and George Silver, examined the effects on physicians' behavior of differences in their practice settings. Such studies have, of course, become much more common as more and more physicians locate their practice in organizational settings. For example, James C. Robinson has recently examined the consequences for medical practice of variations in settings including “virtual” arrangements such as (a) Independent Practice Associations (IPAs), (b) multispecialty medical groups, (c) physician practice management systems, and (d) physician-hospital organizations. Such settings vary greatly along dimensions such as the ways in which incentives are structured, the extent to which physicians are colocated in the same work setting, the type of collegial controls exercised, and the nature and extent of managerial authority.

While physicians have received much attention in studies of healthcare organizations, an extensive body of research also exists on organizational factors affecting other types of professions, including nurses, chiropractors, pharmacists, and medical social workers.

Determinants and Consequences of Structures in Healthcare Organizations

Moving to the organizational level, far and away more scholarly attention has been devoted by organizational scholars to the study of hospitals than to any other type of organization. Informative historical investigations of changes in the nature of U.S. hospitals have been provided by Paul Starr, Rosemary Stevens, William D. White, and Charles E. Rosenberg, among others. In the early 20th century, hospitals were places where indigent patients went to die and where inquisitive physicians went to learn more about disease. However, aseptic procedures improved and medical care practice became more complex, requiring ever more expensive equipment, and by midcentury,

physicians had come to depend on hospitals for the care of their patients. Hospitals became indispensable to professional, medical practice, serving, in Herman Somers and Anne Somers's term, as "the doctor's workshop."

A Distinctive Structure

In the United States, physicians and hospitals have developed a unique structure. As Harvey Smith pointed out in 1955, American hospitals exhibited a "dual authority structure"—one administrative, the other professional. With only a few exceptions, such as pathologists, physicians did not become hospital employees. Rather, they organized themselves as a "medical staff" to exercise control over the care of their individual patients, whom they admitted for specialized treatment, as well as to govern their own members, through the formation of staff selection, tissue auditing, and other committees. Hospital administrators, rarely themselves physicians, were responsible for the oversight of the building, equipment, patient wards, housekeeping, and ancillary services. The patient received two bills: one for the hospital and the other for medical (physician's) services. The American model was exceptional: In Europe, hospitals were typically directed by physicians, employed a full-time staff of physicians, and were operated as public, not private, institutions.

In contrast to physicians, other U.S. healthcare professions—in particular, nurses and social workers—while granted circumscribed decision-making autonomy were subordinated to the administrative structure. A growing range of paraprofessionals—such as laboratory technicians, inhalation therapists, and radiological personnel—staffed hospital departments. All were subject to dual control: receiving orders and directions from physicians but being coordinated and routinely supervised by managerial personnel.

Not all organizational scholars focused their primary attention on the authority structure that had evolved in hospitals. Many conducted research in healthcare organizations to apply and test the general propositions emerging from organization theory. For example, Charles Perrow examined the way technological developments worked to shape the differentiation and structuring of hospitals as well as changing the power-dependence relations

between physicians and trustees. Other researchers, such as W. R. Scott and Ann B. Flood, examined structural sources of variation in quality of care, attending primarily to the structure of the medical staff and of the hospital wards. When, during the 1960s, the costs of healthcare services began their seemingly inexorable rise, economists attempted to assess what hospital characteristics were associated with cost differences. They examined, variously, the effect on costs of features such as services and case-mix, size, teaching status, type of ownership, and membership in a hospital system. More recently, researchers have examined the diffusion across hospitals of various management reforms, such as matrix management and the total quality management (TQM) approaches to improving quality.

Although most research attention has been devoted to hospitals, organization scholars have also examined the structure, operation, and performance of other, more specialized, healthcare organizations, including multispecialty clinics, health maintenance organizations (HMOs), skilled-nursing facilities, home health agencies, and hospices.

Healthcare Systems

From their beginnings as small, independent, widely scattered units, hospitals have grown enormously in size, complexity, and connectedness during the past several decades. As technologies have become more complex, physician services more differentiated, and economic competition more intense, hospitals have increasingly become more horizontally and vertically integrated. Initially, hospitals entered into loose affiliations with neighboring similar units—forming hospital chains—in an effort to reduce competition, increase economies of scale, and improve learning opportunities. The pioneers in system development in the United States were Catholic hospitals, but their systems largely reflected the organizational structure of the church hierarchy and had little effect on the operational relations among other hospitals.

Since the 1970s, many hospital systems have moved beyond the horizontal integration of similar organizations to build linkages among a diverse set of organizations, including outpatient clinics, extended-care services, urgent-care facilities, HMOs and other physicians groups, rehabilitation

units, home health agencies, and hospices. These connections may involve outright ownership, some sharing of equity, or contractual relations. Studies by Stephen M. Shortell, Jeffrey A. Alexander, and others point out that hospital systems vary in the loci of their integration: Some are constructed around hospitals, others around medical groups, and still others around insurance companies. They also vary greatly in their governance structures, some adopting a parent holding company model of relatively loose integration; others a more centrally integrated model, with a systemwide governance structure; and still others a full-fledged corporate model, with specialized managers overseeing strategic, financial, and marketing functions. Although compared with other industrial and service sectors in the United States, hospitals were slow in moving toward more concentrated modes of operation and adopting the corporate form of governance, in recent decades they have rapidly acquired most aspects of the modern organizational vocabulary.

Organization of the Wider Healthcare Environment

As suggested by the forgoing comments on the growth of healthcare systems, organizing processes are not confined within the boundaries of a given organization. Modern, societal structures are characterized by the elaboration of cultural and relational connections linking social actors and organizations across wider arenas. Organizational scholars have examined these developments principally in the course of research on *organization populations* and *organization fields*.

Organization Populations

An organization population is analogous to a biological species. It comprises organizations sharing roughly the same form and operating systems and reliant on the same resources. As developed by scholars such as Howard Aldrich, Joel A. C. Baum, and Michael Hannan, *organization ecology* examines the founding, growth, and decline of populations of organizations in relation to changes in their material resources and institutional environments. The focus is on the operation and effects of such basic processes as variations among, selection

of, and retention of organizational attributes as these are affected by competition among organizations in the same or related populations. Organizations of the same type not only compete but also look to one another for ideas as to how to act and, often, form associations to further their mutual interests.

The population perspective on organizations represents a fundamental shift in organization scholars' view of organizational change. Rather than stressing purposive—primarily managerial—choice, more attention is given to the presence of situational constraints (the environment) and to random and emergent factors (chance and contingency). Selection processes are emphasized over adaptation. Organizational ecologists emphasize the limits of managerial control due to both cognitive factors and organizational inertia—that is, resistance to change due to sunk costs and vested interests.

Organizations of the same type often are formed at roughly the same time, in response to some opportunity in the environment, and draw on the same types of organizing resources. Thus, as reported by Jeffrey A. Alexander and Terry Amburgey, community hospitals in the United States were founded in large numbers in the early years of the 20th century, and the basic features of their organizational structure were laid down at that time. New organizational populations emerge slowly, but when they become recognizable to their publics and are regarded as an improvement on earlier, alternative forms, they can increase rapidly, having acquired legitimacy. Sometimes, new populations result from changes in institutional rules. Thus, the emergence and rapid growth of HMOs during the 1970s was primarily the result of federal legislation supporting this form, as Douglas R. Wholey has demonstrated.

Organization Fields

An analysis of *organization fields* shifts attention to an even higher level to examine the interdependence of diverse populations of organizations working in the same arena. The concept of field exploits the insight that “local social orders” constitute the building blocks of contemporary societies. Fields are inhabited by a collection of competing and cooperating organizations together with their major suppliers and consumers and by

the regulatory and funding bodies, often at distant locations, that profoundly affect their operation.

Key components of organization fields include (a) organization archetypes, (b) relational systems, (c) governance arrangements, and (d) cultural-cognitive systems. Archetypes are models for the basic types of organizations that inhabit the field. In any given field, we find a delimited number of models for organizing. For example, there are a relatively small number of types of organizations that deliver healthcare services in the United States at the present time. The organizations in a field are connected in a variety of ways, both directly and indirectly, in relational systems. In some fields, these connections are infrequent and brittle; in others, they are routine and strong. They vary also in the extent of their fragmentation and centralization. Field-level governance systems are arrangements that support the regularized control—whether by mutual agreement, legitimate authority, or coercive power—of some subset of actors by others. These systems usually include changing combinations of public and private actors. Cultural-cognitive systems include both the cultural frames that enable actors to interpret events as well as institutional logics that provide routines and symbolic constructions defining appropriate ways to carry on work. As Paul J. DiMaggio and Walter W. Powell have pointed out, organization fields vary in the nature and degree of their *structuration*: the extent to which a small number of recognizable archetypes exists, the density of relations among them, the effectiveness of governance structures, and the degree of consensus on and coherence of the cultural-cognitive systems used.

Research by W. R. Scott and colleagues chronicles changes over the latter half of the 20th century in the field of healthcare services in the San Francisco Bay area. Although by no means a representative case in the United States, this area was often on the cutting edge of healthcare change. Moreover, although the care systems studied were limited to one geographic region, wider state and national forces were considered.

The study suggests that changes in the delivery of healthcare services are usefully partitioned into three periods or eras: (1) professional dominance, (2) federal involvement, and (3) managed care. The era of professional dominance, commencing in the 1920s and extending until the mid-1960s,

was marked by the growing number and influence of physicians in private practice, their professional associations (primarily, the AMA) and independent community hospitals. Healthcare organizations were small and unspecialized. Connections among actors were sparse, primarily informal, and local. Governance structures were dominated by professional associations, except for the state agencies that enforced licensure provisions at the behest of these associations. Primary cultural-cognitive frames stressed a nonprofit, voluntary ethos, and the central institutional logics stressed quality of care—as defined by the physician.

A surge in the number of healthcare professionals and facilities occurred following World War II. Hospitals, with the help of federal funding, grew much larger and more differentiated, and independent physicians increasingly organized themselves in multispecialty groups. Large employers subsidized healthcare coverage for their employees, and insurance companies became active and influential players in the field. After many failed attempts, the federal government, in 1965, passed Medicare and Medicaid legislation covering hospital services for the elderly and the indigent. This significant political event marked the dramatic onset of the era of federal involvement. For the first time, the nation-state was a major player, purchasing more than half of all the health services delivered. Moreover, because of rising healthcare costs, federal officials quickly found themselves engaged in a variety of regulatory and planning activities to control costs. Thus, governance structures, which had been primarily private, and professionals were forced to share control with state and federal agencies. Cultural-cognitive frames expanded to include equity and the importance of access to healthcare services, and patients began to assume a more active, consumer orientation and to explore the use of alternative healthcare providers.

Early in the 1980s, a third era opened, marked by the urgent need to curtail rising costs and a reliance on managerial and market-based instruments. Hospitals increased in size as small hospitals were closed and others expanded, often through merger or acquisition. Numerous specialized organizations appeared, including many freestanding organizations offering services—such as renal dialysis—that had formerly been performed only in hospitals. For-profit hospitals and care units

multiplied. Physicians were increasingly organized in groups, both real and “virtual,” as insurance plans enlisted independent physicians for their panels. Relations among all players in the field became more dense and complex, with employers forming coalitions to negotiate insurance rates; insurance companies contracting with physicians; and hospitals buying or contracting with specialized providers, such as extended care facilities. Managers of healthcare organizations now hold master’s of business administration (MBA) degrees and exercise broad powers in healthcare organizations. To concern about quality and access, a focus on efficiency and a faith in market-based solutions are added.

Although federal agents and corporate managers have not supplanted physicians and other health professionals, the world of healthcare organizations has undergone significant change in the past few decades. Organization forms have become more diverse, more complex, and much more significant in the delivery of healthcare. The continued productive interaction of healthcare and organization theory seems ensured.

W. Richard Scott

See also American Medical Association (AMA); Health Economics; Health Maintenance Organizations (HMOs); Hospitals; Managed Care; Medical Sociology; Multihospital Healthcare Systems; Physicians

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HEALTHCARE REFORM

Families, businesses, and governments are struggling with the ever-increasing costs of healthcare. Every year, about 1 million people are added to the nation’s rolls of the uninsured, now numbering about 47 million. People with insurance are seeing their benefits dwindle and healthcare costs consume an increasing portion of their wages. Even people who have insurance find themselves unable to pay medical bills, and many are going without needed care. Given these conditions, calls for healthcare reform and reform proposals abound, including calls to secure health insurance for all Americans, sometimes called *universal coverage*. This entry lays out how the United States arrived at the mix of private and public insurance it now has, how that mix impedes reform, and the implications of healthcare reform.

Historical Choices

Political efforts to achieve national health insurance were a regular—and regularly unsuccessful—feature of social policy in the first half of the 20th century. The focus here, however, is not on explaining the failure; rather, it is on examining the strategy for achieving health insurance coverage that that failure produced—specifically, the reliance on private, employer-sponsored insurance as the primary means to cover workers and their families, and the promotion of public health insurance to fill the gaps that private insurance would inevitably create.

According to a growing body of scholarship, a variety of forces contributed to the emergence of employer-sponsored health insurance in the 1940s and 1950s: (a) the labor movement's shift from national politics to collective bargaining as the way to gain health insurance, (b) business interests' preferences for fringe benefits over government-run (or labor-organized) health insurance, (c) insurance industry capacity for and interest in providing those benefits, and (d) administrative actions, backed by legislation, establishing tax preferences (most important, the exclusion of employer-paid premiums from employee taxable income) that subsidized employer-sponsored health insurance. The result was the establishment of voluntary, employer-sponsored health insurance as the nation's primary health insurance system, at the very same time other industrialized nations established universal and public health insurance systems not linked to employers' decisions about wages and benefits.

The establishment of employer-sponsored health insurance, in turn, generated a strategy for achieving public health insurance—that is, by focusing on the nonworking population. From the 1950s, national health insurance advocates shifted their attention away from the general population and toward the elderly—a group unlikely to be covered by work-based or other private health insurance. However, the political compromise that established the Medicare program as universal social insurance for the elderly also established the Medicaid program as means-tested health insurance for certain population subgroups—specifically, low-income persons who receive care assistance based on age, blindness, disability, or (in the case of children living with single mothers) dependency status. The overall result was the creation of a public health insurance system targeted to people not expected to work and built around the private (albeit tax-subsidized) insurance system for workers and their families.

Employer-sponsored health insurance expanded dramatically to cover more and more (and a growing share of) workers and their families through the 1970s. But then growth stopped. Through the 1980s and 1990s, the numbers—and the proportion—of working-aged Americans without health insurance coverage grew steadily. Indeed, lack of health insurance among low-wage workers grew so substantially during the recession of the

late 1980s that even the subsequent, unprecedented prosperity of the mid- to late 1990s left a smaller proportion of low-wage workers covered at the end of the 1990s than had been covered a decade before. The clear lesson of the 1990s was not only that a threatened economy reduces health insurance coverage but also that a prosperous economy cannot guarantee it. At least for the time being, employer-sponsored health insurance remains successful in serving the vast majority of better-off workers. But employer-sponsored insurance inevitably excludes significant numbers of low- and modest-wage workers in both large and small firms.

The public health insurance system also grew in the second half of the 20th century. Medicare was expanded in 1972 to include disabled beneficiaries of Social Security (after a 2-year waiting period) and people with end-stage renal disease. But Medicare was not extended to insure the younger population, as some proponents had hoped it would be. Although federal legislation in the 1970s actually narrowed the population covered by Medicaid, ultimately Medicaid was expanded to reach certain groups with ties to the workforce: (a) children of lower-income workers; (b) pregnant women in working, two-parent households; and (c) persons with disabilities who are able to return to the workplace with supports. Medicaid's most substantial expansion came in the 1980s and 1990s through enactment of national, income eligibility standards (higher than cash assistance eligibility standards in many states) for children and pregnant women. In the late 1990s, the State Children's Health Insurance Program (SCHIP) provided a further, modest expansion of coverage for children. But, except for its coverage of low-income, aged, and disabled persons, Medicaid has remained a program for children and, to a much lesser extent, their mothers. States have the option to cover parents (fathers as well as mothers), but in most states, parents earning the minimum wage have too much income to qualify for Medicaid. And federal law, today as in 1965, does not extend Medicaid eligibility to low-income adults who are not the parents of dependent children. Except in a few states that operate their Medicaid programs as special, federally sanctioned demonstrations that waive traditional Medicaid eligibility restrictions, the history of targeting public protections to exclude workers, regardless of income, persists.

Overall, employer-sponsored insurance and the programs designed primarily for people outside the workforce—Medicare for the elderly and some of the disabled, and Medicaid for children and pregnant women—cover about 85% of the U.S. population. But their explicit structures mean that they exclude people who work but nonetheless are not offered health insurance coverage through their jobs and who, primarily because they work, remain outside the categories covered by public programs.

Barriers to Reform

Given the health insurance-financing system currently in place in the United States, a simple way to explain the country's failure to enact reform is that the "haves" have health insurance; it is the "have-nots" who do not. Although it is true that anyone can fall out of employer-sponsored coverage—for example, by losing one's job or getting divorced—the vast majority of Americans can count on receiving health insurance through their jobs. The roughly 15% of Americans who are uninsured are overwhelmingly workers in low- and modest-wage jobs that do not offer health insurance and working-aged adults who do not qualify for Medicaid. The primary political and policy problem that the United States faces is that it is almost impossible to insure the have-nots without, in some way, disrupting the status quo of the haves.

An obvious form of disruption comes from the need to raise the financial resources to subsidize health insurance for the economically disadvantaged uninsured. The full cost of employer-sponsored coverage of a typical family is more than \$12,000 per year. If comparable insurance were available to individuals outside employment, it would absorb more than 20% of their income for the great majority of the uninsured. Virtually every health insurance expansion proposal, regardless of its form, recognizes that the cost of health insurance is too high to expect the uninsured to purchase it without subsidies. Subsidization entails redistribution—taxing those who have health insurance to subsidize health insurance for those who do not. Historically, the need for redistribution has posed a substantial, political barrier to reform.

But equally problematic is the policy difficulty of getting health insurance to the uninsured without in some way disrupting the actual insurance of the already insured. National health insurance via a single-payer or Medicare-for-all strategy actually intends disruption—or, more accurately, replacement—of employer-sponsored insurance with what its advocates believe would be a simpler, more equitable, and more efficient system. Whether or not they are correct, the reluctance to disrupt Americans who have health insurance—specifically, to legislate both the redistribution of financing and the shift from private to public coverage that a single-payer system would entail—has inhibited many politicians and policymakers from tackling "replacement" head on.

Thus, the dilemma of reforming healthcare is to design a policy that can cover the uninsured without affecting the already insured and at the same time achieve political success, which is difficult if the already insured perceive that they will be worse off as a result. This dilemma is not limited to expansions aimed at universal coverage. Incremental-expansion proposals that focus on achieving small improvements for low-income populations not only make redistribution from the haves to the have-nots explicit (as only the latter receive new benefits), they also affect the coverage of the already insured. Except for a proposed expansion that would limit eligibility to individuals with incomes below the federal poverty level (a group in which hardly anyone has employer coverage), any coverage proposal is likely to make new, publicly subsidized benefits available not only to the uninsured but also to significant numbers of people who already have insurance. With a new coverage option available, even individuals with employer coverage might replace that coverage with free or near-free benefits provided at public expense. And should those benefits be made available, employers—particularly employers whose employees earn relatively low wages—might decide to drop the coverage they currently offer, essentially forcing their employees to find coverage elsewhere.

Since 2000, rising premiums and reduced benefits have increased concern among people who have employer-sponsored health insurance that even with insurance they are no longer assured of access to affordable, quality healthcare when

they need it. As a result, health reform is a key issue in the 2008 presidential campaign. Whether reform becomes a reality will depend on the leadership of a new president and whether most people come to have confidence that everyone—the insured along with the uninsured—have more to gain than to lose from reforming the health-care system.

Judith Feder

See also Access to Healthcare; Health Insurance; National Health Insurance; Public Policy; State-Based Health Insurance Initiatives; State Children's Health Insurance Program (SCHIP); Uninsured Individuals

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Web Sites

- Center for Studying Health System Change (HSC):
<http://www.hschange.com>
- Henry J. Kaiser Family Foundation (KFF):
<http://www.kff.org>
- Universal Health Care Action Network (UHCAN):
<http://www.uhcan.org>

HEALTHCARE WEB SITES

Healthcare Web sites are electronic pages available on the Internet that are generally designed to serve one or more of three different groups: (1) healthcare consumers, (2) healthcare practitioners, and (3) health services researchers. Many are published by government agencies, private foundations, or healthcare organizations; however, the Internet as a publishing medium is open to anyone with computer access. This freedom to publish can be a problem, especially in the case of healthcare Web sites, as people may make life-affecting medical decisions based on the information they read online. To this end, organizations exist that attempt to monitor healthcare Web sites and provide standards or quality criteria by which to evaluate sites.

Healthcare Consumer Web Sites

Many consumer Web sites aim to help people maintain healthy lifestyles through their behavioral choices. More sophisticated sites offer online tools and calculators that provide customized recommendations or advice based on one's personal data. One example is a body mass index (BMI) calculator, which determines whether someone is in a healthy weight range for his or her height. With an emphasis on preventive care, these types of consumer sites are motivated not only by a humanitarian desire to improve public health but also by the need to control healthcare costs. Accordingly, the major publishers of these types of sites are healthcare organizations such as hospitals, insurance companies, or those government agencies that finance a substantial portion of their citizen's medical care. As people publish personal health data online or their healthcare providers or insurance companies do so, privacy issues are of increasing concern. Sites that allow users to create electronic clinical records, for instance, run a risk of being hacked into and exposing patients' medical histories. Nevertheless, these sites do provide valuable services to consumers by empowering them to be more active in their own care. Some sites act as virtual, social-support networks for patients by using interactive technologies such as discussion boards or e-mail

lists to foster communication among people with similar medical conditions.

Healthcare Practitioner Web Sites

Web sites for healthcare practitioners offer types of information similar to that for consumers, though the content is written for a professional-level audience. Practitioner sites feature things such as journal article summaries, continuing-education opportunities, and reference materials from textbooks. Sites for practitioners are typically targeted to specific professions (e.g., physicians, nurses, or physical therapists) and, within those professions, to specialty areas (e.g., cardiology, geriatrics, or public health). Evidence-based practice Web sites are one type of site of particular value to busy healthcare providers who do not have time to comprehensively search the literature, read all the original research, and formulate their own conclusions to drive decision making. As with consumer sites, healthcare practitioner Web sites provide opportunities for networking.

Health Services Researcher Web Sites

Health services researchers have greatly benefited from the advances in e-health. Never before has it been so easy to obtain data on healthcare access, cost, quality, and outcome. Rather than being stored on individual computers or existing solely in summarized written records, health services data sets can be published online, downloaded by other researchers, and manipulated and recombined to elicit new information. The fact that these data sets are often assembled by government organizations means that the data are typically freely available. However, restrictions on use may apply when individuals could potentially be identified by demographic information.

Quality of Web Site Information

Although data privacy concerns are a major consideration in the development of healthcare Web sites, of highest importance is the quality of the information such sites provide. Two leaders in the

movement to monitor health information quality online are the Health On the Net (HON) Foundation and URAC. The HON Foundation is an international effort based in Switzerland and started in 1995 by a group of telemedicine experts. Its HON Code of Conduct (HONcode) lists eight principles for ensuring that healthcare Web sites publish accurate, reliable, and valid information. Sites that respect all eight items (authoritative, complementarity, privacy, attribution, justifiability, transparency, financial disclosure, and advertising policy) can apply for free accreditation, which allows the sites to display the HONcode logo and be listed in the HON search database of accredited, healthcare and medical sites. Approved sites are policed on a regular basis to ensure that they maintain the basic ethical standards set by HON.

Unlike HON, which is focused solely on online information provision, URAC offers accreditation to healthcare organizations in more than a dozen program areas; their health Web site program is only one. Developed in 2001, the more than 50 URAC standards evaluate healthcare Web sites on disclosure and linking, health content and service delivery, privacy and security, and quality oversight. Also unlike HON, URAC charges for its accreditation seal and covers only Web sites from U.S. companies. The HON and URAC online directories of accredited sites are an efficient starting point for locating reliable healthcare Web sites.

Health Information Professionals and Organizations

Health information professionals specialize in the selection and organization of both print and electronic materials. Since the early stages of healthcare Web site development, these professionals—often medical librarians—have led efforts to establish quality criteria and create virtual collections of health sites. At the forefront in the United States are the National Library of Medicine (NLM) and the Medical Library Association (MLA), a government agency and a professional organization, respectively, that have published directories of top healthcare Web sites for consumers, practitioners, and researchers.

Lisa C. Wallis

See also Computers; E-Health; Electronic Clinical Records; Health Communication; Health Informatics; Health Insurance Portability and Accountability Act of 1996 (HIPAA); Preventive Care; Telemedicine

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Web Sites

- Health On the Net (HON) Foundation:
<http://www.hon.ch>
- Medical Library Association (MLA):
<http://www.mlanet.org>
- National Library of Medicine (NLM), MedlinePlus:
<http://www.medlineplus.gov>
- Pew Internet and American Life Project:
<http://www.pewinternet.org>
- URAC: <http://www.urac.org>
- U.S. Department of Health and Human Services (HHS):
<http://www.health.gov>

HEALTH COMMUNICATION

According to the federal government's initiative Healthy People 2010, health communication should examine and advance communication strategies to inform and influence individual and community decisions that lead to improved health. Health communication is relevant in a variety of contexts: health literacy, dissemination of health

risk information, health professional/patient interactions, strategies for preventive health and population-based medicine, and the developing field of telehealth applications.

Background

The use of health communication dates back to Aristotle who first described it in his anthology *The Rhetoric* in the 4th century BCE. Today, the humanistic theory of Carl Rogers and Abraham Maslow has dominated the fields of health communication theory. The 20th century saw the advent of better methodologies, incorporating insights from the fields of sociology, psychology, and linguistics. Mass communication media, such as radio, television, and the Internet, have established social marketing and advertising as important tools for health communication, with ever-broadening horizons in the 21st century.

Effective communication channels are critical to the success of public health programs targeting health behavior change at the individual, community, or population level. Communicating consumer health information is vital as it enables people to be aware of their health status and needs and to make informed decisions about a variety of issues such as adopting a healthy lifestyle, seeking treatment, and choosing suitable health insurance benefits, health retirement plans, and long-term care. In a public health context, it encompasses the areas of disease prevention and health promotion to improve the quality of life as well as the formulation of the health policies that support mass communication of healthcare strategies to individuals, communities, and the public. The targets of health communication can be individuals, as in physician–patient relationships; communities or specific ethnic or racial groups, as in many local and state programs or research-based interventions; or the population in general, as in national programs such as the abstinence program. Health communication should be culturally and linguistically targeted to reach all ethnic groups and written in a way that can be easily understood.

Effective communication is also vital for a successful physician–patient relationship. The explosion of information technology and easy access to the Internet has widened the use of these portals as

providers of health information. However, as information available electronically is unregulated, it may be unreliable. Such information can be misleading and even harmful if not properly understood by lay people. People have great faith in public communication channels and tend to blindly accept what is reported.

Communication partnerships, usually forged between organizations serving similar clients and settings, create functional linkages that avoid replication of services, ensure uniformity in message creation, synergize expertise and effort, and are more cost-effective and successful.

Objectives

The objectives of health communication need to be clearly identified before designing and implementing programs. The two fundamental objectives are to promote change in individual behavior and to promote change in larger groups or the environment, such as in the workplace or at the local, state, or national level. At the individual level, two types of communication interventions are commonly used. In *informed decision making*, information is given to enable a person to make better health decisions, a method commonly used in medical care. *Persuasion-oriented communication* aims to convince people to change their health behaviors for the better. This approach is useful in public health interventions that promote well-established, evidence-based programs such as cancer and blood pressure screening, weight reduction, and the prevention of sexually transmitted infections. For the second objective of promoting change in large groups or the environment, *advocacy interventions* involve policy change or changes in the laws at various levels. Examples of these interventions are mandatory seatbelt and child seat use and improving safety and working conditions in the workplace.

Communication Theory and Health Behavior Change

Communication has several levels of interactions: (a) *intrapersonal*, or how people process information for themselves; (b) *interpersonal*, or

how two individuals influence each other; (c) *group dynamics*, where many people interact and influence one another; *organizational*, which can be public, private, or collaborative; and (d) *community or population*, where communication influences societal change on important issues.

Health behavior change models use communication theories extensively. The *health belief model* and the *theory of reasoned action* both rely heavily on communication methods to encourage individuals to adopt healthy behaviors. Other theories such as the *social cognitive theory*, *diffusion theory*, and the *transtheoretical model* are used as catalysts for health behavior change at the population level by using communication channels that influence an environmental as well as individual acceptance of better health habits. The *consumer information processing model* works on the premise that humans seek information only when motivated to do so. According to its concepts, to make health information acceptable to consumers, it must be readily available and perceived as innovative, helpful, and easily processed or adaptable.

Interpersonal communication is the common channel of communication used in health research and dissemination: Information and advice from peers or healthcare personnel about an innovation often carries more weight in a decision to change than merely reading or hearing about it from impersonal sources. This method is used in the community-based *participatory action approach* to provide successful and sustainable public health dissemination strategies.

Applied communication perspectives are used in public health to assess how communication strategies can negatively influence human behavior, exemplified by tobacco and fast food advertising, or positively influence behavior change, as seen in the success of antitobacco campaigns and the promotion of condom use. Empirical studies involve the application of scientific methods to study the effects of a communication strategy, as is frequently used in public health. Critical studies are more broad based as they apply methods of cultural, literary, or normative criticism to the study of outcomes on how health-related media content influences behavior change.

Methods

Health education, which is focused on improving individual health behaviors by providing information and instruction, is the most commonly used mode of health communication. The source of such messages can be from healthcare professionals, public and private clinics and hospitals, community health centers, libraries, school and worksite programs, television, radio, newspapers, magazines, pamphlets, brochures, and posters. Printed materials are readily found in most public health agencies, private practitioner offices, healthcare institutions, and voluntary health organizations. The use of outdoor media—billboards and signs, placards on commercial transport such as trains and buses, flying billboards, blimps, and skywriting—may have a fleeting impact. The mass media are useful tools for the transfer of information, concepts, and ideas to both general and specific audiences with the main functions of education, advocacy, and shaping public relations. However, mass media use is expensive and often sensationalizes the messages to increase the number of viewers. *Social marketing* is a large-scale activity that uses business principles to create mass media campaigns targeting population groups with messages for positive behavior change.

The triad of information, education, and communication (IEC) is a well-accepted continuum promoted by the World Health Organization (WHO) for reproductive health programs. The IEC campaigns aim to forge links with existing programs and organizations to reinforce channels of communication and incorporate local community traditions into the communication strategies to enhance acceptability. The campaigns also advocate using the audience segmentation technique—in which the audience is chosen from people with similar demographic and cultural norms—for better health communication. This approach exemplifies the use of sound, social-marketing techniques and behavioral-research strategies to craft targeted messages that are short, sharp, attention grabbing, and easy to adopt.

Telehealth is geared to support a variety of health professionals involved in health communication, including physicians, nurses, public health professionals, and health administrators. Provision

of long-distance, clinical care is gaining popularity because it is convenient and saves time and costs. *Telemedicine* (a subset of telehealth) is confined to the use of telecommunications and computer technologies in clinical care. Physicians of all specialties can use *teleconsulting* at the local, national, and global levels. Earning continuing medical-education credits through the Internet is an increasingly accepted method for healthcare professional organizations and is gaining popularity owing to its ease of accessibility.

Health communication between health professionals is just as important to maintain awareness of the latest trends and developments and the needs of the healthcare sector. Electronic communication networks form the backbone for fast, inexpensive sharing, reporting, and dissemination of public health information. These networks are particularly useful for communicating between agencies and to the public during public health emergencies such as natural disasters and epidemics.

Hallmarks of Effective Communication

Effective communication is critical to the success of programs targeting health behavior change either in individuals or at the population level. Communication strategies are cost-effective only if the desired impact is achieved. Exploratory audience research during program development will identify the incentives and barriers to be addressed in communication strategies and the most acceptable sources of information for and channels of communication to the target population. Pretesting the final products and incorporating suitable recommendations ensures that the message is consumer-friendly, culturally appropriate, and understood by most people. Audience research at the end of a program is useful in evaluating the impact of health communication, identifying shortcomings, and redesigning it for wider, more effective dissemination.

It is important that communication be reliable and based on evidence derived from formative evaluation and communication research in the targeted population. Research shows that public health information dissemination is most successful when multiple communication channels are employed. A multidisciplinary approach that uses

the media, academia, government, policymakers, private organizations, and community collaboration as vehicles for dissemination is most likely to result in positive health behavior change. Integrated efforts have a symbiotic effect and are sharply focused, more cost-effective, and more likely to have a sustainable impact. A preliminary needs assessment should be conducted, before beginning a new initiative, using a mixed methods approach to gather information on devising a communication strategy for the target audience. Ongoing process evaluation allows for suitable modifications throughout the course of a program. An outcome evaluation is conducted to assess the impact of the program in changing the patterns and attitudes of the study population during the health intervention.

Media communications has a critical role to play in public health, which aims to influence individual behaviors in large segments of the population. Because they are believed to provide factual and evidence-based information, those messages from respected and legitimate media, organizations, and academia have a huge public impact in inducing or inhibiting behavior change. Successful health promotion campaigns have communication channels that are audience oriented, gender friendly, culturally sensitive, and easily understood by the public. Creation of such strategies is possible through multidisciplinary approaches involving input from media sources, journalists, public health and medical professionals, academics, policymakers, and most important, people from all segments of the target audience.

Future Implications

In effect, health communication must play an integral role in public health and medical practice, with special attention to meeting the needs of vulnerable populations. Knowledge of health communication theories and practices is essential for healthcare professionals, health policymakers, politicians, and collective action groups seeking to develop cost-effective, consumer-oriented strategies that will have a maximal impact on personal or mass health and healthcare. Efforts are under way to enunciate certification, quality assurance, and ethical standards for people and organizations

involved in health communication practice, research, and training.

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See also Ethnic and Racial Barriers to Healthcare; Health Disparities; Health Literacy; Healthy People 2010; Patient-Centered Care; Public Health; Quality of Healthcare; Telemedicine

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Zoller, Heather M., and Mohan J. Dutta, eds. *Emerging Perspectives in Health Communication: Meaning, Culture, and Power*. New York: Routledge, 2008.

Web Sites

American Public Health Association (APHA):
<http://www.apha.org>

Coalition for Health Communication (CHC):
<http://www.healthcommunication.net>

Healthy People 2010: <http://www.healthypeople.gov>

National Communication Association (NCA):
<http://www.natcom.org>

HEALTH DISPARITIES

Health disparities are major differences or inequalities in health status between majority and minority groups within a population. Health disparities

also refer to differences between groups in access to health services or treatments and in the quality of services or treatments received. They may be caused by differences in gender, race, socioeconomic status, or insurance status or by higher environmental and behavioral risks. Ethnic and racial minority groups in the United States disproportionately experience poorer health status. Health and healthcare disparities often derive from and are embedded in the larger historical, geographic, demographic, sociocultural, economic, and political context.

Barriers to Addressing Healthcare Disparities

Barriers to accessing healthcare stem from many factors: personal, financial (uninsured or underinsured), language, geographic, sociocultural, the institutional arrangements of health systems, and the legal, regulating, and policy environment. Some of these factors may produce inconvenience and frustration, while others may actually prevent people from getting the healthcare they need. These barriers vary with population, location, and political situation and should be assessed by each community, especially those with medically underserved populations.

Overview

The basic contours of socioeconomic and ethnic and racial disparities in health are wellknown. Socioeconomic status is inversely correlated with virtually all the major indicators of health status, including functional impairments, self-rated health, and disease-specific morbidity and mortality. Moreover, research demonstrates that socioeconomic position in society is linked to health through a variety of pathways, including access to care, environmental exposures, and life stressors. Race and class are codeterminants of disparities in health, each having its own additive effect. Healthcare disparities are arguably a major cause of health disparities; they include poorer access to healthcare services and poorer quality of the healthcare services received. One explanation for the relationship between access to healthcare and health status for low-income minority groups is that they have less access to and make

less use of healthcare services (including preventive care), and therefore, they suffer worse health status. For instance, minority groups may be less likely to have a usual physician or source of care, that is, a specific primary-care physician. Not having a usual physician or usual clinic for routine healthcare may be due to a variety of factors such as lack of participating medical providers, lack of knowledge or trust in the medical system, lack of understanding about the importance of preventive care, lack of financial resources, or a combination of these factors. The explanations and specific causal factors are likely to vary for each group.

Disparities in Access

Existing disparities in healthcare access based on minority status, health status, and urban versus rural status are well documented. National surveys have consistently found that Blacks, despite their lower ambulatory-care use and lower access to a usual source of care, were less likely than Whites to report problems in getting needed care and were also equally likely to report that they were very satisfied that their family could get the healthcare they needed. In contrast, Hispanics were more likely to report problems with family members getting needed treatment and less likely to report problems getting care for themselves. There are, in other words, different perceptions of access difficulties between groups.

Getting some healthcare is different from getting the healthcare the individual needs, and this is related to the issue of the quality of the healthcare received. Access to poor-quality care may still leave an individual with unmet needs and, therefore, not truly achieving access to needed care. Knowledge, health literacy barriers, and patterns of use are affected by cultural norms, and these also affect the utility of proxy measures of access (e.g., a usual source of care).

A national telephone survey in 1991 found that 16% of all respondents lacked a regular source of ambulatory care. Other national surveys between 1987 and 1996 showed a wide range, from 6% to 45%, of uninsured persons reporting problems getting needed healthcare. Between 1994 and

1997, nearly one quarter of all American families reported that it had become more difficult to get medical care, and in the same surveys, Blacks or Hispanics and young adults were more likely to report worsening access to care. Another study found that where an individual lives matters as well: Only 15% of the variation across communities in getting necessary healthcare was accounted for by differences in the characteristics of the uninsured (e.g., their health status, age, gender, family income, and ethnicity or race). Also, the pattern of variation in access for the uninsured and privately insured, in terms of their ability to obtain needed healthcare, does not correlate, meaning that the communities with relatively high levels of access problems among the uninsured do not necessarily have the highest levels of access problems for the privately insured. These studies documented disparities in access, but they did not examine what factors most highly correlate with these disparities. In addition, a lack of standardization and methodological differences in measuring access makes it virtually impossible to draw any conclusion from the various surveys about trends in unmet health needs over time.

Different populations face various combinations of barriers to accessing healthcare. For instance, members of ethnic and racial minority groups may face barriers due to stereotyping prejudice as well as distrust owing to historic and personal social conflicts or misunderstandings. Low-income populations may face difficulty with finances, child care, getting appointments, and medical debt. Underserved and rural populations may struggle to find a physician in their area or have to travel long distances to get the healthcare they need. Recent immigrants may have more difficulty navigating the bureaucratic red tape of an unfamiliar healthcare system, compounded by language and cultural barriers. A typical example is recent immigrants of an ethnic and racial minority who have low incomes and live in an underserved area. Barriers to healthcare services are a cause of healthcare disparities and are a factor in health disparities between different socioeconomic groups in a population. Healthcare disparities (differences in the amount and type of healthcare available and received) are arguably a major cause of health disparities.

Barriers to Healthcare

Barriers to access are those factors that contribute to preventing a person from using a healthcare service when needed. Although researchers have speculated on the barriers to access faced by various ethnic and racial groups, few have quantified or characterized the number and severity of the barriers faced, nor have they correlated them with the probability of achieving access to needed healthcare services. Researchers have noted that many of the existing disparities remain unexplained, presenting a challenge to the development of policies to eliminate them. While the variation in health insurance coverage is the most studied, possible explanation and a key area of emphasis for recent health policy reforms, other studies suggest that variations in health insurance coverage may be only a small part of the explanation.

Many studies have shown significant ethnic and racial differences in experience with, access to, and use of care in health plans; however, few of these studies have focused specifically on the free-clinic populations. In fact, many focus on insured populations and the disparities that persist even between people with the same insurance coverage. In addition, few studies have tried to further define or explain the cause of these differences, and those that have, have had limited success.

There have been a number of different approaches to measuring these barriers. One study did a door-to-door survey of people living in poverty asking about what they perceived to be personal barriers to accessing healthcare services. In that population, 74% reported having more than one barrier. The researchers found that the most common barriers were the lack of information about free or reduced-cost healthcare, anticipated costs, and the difficulty of accessing child care. Barriers were similar for working and nonworking residents, with the exception that transportation was more of a barrier for the nonworking. This study, however, only recorded the reported barriers and did not correlate them with any measures of access to healthcare. Other researchers have attempted to construct questionnaires to measure the barriers to healthcare faced by parents of children with chronic health conditions. One group of

researchers has developed a 41-question survey instrument that divides barriers into 5 subscales: (1) skills, (2) marginalization, (3) expectations, (4) knowledge and beliefs, and (5) pragmatics.

Other researchers have divided healthcare barriers into supply and demand sides: characterizing them and suggesting policies for addressing them as market failures. They found that while demand-side barriers may be as important as supply-side factors in deterring patients from obtaining care, relatively little attention was given, either by policymakers or researchers, to ways of minimizing their effect. These barriers are likely to be more important for the poor and other vulnerable groups, where the costs of access, lack of information, and cultural barriers impede them from benefiting from public spending. In this entry, demand-side determinants are defined as those factors that influence demand and that operate at the individual, household, or community level. Table 1 presents some examples of demand-side, demand and supply interaction, and supply-side barriers to healthcare.

Correlating Barriers and Access

There are many factors other than insurance that affect access to healthcare, and access in the United States varies between populations and by the type of care needed. The preponderance of the research to date shows that local-area economic indicators, income, and demographic characteristics are the most important factors, while level of education attained explained little about access to healthcare. It is important to understand that there are significant, noninsurance barriers to achieving access, including transportation, language, ethnicity, and immigration status. It is also important to understand that barriers have differential impacts on different populations.

Severity of Different Barriers

The severity of barriers to healthcare can also differ. These barriers include the following: finances (including cost, insurance, and debt), beliefs and knowledge, prejudice and racism, health status, and other barriers. Each of these barriers is discussed below in more detail.

Finances

Health insurance coverage is a major factor in accessing healthcare services. In 2007, there were an estimated 45.7 million uninsured Americans below the age of 65 (about 18% of the population). Specifically, 13% of Whites were uninsured, while 17% of Asians, 22% of Blacks, 33% of American Indians, 36% of Hispanics, and 15% of multiracial persons were uninsured.

Poverty and cost issues are also a major factor in accessing healthcare services. In 2005, 13% of Americans were living in poverty. The poverty rate for Whites was 8.2% in 2006, compared with 24.3% for Blacks, 10.3% for Asians, and 20.6% for Hispanics. Financial resources have a direct effect on access to healthcare, but they also have an indirect effect as they are the best proxy measure for “class” (poverty vs. middle or upper class), which is a risk factor that is highly correlated with racial disparities. A recent national survey found that 55% of the respondents who owed money for medical bills found it harder to get medical care, and 33% had been denied medical care because they owed money for past treatments.

Beliefs and Knowledge

A study in Los Angeles, California, found that homeless persons are willing to obtain healthcare if they believe that it is important, and better health outcomes were associated with having a usual source of care. In the field of emergency medicine, there is an ongoing debate regarding who should use the hospital emergency department as their usual source of care—a costly and arguably inefficient pattern of use. However, there are little accurate national data on the prevalence of such usage. One study used the National Center for Health Statistics’ (NCHS) 1998 National Health Interview Survey to estimate the number of Americans who name the hospital emergency department as their usual source of care, and compared their characteristics with those of people who have a usual source of care other than the emergency room. It found that 1.7 million or 0.9% of Americans reported that the hospital emergency department was their usual source of care. Those individuals tended to have the following characteristics: low income, lack of health insurance coverage, younger age, male gender, and a member of an ethnicity or racial minority group.

Table 1 Supply and Demand Barriers to the Utilization of Healthcare

		<i>Example of Barrier</i>
Demand side	<ol style="list-style-type: none"> 1. Information on healthcare choices and providers 2. Education 3. Indirect consumer costs <ol style="list-style-type: none"> a. distance cost b. opportunity cost 4. Household preferences 5. Community and cultural preferences, attitudes, and norms 6. Price and availability of substitute products and services 	<ol style="list-style-type: none"> 1. Lack of knowledge about providers 2. Low ability to assimilate health choices and negotiate access to appropriate providers 3a. Lengthy and time-consuming travel to care facilities b. Need for patient (and caretaker) to leave work for long periods to obtain care 4. Asymmetric control over household resources 5. Reluctance to seek healthcare for women outside the home; community resistance to using modern medical care to assist with pregnancy 6. Patients seek treatment through providers that are inappropriate for their condition, such as drug sellers
Demand and supply interaction	<ol style="list-style-type: none"> 1. Direct price of a service of a given level of quality (including informal payment) 2. Quantity rationing 	<ol style="list-style-type: none"> 1. High cost of services; large, unofficial payments to staff 2. Long waits to see medical staff
Supply side	<ol style="list-style-type: none"> 1. Input prices and input availability <ol style="list-style-type: none"> a. Wages and quality of staff b. Price and quality of drugs and other consumables 2. Technology 3. Management and staff efficiency 	<ol style="list-style-type: none"> 1a. Absenteeism, staff not attracted to the area b. Scarcity of supplies, weak cold chain 2. Inability to treat disease with given technology 3. Poor quality of management training, lack of management systems

Prejudice and Racism

Ethnic- and racial-minority populations experienced worse primary care, particularly in the first-contact aspect, than did White Americans. Their usual sources of healthcare were more likely to be hospital settings than private clinics. They faced greater barriers accessing their usual source of care, finding it more difficult to get an appointment and waiting longer during an appointment. Many of the significant differences persist even after adjustment for sociodemographic and health status characteristics.

Ethnic and racial healthcare disparities in primary-care experience are not simply a reflection

of sociodemographic and health status differences across ethnic and racial groups. Prejudice and the history of segregation persist in health disparities today: The primary care provided to Blacks and Whites continues to be, to a large extent, more separate and unequal than hospital care and may contribute to persistent disparities in referrals for diagnostic and specialized procedures.

Immigration status has a huge effect on access to healthcare services, as well: In Los Angeles, California, only 17% of native-born citizens are uninsured, while 41% of foreign-born, legal residents and citizens are uninsured, and 68% of undocumented immigrants are uninsured. One study found that racial disparities in healthcare

are not explained by the commonly cited access factors.

Interestingly, self-reported discrimination is also significantly associated with physical and mental health. In a national sample of adult Americans, persons who reported a high level of day-to-day discrimination had more than twice the odds for major depression and more than three times the odds for generalized anxiety disorders as people who did not, regardless of their race.

Health Status

Although many of the healthcare needs of individuals with disabilities are similar to those of people without disabilities, the presence of a disabling condition can place the individual at greater risk than the general population for secondary conditions, greater use of downstream services, increased need for durable medical equipment such as wheelchairs, functional decline, decreased independence, and psychological distress. A study of another at-risk population, children with special healthcare needs, showed that they have higher levels of unmet needs for medical services than the general population. In addition to the importance of insurance, children are vulnerable because of their social circumstances (e.g., poverty) and have significantly greater odds of having unmet needs for routine and specialty physician care.

Other Barriers

Barriers in areas such as communication with healthcare providers, provider availability, employee's ability to get time off from work, and the availability of child care services have not been adequately studied. Ethnic disparities in healthcare are largely explained by differences in English language fluency (e.g., between Spanish-speaking Hispanics and other non-Hispanic groups). Millions of American children also lack access to healthcare because of poor transportation systems: Their parents may not have a car, and in many locations, particularly in rural areas, there is little or no available public transportation.

Future Implications

Groups of people face health disparities, at least in part, because they face more barriers to accessing good healthcare. Therefore, by eradicating the barriers to healthcare that some groups face, society can reduce the health disparities. The important question society needs to address is, What barriers are the most severe in terms of preventing people from getting the healthcare services they need? Although much research has been done documenting the disparities in health and access to healthcare, and many surveys have asked about the barriers people face, very few have correlated these barriers with health services use, and none have looked at a correlation between the number, type, and severity of barriers faced and the probability of achieving access to needed healthcare services. Clearly, much research needs to be conducted in the future.

Robert F. Rich and Cindy L. Elkins

See also Access to Healthcare; Cultural Competency; Equity, Efficiency, and Effectiveness in Healthcare; Ethnic and Racial Barriers to Healthcare; Health Communication; Health Literacy; National Healthcare Disparities Report (NHDR); Vulnerable Populations

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<http://www.iseqh.org>
- National Center for Health Statistics (NCHS):
<http://www.cdc.gov/nchs>
- National Center on Minority Health Disparities (NCMHD): <http://ncmhd.nih.gov>

HEALTH ECONOMICS

Health economics is the study of the supply and demand of health and healthcare services. While there are many types of healthcare services, health economics focuses on those related to medical care even though factors such as diet and exercise may be equally or more important determinants of health. Health economics provides a framework for identifying the determinants of the supply and demand for healthcare services and describes how the structure of the market for these services interacts with the supply and demand to determine the price and quantity of healthcare services. Defining the efficient use of healthcare services and how it can be achieved is the ultimate, normative goal of health economics. The second major focus of health economics is the broader study of the supply and demand of health. Notably, there is no market for health per se, and the supply and demand for health is largely determined by individuals.

Supply and Demand of Health

A key distinction in health economics is that between health and healthcare. There is no market for “health” where health can be purchased. Instead, health is produced by individuals and families using healthcare services, time, and other market goods such as exercise. This focus on health production is the basis of the *human capital model* of health. Moreover, health is a *durable good* that yields a flow of services over time. As such, health depreciates with time as an individual grows older. Purposeful changes in health are achieved through investments in health, such as the use of healthcare services and time spent exercising. Therefore, health at any particular age is a consequence of all past investments in health and past rates of *health depreciation*.

Another important tenet of health economics is that health is simultaneously a *consumption good* and an *investment good*. As a consumption good, good health is valued by the consumer for the physical pleasure it brings and for facilitating the enjoyment of life’s other activities. As an investment good, however, good health also enhances a person’s ability to learn and earn, which leads to greater consumption of all goods. In addition, because health is a durable good that yields a flow of future services, health is similar to other types of investments that require initial outlays in return for future benefits.

The canonical model of the supply and demand for health was developed in the early 1970s. In this model, a consumer desires health and other goods and chooses the optimal amount of health and other goods depending on the price of those goods. The unique thing about health, however, is that it is not purchased. Health is produced by the consumer using medical care, time, and other goods. The price or supply of health is determined by the cost of producing health, which depends on the costs of inputs used to produce health such as the cost of a person’s time (e.g., wage), price of medical care, and productivity of inputs used to produce health. The optimal amount of health, or the optimal stock of *health capital*, is chosen to equate the *marginal benefits* to the *marginal costs* of health capital. The marginal benefits of health are the discounted lifetime benefits of an additional unit of health capital and include the psychic

value of better health and the increase in earnings resulting from better health. The marginal costs of health are the costs of investment in health.

The human capital model of health results in three main predictions that can be used to explain differences in health. These predictions relate to the relationships between the depreciation of health capital and health, wages and health, and education and health. The first prediction from the human capital model of health is that higher rates of depreciation of health capital will cause health to be lower. The rate of depreciation of health increases with age, and therefore, health decreases with age. At some point, the consumer will find it too costly to offset the growing rate of depreciation (sickness), and health will deteriorate to the point of death. Rates of depreciation may be lower because of genetic and biological factors, which are largely impervious to social intervention, or because of environmental factors, which are amenable to social intervention. For example, government programs that improve the physical and social environment of people may reduce the rates of depreciation of health and result in an increase in health. The rates of depreciation are likely to be higher and health worse in less developed countries because of harsher environments and the biological disadvantages resulting from poorer maternal health.

The second prediction is that higher wages will improve health. Higher wages increase the marginal benefits of health by increasing the value of earnings capacity resulting from better health. Therefore, persons with higher earnings capability will invest more in health and be healthier. Higher wages also imply greater lifetime wealth and better health.

Finally, education will be positively associated with health. Those with more education will be more productive at producing health, which lowers the cost of investing in health. Thus, more educated persons will be healthier. Moreover, because more education raises wages, those with more education will invest more in health because being healthy and able to work will be more valuable.

Recently, researchers have developed an alternative model of the demand for health; it emphasizes several issues that, historically, had been largely ignored by health economists. This model focuses on the *complementarities* that affect the demand for health. Most important, those with a greater life expectancy will invest more in health and be

healthier than those with a lower life expectancy. This point is most easily illustrated in the context of the differences in health between the developed and less developed countries. Persons in less developed countries have relatively low life expectancy. They are more likely to be affected by a variety of illnesses and accidents and to die at a relatively young age. Therefore, their incentives to invest in health, the benefits of which occur in later life, are lower than for persons in more developed countries with higher life expectancy. A similar dynamic occurs between ages and between diseases. Raising the expected probability of surviving childhood increases the incentive to make investments that improve health at older ages. Advancements in treating one disease increase the incentive to make investments in health that decrease the probability of contracting other diseases.

In summary, the human capital model of the supply and demand of health provides a useful framework to analyze and explain observed differences in health and the potential value of health interventions. The human capital model of health is relevant to the most salient health policy issues such as racial and ethnic health disparities and how to improve the health of developing countries. Researchers have widely used the human capital model of health to assess the importance of different determinants of health, most notably medical care and education.

Supply and Demand of Healthcare Services

The second major focus of health economics is to analyze the market for healthcare services, in particular physician services and hospital markets. Kenneth Arrow wrote the seminal article for this topic in 1963, which provides an early description of what makes the market for healthcare services unique. Several aspects differentiate the health services market from the standard economic model: (a) the uncertainty of demand caused by the uncertainty of illness; (b) the absence of free entry and exit of firms; (c) the dominance of non-profit firms, particularly in the hospital industry; and (d) the nonobservability of quality of care. In sum, these factors clearly describe the ways in which the market for health services departs from the simple, competitive model of supply and demand.

Perhaps the most important departure from the competitive model is the fact that providers have market power—that is, competition does not drive the price of healthcare to marginal cost. Market power stems from several sources, with the first being the personal relationship between the patient and the provider. Patients may be comfortable with and trust a specific physician, making them reluctant to switch providers. This gives the provider some power to price above marginal cost, as consumers do not choose providers solely on the basis of price. In addition, market power stems from the patient's lack of information about his or her health and healthcare needs. The physician has better information about the patient's illness and treatment (quality and quantity of care) than the patient. The physician is the patient's agent, and this lack of information ties a patient to a provider. The physician is likely to have better information about the nature and type of illness than even the insurer, and therefore, even third-party payers cannot obtain prices that equal marginal cost. Finally, because information is costly to obtain, search costs are significant, and third-party insurance deters patients from obtaining better information about the prices and quality of providers.

The ability of providers to price above marginal cost is one of the most widely studied issues in health economics. Some of the narrower topics of interest in this area are (a) whether providers can induce demand (i.e., get consumers to use services that are unnecessary); (b) whether physicians respond to financial incentives in ways that are not clinically appropriate; (c) understanding the effect of competition, mergers, and concentration on physician and hospital prices; and (d) understanding the effects of government regulation on the prices, quality, and quantity of physician and hospital services.

The dominance of nonprofit firms in the hospital industry is also a major concern of health economics. Few other industries in the United States are characterized by a mix of for-profit and nonprofit firms as is the hospital sector. Health economics seeks to explain this characteristic of the market. There are several prominent explanations for the dominance of nonprofit hospitals. The first arises from asymmetric information, which has promoted a greater level of trust in nonprofit hospitals than in for-profit hospitals. Because the consumer does not

know his or her diagnosis, the optimal course of treatment, or the quality of care provided, the consumer may trust a nonprofit hospital more because it does not appear to have the same financial incentives to exploit this lack of information. While nonprofit status, therefore, is a signal of trust and implies higher quality of care, this explanation is inconsistent with the for-profit physician services market where information asymmetries are equally important.

The second explanation for the dominance of nonprofits is due to their provision of a *public good*. The positive externalities or social benefits associated with medical research, public health, and uncompensated patient care requires public subsidies. This explanation suggests that for-profit firms are only interested in profit and will not undertake the production of goods beneficial to the community, whereas nonprofits can make the production of these goods goals of the organization. This is inconsistent, however, with the absence of regulatory oversight about the nature of nonprofit hospitals' output (e.g., there is no requirement that uncompensated care be provided).

Finally, *cartel theory* or *interest group theory* has also been used to explain the dominance of nonprofit hospitals. This explanation is predicated on managers, physicians, employees, or other stakeholders running the hospital for their own gain (for-profits in disguise). Nonprofit status allows surplus or profit to be larger than in for-profit enterprises because of public subsidies that lower costs. Nonprofit status makes it easier to "hide" rent due to the diffuse nature of ownership where there are no explicit shareholders.

There is still much debate over which of these explanations is the most appropriate, and research suggests that there is little difference between for-profit and nonprofit hospitals in terms of the quality of care they deliver and the amount of charity care they provide.

Health Insurance

A third major focus of health economics is examining the demand for and consequences of health insurance. The uncertainty of illness is one of the most important features that characterize choices regarding health and healthcare. The study of insurance in health economics builds on a long

tradition in economics, dating back to Arrow's study in 1963, that studies the effects of uncertainty on economic decisions.

The demand for health insurance stems from the uncertainty associated with illness and disease. It is assumed that consumers are risk averse and that people prefer a sure bet to a risky outcome even if, on average, the two alternatives would leave the consumer equally well off. Consumers are, therefore, willing to pay to reduce risk; insurance is a good that reduces the financial risk—and to some extent the physical risk—associated with illness. Health economics uses this simple theory of insurance to analyze patterns of insurance and why people do or do not have insurance. Consumers are expected to purchase more health insurance as the potential loss from illness (i.e., the severity of illness) increases, as the uncertainty of illness increases, and as an individual's level of risk aversion increases.

There are two major issues that dominate the study of health insurance: *moral hazard* and *adverse selection*. Moral hazard is the term used to describe a change in consumer behavior due to insurance. In the context of health insurance, there are two types of moral hazards, *ex ante* and *ex post*. *Ex ante moral hazard* refers to taking action that changes the probability or severity of illness. Insured persons may invest less in preventing disease or the severity of disease because health insurance will pay for the costs of treatment. There is little study of the extent of *ex ante* moral hazard on the prevalence of illness. *Ex post moral hazard* refers to actions the consumer takes after contracting a disease. Insurance may lead them to consume more healthcare services than they otherwise would. The latter type of moral hazard raises the cost of insurance, which will cause some people to be uninsured. The extent and consequences of *ex post* moral hazard is one of the most widely studied issues in health economics.

Adverse selection refers to the view that consumers pay the wrong price for health insurance. From an economics perspective, the price that the consumer pays for health insurance should reflect the true risk of illness: Those with a greater risk of illness should pay more for insurance than those with a lower risk of illness, because those with a greater risk of illness could end up using more healthcare services. The risk of illness, however, is not fully

observable and this results in pricing such that some consumers, usually the healthy, pay relatively more for insurance and other consumers, usually the sick, pay relatively less for insurance. A consequence of adverse selection is that it—in addition to other factors—causes the price of insurance to be high, which may contribute to the numbers of the uninsured. Probably the most important reason why there are uninsured persons in the United States is that the price of insurance is often too high.

Future Implications

After nearly 50 years of analysis, many of the basic questions that are central to health economics remain largely unanswered. For example, there is still much debate over what determinants of health are the most important, and therefore, what accounts for differences in population health within and between countries. Related to this is the question of how population health affects economic growth. Will improvements in population health lead to faster rates of economic growth and subsequent improvements in health? How important is population health to economic growth? Similarly, there is relatively little, credible research on the consequences of competition in physician services and hospital markets. Does hospital concentration result in higher prices and lower quality of care, or does it lead to lower costs because of greater economies of scale? And it is still not known whether nonprofit or for-profit hospitals provide better care. In the near future, research in health economics will continue to try to answer these fundamental questions. Furthermore, in the future, health economics is likely to continue to integrate advances in medical science in the areas of genetics and neuroscience to improve and expand analyses of the supply and demand of health and healthcare services. Medical science may also change the landscape for health insurance as the risk of illness becomes more knowable.

Robert Kaestner

See also Economic Barriers to Healthcare; Healthcare Markets; Health Insurance; Market Failure; Moral Hazard; Nonprofit Healthcare Organizations; Public Policy; Supplier-Induced Demand

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HEALTH INDICATORS, LEADING

To create national policies to alleviate health problems, it is imperative to define what constitutes a healthy population. Before evaluating

health, those who are assessing health status must develop a mutually agreed on set of measurement tools. One of the best-known and most widely used sets of health indicators are those developed by the federal government's Healthy People 2010 initiative. The initiative identified a set of *leading indicators* based on their ability to initiate action and measure progress. Specifically, it defined 10 leading health indicators with the objective of measuring the health status of all individuals in the United States over the 10-year period from 2001 to 2010. The 10 leading health indicators are (1) physical activity, (2) overweight and obesity, (3) tobacco use, (4) substance abuse, (5) responsible sexual behavior, (6) mental health, (7) injury and violence, (8) environmental quality, (9) immunization, and (10) access to health-care.

Healthy People 2010

The Healthy People 2010 initiative is a broad set of health objectives for the United States to achieve over the first decade of this century. The initiative is designed to be used by many different population groups, communities, and professional organizations. The initiative attempted to develop various programs to improve population health. Healthy People 2010 identified leading health indicators that represent the major public health concerns the nation faces in the first decade of the 21st century. Each of the leading indicators depends on the information individuals have about their health.

Development of the Leading Health Indicators

Selecting leading health indicators involved a large interagency task force from the U.S. Department of Health and Human Services (HHS). Additionally, many associations and professional organizations provided comments and analysis at various task force meetings and communicated with it via e-mail and through the Internet. The National Academy of Sciences, Institute of Medicine (IOM) conducted a study, using scientific models, to support a given set of indicators. This systematic approach in determining the

leading health indicators legitimized the importance and significance of the resultant measures of the population's health.

The 10 Leading Health Indicators

1. *Physical Activity*

Physical activity is an important leading health indicator because it is crucial for maintaining a healthy body, enhancing psychological well-being, and preventing early death. In 1997, 63% of adolescents engaged in the recommended amount of daily physical activities: about 20 minutes of vigorous physical activity, 3 or more days per week. During the same year, 15% of adults engaged in the recommended amount of activity: 30 minutes of moderate daily physical activity, 5 or more days per week. The goal is to increase the proportion of the nation's adolescents and adults who engage in daily physical activities.

2. *Overweight and Obesity*

Being overweight and obese are major contributors to many preventable diseases (e.g., heart disease, stroke, diabetes, and hypertension). Higher body weights are also associated with higher mortality rates. Objectives for the future are to reduce the proportion of children, adolescents, and adults who are overweight and obese. Efforts to maintain a healthy weight must start in childhood.

3. *Tobacco Use*

Cigarette smoking is the single most preventable cause of disease and death in the United States: Smoking results in more deaths each year than AIDS, alcohol, cocaine, heroin, homicide, suicide, motor vehicle crashes, and fires combined. Objectives for the future are to reduce smoking rates in adolescents and adults.

4. *Substance Abuse*

Alcohol and illicit-drug use are associated with many of the nation's most severe problems. Alcohol abuse alone is associated with motor vehicle crashes, homicides, suicides, and drowning deaths. A current goal is to increase the number of adolescents

and adults who have not used these substances in the past 30 days. Another goal is to reduce the number of adult binge drinkers.

5. *Responsible Sexual Behavior*

Unplanned pregnancies and sexually transmitted diseases (STDs), including infection with the human immunodeficiency virus (HIV) that causes AIDS, can result from unprotected sexual behaviors. The current objectives are to increase the proportion of adolescents who abstain from intercourse or who use protection if sexually active. Another goal is to increase the proportion of sexually active adults who use protection.

6. *Mental Health*

About 20% of the nation's population is affected by mental illness during any given year. Of all mental illnesses, depression is the most common. Although mental health issues affect people of all ages, the objective here focuses only on adults because of the large quantity of available data. Adults and older adults have the highest rates of depression. In fact, major depression is the leading cause of disability and is the cause of more than two thirds of suicides each year. Depression is treatable with medication and therapy, and the goal for this indicator is to increase the proportion of adults who receive treatment.

7. *Injury and Violence*

More than 400 Americans die each day from injuries, primarily due to motor vehicle crashes, firearms, poisonings, suffocations, falls, fires, and drowning. Many factors that contribute to injuries are also associated with violent and abusive behavior such as low income, discrimination, lack of education, and lack of employment opportunities. The goals for this indicator are to reduce homicides and deaths due to motor vehicle crashes. Although these are the main goals, the initiative also aims to reduce unintentional falls, fire deaths, abuse, and assault.

8. *Environmental Quality*

An estimated 25% of preventable illnesses worldwide are attributed to poor environmental quality.

Two indicators of air quality are the ozone level and environmental tobacco smoke. The main objective is to reduce the proportion of individuals exposed to air not meeting the U.S. Environmental Protection Agency's health standards for ozone. Another objective is to reduce the proportion of nonsmokers exposed to environmental tobacco smoke.

9. Immunization

Immunizations can prevent disability and death from infectious diseases and help prevent the spread of infections within communities. The main objective is to increase the proportion of young children who receive all recommended vaccines and to increase the proportion of noninstitutionalized adults who are vaccinated annually against influenza and ever vaccinated against pneumococcal disease.

10. Access to Healthcare

Strong predictors of access to healthcare include having health insurance, a higher income level, and a regular primary-care provider or other sources of ongoing healthcare. The goals for this leading health indicator are to increase the proportion of individuals with health insurance and a source of ongoing care. Another goal is to increase the proportion of pregnant women who start receiving prenatal care in the first trimester of pregnancy.

Policy Implications

Equipped with the leading health indicators, which identify problem areas and emphasize their underlying factors, U.S. policymakers can likely better serve the health needs of the nation. To achieve certain health outcomes and to achieve the goals and objectives of Healthy People 2010, resources must be spent efficiently, effectively, and equitably. Research involving the leading health indicators will likely shape national healthcare policies for the future.

Jennifer Feld

See also Access to Healthcare; Health; Healthy People 2010; Mental Health; Preventive Care; Public Health; Public Policy; Tobacco Use

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- Public Health Indicators and National Data (PHIND): <http://www.communityphind.net>
- World Health Organization (WHO): <http://www.who.int>

HEALTH INFORMATICS

Health informatics is the science of evaluating, implementing, and utilizing technology to manage all information related to the patient care delivery process at all levels: clinical, financial, technological, and enterprise. It is a multidisciplinary field, drawing from health information and computer science, psychology, sociology, and engineering. The history of the term, itself, is relatively recent. The Russian engineer and information scientist Alexander I. Mikhailov (1905–1988) is credited with first defining, around 1968, the term *informatika* as the field that studies the structure and general properties of scientific information and the

laws of all processes of scientific communication. The English word *informatics* began to appear in the literature in the 1970s, and throughout the 1980s, the umbrella term *health informatics* emerged to encompass the continuum of information management, information science, and computer science focused on healthcare. When applied to a specific discipline, the application of informatics is focused on solving the problems of the discipline, such as medical informatics, nursing informatics, and public health informatics.

Types of Health Informatics

Health informatics encompasses many individual disciplines, which have further refined their foci in the field. For example, *bioinformatics* researchers develop or apply computational tools and approaches for expanding the use of biological, medical, behavioral, or health data. These tools include those used to acquire, store, organize, archive, analyze, or visualize such data. *Consumer health informatics*, on the other hand, is a subspecialty of medical informatics that studies the use of electronic information and communication to improve medical outcomes and the healthcare decision-making process from a patient or consumer perspective. Similarly, *dental informatics* expands the knowledge and understanding of the biological and biomedical processes in dentistry to improve prevention, diagnosis, treatment, and follow up of diseases through the examination of information handling and processing. Another type, *health sciences librarianship and informatics*, deals with health-related information, its structure, acquisition, and use. Health sciences librarianship and informatics are overlapping disciplines with strong conceptual links to the theoretical discipline of information science.

Also within the broad field of health informatics is *medical informatics*, the field that concerns itself with the cognitive, information processing, and communication tasks of medical practice, education, and research, including the information sciences and the technology to support these tasks. *Nursing informatics* is a related specialty that integrates nursing science, computer science, and information science to manage and communicate data, information, and knowledge in nursing practice.

Pharmacy informatics, on the other hand, focuses on medication-related data and knowledge within the continuum of healthcare systems, including its acquisition, storage, analysis, use, and dissemination in the delivery of optimal medication-related patient care and health outcomes. Finally, *public health informatics* is the systematic application of information and computer science and technology to public health practice, research, and learning.

Role of Professional Associations

Health informatics disciplines can be understood, in part, through the interests of the membership of their professional associations. As an example, the Healthcare Information and Management Systems Society (HIMSS), established in 1961, regularly holds an annual conference with published proceedings. At the 1999 conference in Atlanta, Georgia, the HIMSS attendees' foci of interest centered on the use of healthcare information systems in healthcare organizations from a business perspective, exploring ways to extract value from these systems. The conference also looked at the emergence of a number of healthcare goals, among them patient safety. By the 2007 conference in New Orleans, Louisiana, the HIMSS had added sessions on information technology standards and building stronger connections between operations and technologies. Leadership emerged as a new theme, and initiatives appeared in public policy and community health. The scope had expanded to better represent both technological and patient care perspectives. The business process focus on quality had merged with patient safety and risk management. Other emerging topics recognized the need for research in clinical informatics to identify effective and efficient clinical practices and the need for both privacy and security measures to protect healthcare data.

The innate dynamic nature of the field has challenged its ability to define the term *health informatics*. While examining nearly 800 articles retrieved by the general search term *health informatics*, researchers found that the articles were indexed by 10 common terms. Top among them were medical informatics, computer science, information systems, and healthcare sciences and services. Researchers used a set of six keywords that included the term

health informatics, and mapped conceptual changes over a period of 10 years in the MEDLINE literature database. The study found a consistent focus on healthcare, electronic medical records, and information technology topics in general.

Training and Skills

Despite its historical roots, however, it has been the emergence of academic programs across the nation that has brought some stability to the term *health informatics*. Throughout the 1990s, the rapid growth in the field led to a dearth of qualified individuals capable of guiding the development and implementation of healthcare information systems applications. System vendors and hospitals began to create formal employee positions for informaticists. Colleges and universities struggled with the creation of new curricula because they lacked a clear definition of the knowledge and skill sets necessary for individuals to work successfully in the field. Published in 1996, an examination of informatics competencies across the disciplines appeared to support a general trend: Those individuals involved in clinical informatics appeared to deal in detail with the ongoing support and development of applications, while those in health informatics appeared more focused on how applications and technology, both existing and proposed, would affect enterprise-wide production of and access to information; on management of that access; and on optimization of the information available.

By 1998, the Pew Commission recognized the effective and appropriate use of communication and information technologies as one of its 21 essential competencies for all health professionals. In 1999, the International Medical Informatics Association's (IMIA's) Working Group 1: Health and Medical Informatics Education published its *Recommendations of the International Medical Informatics Association (IMIA) on Education in Health and Medical Informatics*. In that same year, the American Medical Informatics Association's (AMIA's) spring conference used invited panels and structured breakout discussion sessions to focus on issues and predictions for health informatics education of three groups of health informatics: (1) researchers, (2) administrators, and (3) health professionals.

At the end of that spring conference, the committee's efforts concluded in the acknowledgment of the following 10 competencies as central to this diverse group of providers: (1) software use, such as presentation graphics, word processing, simple databases, e-mail, Internet searches, decision support applications, telemedicine, and home monitoring; (2) principles of interface design and human-computer interaction; (3) principles of privacy, confidentiality, and security; (4) ethical uses of information technology and ethical decision making in the digital age; (5) knowledge of terminologies, taxonomies, standards, and communication methods; (6) the importance of user-driven clinical systems and structured data to support evidence-based practice; (7) methods of evaluating information and information technology; (8) basic methods of software development—the process and how to get involved; (9) how to critically and efficiently process information; and (10) understanding the impact of technology use (and of its lack of use) on public health.

Researchers have recently reflected on three of these competencies when they described a number of core themes in health informatics: (1) establishing standardized definitions of data elements, standard languages, and commonly accepted vocabularies; (2) establishing standards for electronic data exchange; and (3) usability.

Future Implications

There is no question that the field of health informatics has grown in complexity, matching the growth in capabilities of healthcare computing. Healthcare has depended on computer technology to make important advances in the field, commencing in the 1950s—when most computer applications were for signal processing, images, and laboratory tests—through the 1970s, when the first clinical information systems emerged. Today, the social and organizational effect of technology acceptance is a major consideration. The term *health informatics* will continue to evolve, capturing the essence of the world of healthcare and information systems and incorporating ever-increasing subtleties within its definition.

Annette L. Valenta and Michael Dieter

See also Clinical Decision Support; Computers; E-Health; Electronic Clinical Records; Healthcare Informatics Research; Health Communication; Health Insurance Portability and Accountability Act of 1996 (HIPAA); Quality of Healthcare

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HEALTH INSURANCE

Many health services researchers study the function and nature of insurance, the various types of insurance plans, and the impact of insurance on healthcare. They also study the use of health services and the outcomes of care of the insured compared with the uninsured. Researchers use

this knowledge to develop more effective, efficient, and equitable health policies.

Health insurance plays a vital role in the U.S. healthcare system. Health insurance protects individuals and their families from the high and unexpected costs of injury and illness. It provides the insured with a measure of financial security. Health insurance may cover physician fees, hospital bills, prescription drugs, medical equipment, and long-term care expenses, as well as lost wages. Without health insurance, the costs of a serious injury or major illness could easily cause financial ruin for most individuals and families. In fact, medical debt is one of the leading causes of bankruptcy in the United States.

Health insurance is an important determinant of access to care. It enables the insured to have access to preventive healthcare services and to the early treatment of injury and illness. An overwhelming body of evidence shows that the uninsured get less medical care, get it later when it is of less value and usually more urgent, incur greater morbidity, and die younger than those with health insurance.

Health insurance is the largest source of revenue for nearly all healthcare providers in the nation. It enables healthcare providers to maintain high-quality care. Revenue from health insurance allows the providers to maintain their practices and organizations, and it enables them to purchase new advanced medical technology.

Function and Nature of Insurance

There are many definitions of insurance. Most of the definitions include such terms as *risk*, *pooling of risk*, *potential losses*, and *protection against losses*. For this entry, insurance is broadly defined as a form of risk management that transfers or shifts financial risk from an individual to a group such as a private insurance organization or a government agency, where losses are pooled and spread across the group.

Not all risks are insurable. A number of prerequisites are necessary for insurance to successfully work.

First, there must be a sufficiently large number of similar exposure units to make the losses reasonably predictable. Insurance is based on the law of large numbers. For example, it may be

impossible to predict with any certainty whether a specific individual will develop a rare disease or not, but by looking at a large population of individuals it may be possible to statistically predict the total number of individuals who will develop the rare disease.

The losses produced by the risk must be measurable in terms of its cause, time and place of occurrence, and its monetary value. The monetary value for most material things can be relatively easily determined. However, the monetary value of the loss of human life is much more difficult to estimate.

The losses must be fortuitous or accidental, and not intentional.

The losses must not be catastrophic. Insurance is based on the notion that only a small percentage of individuals will experience major losses, and that the losses will be shared across the group. If all individuals experience major losses, the insurance company would not be able to cover all the losses, and it may go bankrupt. An event such as a nuclear attack would be catastrophic and the losses it caused would be so great that it is not insurable.

Last, the cost of the insurance must be affordable. If the cost of the insurance is too high, and too few individuals can afford to purchase it, there may not be a sufficiently large group to share the possible losses.

Problems Faced by Insurance Organizations

Insurance organizations face two major problems: *adverse selection* and *moral hazard*. Adverse selection is the tendency of higher-risk persons or groups to buy and maintain insurance. For example, people with poor health may be more likely to seek health insurance coverage, while those with excellent health may not. To protect against this type of adverse selection, health insurance policies frequently exclude coverage for preexisting medical conditions. However, the federal Health Insurance Portability and Accountability Act of 1996 (HIPAA) now limits exclusions based on such conditions.

Moral hazard is sometimes divided into two categories: moral hazard and *morale hazard*. “Moral hazard” describes immoral or illegal conduct, while “morale hazard” describes

changes in attitude and behavior on the part of the insured. Submitting a fraudulent claim to an insurance organization is an example of moral hazard, while buying expensive designer frame eyeglass instead of cheaper less fashionable frames because insurance pays for them is an example of morale hazard. Morale hazard may also change the attitude of persons who are not insured. For example, a physician might hospitalize a person with a less than severe illness because the person has health insurance; but if the same person was uninsured, the physician might treat him or her on an outpatient basis, because the person could not afford the cost of hospitalization.

Major Classifications of Insurance and Key Terms

There are many types of insurance. Insurance can be broadly classified based on the particular risk it insures against (i.e., fire, flood, and wind damage) or by the nature of what it insures (i.e., auto, home, life, and health). Insurance can also be classified based on whether it is provided by a private organization or by a government agency. Insurance provided by a government agency is sometimes called *social insurance*.

A number of key terms are associated with insurance: premiums, deductibles, copayments, coinsurances, and maximum out-of-pocket expenses.

Premiums are the price of an insurance plan. In healthcare, premiums are based either on *community rating* or *experience rating*. In community rating, the premium price is based on the population or group in a geographic area, and it ignores any differences among subgroups. In contrast, in experience rating the premium price is based on differences in demographics, past healthcare utilization, medical status, and other factors of various groups. Generally, insurance premiums are cheaper under community rating.

Deductibles are the amount paid out of pocket for medical services each year before insurance begins to pay. Deductibles vary greatly. Some insurance plans have no deductibles, while others have a very high deductible.

Copayments are flat fees or percentages charged each time an individual visits a physician or uses a medical service. There may be a set amount for a

physician visit, a different amount for laboratory work, and various amounts for prescription drugs.

Coinsurances are requirements that individual policyholders must pay a percentage of the total cost of care. Individuals may have to meet deductibles before coinsurance begins.

Maximum out-of-pocket expenses are the most individual policyholder have to spend before all medical bills are covered. Out-of-pocket expenses include deductibles and copayments.

Types of Health Insurance Plans

Health insurance can be classified as being provided by either a private organization or a government agency. However, many people, especially the elderly, purchase both private as well as government health insurance coverage. The elderly often purchase private, supplemental health insurance, called *Medigap insurance*, to cover the costs or “gaps” not covered by government insurance such as Medicare. Also, some low-income elderly with limited resources are *dual eligible* and are covered by two government health insurance programs, Medicare and Medicaid. Below is a brief description of the major types of private and government health insurance in the United States.

Private Health Insurance

Private health insurance began in the nation during the Great Depression. At that time, many people could not afford healthcare, and hospitals were closing. In 1929, Baylor University Hospital in Dallas, Texas, contracted with local public school teachers to provide them with hospital care. For a prepayment of 50 cents per month, the hospital guaranteed that each teacher would receive up to 21 days of hospitalization in a semiprivate room, as needed. Similar plans began forming across the country. Ultimately, these plans became Blue Cross and Blue Shield organizations. With the growing success of the Blue Cross and Blue Shield, other commercial insurance companies also began to market health insurance. During World War II, when the federal government established ceilings on wages, many employers began offering their workers fringe benefits such as paid vacations, retirement benefits, and company-financed health

insurance. With the nation’s postwar prosperity, employers increasingly offered health insurance to their workers.

Most working Americans obtain their health insurance through their employers. Health insurance is generally part of the worker’s employment benefits package. Employers offer health insurance through the workplace because of the tax advantage of doing so, because of the increase in worker productivity that results from improved health, and because health benefits allow them to recruit and retain high-quality workers.

Most employers offer their workers a selection of health insurance plans to choose from. The plans tend to vary in their scope of coverage, the cost of the premiums, and the amount of coinsurance and deductibles they require. Employers and employees generally share the costs of the insurance. Health insurance obtained through work is typically group insurance. Group insurance usually costs less and offers more benefits than individual health insurance plans.

The health insurance plans offered by most large employers generally include indemnity insurance and various types of managed-care plans. The three major types of managed-care plans are (1) health maintenance organizations (HMOs), (2) preferred provider organizations (PPOs), and (3) point-of-service (POS) plans. And some employers are beginning to offer their workers health savings accounts (HSAs).

Indemnity or fee-for-service insurance is a traditional kind of health insurance. Today, this type of insurance is uncommon. Under this type of plan, the insured individual may go to any physician or hospital to receive care. After receiving the care, the individual or the healthcare provider sends the bill to the insurance company, which typically pays a certain percentage of the bill, after the individual meets the policy’s annual deductible. For example, fee-for-service plans may pay 80% of a medical bill, leaving 20% to be paid (coinsurance) by the individual. Most plans limit the amount that the individual must pay per year (i.e., the deductible) to, for example, \$500 per year maximum.

HMOs are prepaid health insurance plans. HMO members pay a monthly premium. In exchange, the HMO provides comprehensive care, including physician visits, hospital stays, laboratory tests, and therapy. HMOs include a variety of arrangements

but consist mainly of three types: (1) the *staff model*, (2) the *group model*, and (3) the *independent practice association* (IPA). Under the staff model HMO, healthcare services are provided by a group of physicians who are salaried employees of the HMO. Under the group model HMO, healthcare services are provided by a multispecialty group of physicians who are independent of the HMO but who contract with the HMO to provide services. Under the IPA, healthcare services are provided by private-practice physicians who contract with the HMO to provide care to HMO patients in a private office setting. In most HMOs, members are assigned or choose a physician who serves as their primary-care physician. The primary-care physician monitors the patient's health, provides basic medical care, and is also responsible for referring patients to a specialist and other healthcare professionals as needed. Most HMOs do not require a deductible each year, but they do generally require a small copayment for a visit. Because HMOs receive a fixed fee per member per month, they may provide more preventive healthcare services such as immunizations, mammograms, and physicals.

The most common type of private health insurance in the United States is the PPO. PPOs are generally less flexible than traditional health insurance plans but more flexible than HMOs. Individuals or members enrolled in PPOs may go to any physician (including a specialist) or hospital to receive care, but the coinsurance is higher for health providers who are not preferred providers. Preferred providers have contracts with PPOs, and they agree to provide PPO members discounts on the costs of their care. PPOs generally require their members to obtain prior approval before entering a hospital.

POS plans combine some aspects of HMOs and PPOs. POS plans provide a range of healthcare services. Like HMOs, POS plans use primary care physicians to coordinate patient care. Like PPOs, POS plans contract with healthcare providers to provide services to plan members. However, unlike PPOs, which require members to select a preferred provider in advance, PPOs plans allow members to choose at the time they need healthcare whether or not to seek care within the plan's network of care providers or to go outside the network for care. And like PPOs, if the member goes outside the plan, they will have to pay a higher coinsurance.

The costs of POS plans are generally higher than HMOs and PPOs, but the patient has greater freedom to choose healthcare providers.

A new type of health insurance that is beginning to be offered by employers is health savings accounts (HSAs). HSAs were signed into federal law in 2003. To open an HSA, an individual must have coverage from a qualified high deductible health plan (HDHP). The employer, the worker, or both can make contributions to HSAs. However, the total contributions are limited annually. Funds in HSAs are tax free, and they are completely portable, meaning that they can be kept if individuals change jobs, become unemployed, or change their marital status. Money in HSAs can be used to pay for routine health expenses, while the HDHP covers the costs of a serious injury or major illness. Money in HSAs can be saved for future medical expenses, and it can grow through investment earnings.

Although not generally covered by employers, another type of private health insurance is long-term care (LTC) insurance. LTC insurance covers care generally not covered by other types of private health insurance or government health insurance programs. It covers individuals with disabling injuries and illnesses such as spinal cord injuries, stroke, and Alzheimer's disease. Depending on the policy, LTC insurance can pay for home health care, adult day care, respite care, and nursing home stays. The cost of LTC insurance is typically based on the size of the policy and the age and health status of the individual. About 10% of Americans over the age of 55 have LTC insurance. In 2006, the U.S. Congress passed legislation authorizing changes in state laws allowing individuals to purchase LTC insurance that coordinates with the government health insurance Medicaid program.

Government Health Insurance

The first government health insurance program in the United States was *workers' compensation*, which was adopted by the individual states during the early 1900s. Every state has workers' compensation. Under the laws of each state, workers' compensation provides medical care and compensation, regardless of fault, for employees who are injured or disabled during the course of their employment.

The Social Security Act of 1935 established the Old Age, Survivors, and Disability Insurance (OASDI) Program, commonly known as Social Security. This comprehensive, federal benefits program includes retirement benefits, disability income, veterans' pensions, public housing, and the food stamp program. The U.S. Congress amended the Social Security Act in 1965 and included the Medicare and Medicaid programs. As part of the Balanced Budget Act of 1997 (BBA-97), Congress again amended the Social Security Act and included the State Children's Health Insurance Program (SCHIP).

Medicare (Title XVIII of the Social Security Act) is the federal healthcare program that covers almost everyone in the United States age 65 years or older, individuals under age 65 with certain disabilities, and individuals of all ages with permanent kidney failure requiring dialysis or a kidney transplant. Although Medicare coverage is comprehensive, it provides very limited LTC services.

Medicare consists of four parts: Part A (hospital insurance), Part B (medical insurance), Part C (managed-care plans), and Part D (prescription drug coverage). Medicare Parts A and B are sometimes referred to as "traditional Medicare."

Medicare Part A is hospital insurance. It helps provide basic coverage for hospital stays; posthospital, skilled-nursing facility care; home health care; and hospice care. Part A is financed by payroll taxes levied on employers and employees.

Medicare Part B is medical insurance that can be purchased by paying a monthly premium. It pays most of the basic physician and laboratory costs and some outpatient medical services, including medical equipment and supplies, home health care, and physical therapy. It also pays for some preventive services such as cardiovascular screening, diabetes screening, glaucoma tests, and prostate cancer screening for individuals joining Medicare for the first time.

Medicare Part C or Part C Medicare Advantage was formerly known as Medicare + Choice plans. Individuals with Medicare Parts A and B can voluntarily choose to receive all their healthcare services from Medicare managed-care plans, which are provided through private insurance companies.

Medicare Part D is a voluntary, prescription drug coverage program that can be purchased by paying a monthly premium. The program is

offered through private insurance companies. It helps pay the costs of prescription drugs. The Medicare Modernization Act (MMA) of 2003 established Part D for all individuals entitled to or enrolled in Medicare Parts A and B. It went into effect on January 1, 2006.

Medicaid (Title XIX of the Social Security Act) is a federal-state health insurance program for individuals and families with low incomes and limited resources. Although the federal government establishes broad guidelines for the Medicaid program, each state establishes its own eligibility standards, benefits packages, payment rates, and program administration. As a result, there are essentially 56 different Medicaid programs—one for each state, territory, and the District of Columbia.

Medicaid is the largest payer of LTC services in the nation, paying about 50% of the care being provided in nursing homes. Because Medicaid has strict financial eligibility criteria, it generally requires recipients to deplete their savings, or "spend down," before it will pay for nursing home services.

Medicaid does not provide medical assistance for all poor persons, unless they are in a designated eligibility group. All Medicaid programs are required to include certain eligibility groups, but they may also include other groups as well. All programs must include three groups: (1) the categorically needy (i.e., families who meet the states' Aid to Families With Dependent Children (AFDC) eligibility requirements, pregnant women and children under age 6 whose family income is at or below the federal poverty level, individuals receiving Supplemental Security Income (SSI), and individuals and couples in medical institutions with a monthly income with a certain monthly income level; (2) the medically needy (i.e., pregnant women through a 60-day postpartum period, children under age 18, certain newborns for 1 year, and certain protected blind persons, and special groups); and (3) special groups (i.e., Medicaid pays the Medicare premiums, deductibles, and coinsurance for certain individuals who are below the federal poverty level, qualified working disabled individuals, and LTC services for individuals who are Medicaid eligible and qualify for institutional care).

Medicaid programs generally cover physicians' services, inpatient and outpatient hospital care,

nursing facility services, prescription drugs, dental care, physical therapy, rehabilitation services, and hospice care. The programs also cover pregnancy and postpartum related services and early and periodic screening, diagnosis, and treatment (EPSDT) for children under age 21.

The State Children's Health Insurance Program (SCHIP) (Title XXI of the Social Security Act) assists states in providing healthcare services to uninsured, low-income children up to the age of 19. Like Medicaid, SCHIP is jointly financed by the federal and state governments and is administered by the states. SCHIP is designed to provide coverage to targeted low-income children. A targeted low-income child is one who resides in a family with income below 200% of the federal poverty level or whose family has an income up to 50% higher than the state's Medicaid eligibility threshold. However, states differ in terms of their eligibility requirements. In some states, SCHIP is part of the state's Medicaid program; in some states, it is a separate child health insurance program, while in other states, it is a combination of the two programs. States including SCHIP in their Medicaid programs must provide full Medicaid benefits. For states with separate SCHIP programs, the states must provide primary and preventive benefits, including immunizations, well-child care, and emergency services.

The federal and state governments offer a number of other health insurance programs, and they also provide healthcare services to specific groups. For example, the U.S. Department of Defense's TRICARE program provides healthcare services to active duty military personnel, retired members of the uniformed services, and their families. The U.S. Department of Veterans Affairs (VA) provides medical assistance to eligible veterans of the armed forces. The U.S. Department of Health and Human Services' Indian Health Service (IHS) provides healthcare services to American Indians and Alaska Natives. Many state governments operate or sponsor health insurance high-risk pools that provide coverage to those who are denied private health insurance because they have serious preexisting medical conditions (i.e., cancer, HIV/AIDS). A few states (i.e., Illinois, Maine, and Massachusetts) also have established new programs to expand health coverage to the uninsured.

Future Implications

Health insurance is important for individuals and their families, and for the nation's health-care delivery system. It protects individuals and their families from the high and unexpected costs of serious injury and major illness. Health insurance provides access to healthcare services. And health insurance is the largest source of revenue for nearly all healthcare providers. Many private organizations and government programs provide health insurance, but their insurance plans vary greatly in terms of benefits, coverage, and eligibility. In the future, as the costs of healthcare increase and the nature of American business practices continues to change, the number of employers offering health insurance will likely continue to decline. The ranks of the uninsured will increase. And federal and state government insurance programs will need to expand to cover them.

Ross M. Mullner

See also Blue Cross and Blue Shield; Employee Health Benefits; Health Insurance Coverage; Medicaid; Medicare; National Health Insurance; State-Based Health Insurance Initiatives; Uninsured Individuals

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HEALTH INSURANCE COVERAGE

Health insurance coverage includes an insurance policy of covered healthcare benefits and services between an individual and an insurance company. In the United States, most individuals receive health insurance coverage through their employer or the employer of a family member; however, being employed does not guarantee

health insurance coverage. Individuals who are 65 years of age or older, disabled, or have end-stage renal disease are eligible for health insurance coverage through the federal Medicare program; certain low-income individuals, families, and the disabled may be eligible for coverage through state Medicaid programs; children and families may be eligible for coverage through the State Children's Health Insurance Program (SCHIP); and individuals may purchase private insurance coverage on their own.

Background

Health insurance is key to accessing the healthcare system. Individuals who are insured are more likely to receive preventive, primary, and specialized care. The American system of health insurance coverage includes a patchwork of private sector and publicly funded programs. Approximately 160 million individuals have employer-sponsored health insurance and about 13 million individuals purchase health insurance directly through a health maintenance organization (HMO) or insurer. Although the majority of individuals have private, employer-based coverage, a growing segment of the population is uninsured. Since employer-sponsored insurance is voluntary by employer and employees, not all businesses offer coverage, individuals may not choose to purchase or be able to afford the health insurance offered by their employer, and some workers may not be eligible for coverage.

As the nation shifts from an industrial to a service-based economy and labor patterns change, health insurance coverage is diminishing. The nation's service industry tends not to offer health insurance coverage. Additionally, employers increasingly employ workers who do not qualify for coverage, such as part-time and contract employees. Because of this trend, fewer workers have employer-sponsored insurance. Many small employers are unable to offer their employees health insurance coverage because of the rising cost of healthcare. Employers that do offer health insurance to employees generally require them to pay a larger portion of the costs for their coverage. This increased cost-sharing burden has caused many employees to forgo employer-sponsored health insurance entirely.

Health insurance coverage in the United States differs greatly from that of other developed nations. For example, Canada, Germany, and the United Kingdom have national health programs that provide healthcare to all their citizens. However, rather than adopt a socialist model in which the government provides health insurance coverage for everyone, the United States has opted for a voluntary, market-based system in which individuals must seek out their own health insurance coverage, generally through an employer-sponsored plan.

In the United States, there are six types of voluntary health insurance: fraternal societies and mutual benefit associations; contract physicians; private physician plans; county medical-bureau plans; hospital service plans; and group insurance operated by private, commercial insurance companies.

Health insurance coverage grew out of the marine, fire, and life insurance policies sold by commercial insurers. The Civil War was a major impetus for the development of injury insurance, which eventually evolved into health coverage. Several major events—including the Stock Market Crash of 1929, the Great Depression, and World War II—also had an influence on establishing a health insurance coverage system in this country. The federal and state government support for health insurance was directly related to the economic conditions in the country.

Prior to 1920, health insurance was thought to be unnecessary because it was viewed as income replacement for working people. During the growth in the economy after World War II, employers began providing health benefits to their workers: Employee wages, which had been frozen during the war by the government, began to include fringe benefits such as pensions and health insurance. For employers, there was no payroll tax on health benefits, and employees did not have to pay income tax on the benefits provided by employers; both these amounted to government subsidies for employer-sponsored health insurance.

As the nation's hospitals expanded and modernized in the early 20th century, new expensive equipment and services developed. As commercial carriers were starting to introduce health insurance to their portfolio of products, the forerunner to the nonprofit Blue Cross plans was established in Houston, Texas, in 1929. This early plan provided

health insurance coverage for local teachers. From this early beginning, the Blue Cross plans developed across the nation with the support of the American Hospital Association (AHA).

Medicare, Medicaid, and the HMO Act

The urbanization of the nation and the growth in the retiree and indigent populations led to the introduction of the Medicare and Medicaid programs in 1965. Medicare is a federally administered program that provides health insurance coverage for those 65 years of age and older, the disabled, and individuals with end-stage renal disease. The Medicare program provides coverage for hospital care and nursing home care for 100 days through Part A, physician visits through Part B, and prescription drug coverage through Part D. Medicare's Part C offers coverage through private managed-care plans.

Medicaid, a joint federal-state program, provides insurance coverage for certain low-income individuals, families, and people with disabilities. Coverage through Medicaid is based on need, and eligibility is determined by income; the state-administered programs must meet broad federal guidelines, but each establishes its own eligibility requirements and service provisions.

The State Children's Health Insurance Program (SCHIP), created in 1997 by the federal government, represents the largest expansion of health insurance coverage for children since Medicaid started. Administered by the states, SCHIP provides health insurance coverage for children and for families with low incomes who earn too much to qualify for Medicaid.

With the continued growth in the nation's healthcare expenditures, a new form of insurance was introduced through the Health Maintenance Organization Act of 1973. This legislation required employers with 25 or more employees to offer a federally certified HMO as an option alongside the traditional indemnity insurance.

The federal Employee Retirement Income Security Act (ERISA) was established in 1974. It allowed private employers to self-insure, and it required employers to publish the rules and regulations that governed their benefit plans on an annual basis and report any modifications to the benefit packages. This measure was designed to provide protection to employees.

Changes in Health Insurance Coverage

In 2007, employer-sponsored insurance covered 59% of the nation's population, while the remainder of the population was either covered through Medicare, Medicaid, individual nongovernmental programs, or were uninsured. In recent years, the number of people who are covered by employer-sponsored insurance has been steadily declining, leading to a greater number of uninsured adults and children. It is estimated that about 47 million or 16% of Americans do not have any form of health insurance coverage.

From 2001 to 2005 alone, the percentage of workers covered by employer-sponsored insurance decreased by approximately 4%. Nearly half of this decline was due to the loss of employer sponsorship. In 2005, about 15% of employees did not have the availability of employer-sponsored insurance through their work site, and nearly 70% of the uninsured did not have access to employer-sponsored insurance through their family. Although there has been an increase in the number of Medicaid recipients and of others with public coverage or private nongroup coverage, an increase in working adults without health insurance coverage still remains.

Because of the rising healthcare costs in recent years, employers have been faced with either passing these additional costs on to employees or dropping employer-sponsored insurance entirely. As a result, employees have had to pay a growing share of premiums, their wages have increased more slowly, and they have lost coverage or decided not to take up employer-sponsored insurance.

Health Insurance Concepts

Several concepts are key to understanding health insurance coverage: plan type, risk, enrollment and disenrollment, eligibility for benefits, out-of-pocket expense, in- or out-of-network use, copayment, coinsurance, deductible, limitations on coverage, dependent coverage, preexisting condition, lifetime maximum coverage, premium payments, the Consolidated Omnibus Budget Reconciliation Act (COBRA) continuation, the Health Information Portability and Accountability Act (HIPAA), consumer protection, access standards, and appeals and grievances.

Plan type defines the nature of the insurance product under which a person is covered. It includes organizational entities or products such as HMOs, preferred provider organizations (PPOs), Health Savings Accounts (HSAs), indemnity, Medicare, and Medicaid, among others.

The *risk* falls on the individual or entity that is responsible for payment when services have been delivered.

Enrollment refers to membership in an insurance product or program when premium dollars are paid, whereas *disenrollment* means a transfer to a new plan or termination of coverage because of nonpayment.

Patients must meet *eligibility for benefits* or fulfill the membership criteria to participate in an insurance product or program.

Out-of-pocket expenses are services that are not covered by an insurance product or program and are, therefore, paid by the enrollee.

Each insurance product or plan provides coverage for a range of services; there is a negotiated contract that specifies the services included in the premium payment. Those providers—such as hospitals, physicians, and ancillary providers—that are included in a contract, are considered to be *in-network*, and so preferred rates are paid for those services. When a member goes to a provider who is not under contract with the insurance company, those services are considered to be *out-of-network*. Members will commonly have to pay a financial penalty for using an out-of-network provider.

Copayment refers to a provision in an insurance plan that requires members to pay some portion of the bill at the time of service, usually a flat fee dollar amount. For example, for a hospital emergency department visit, the member might have to pay a \$50 copayment at the time services are rendered.

Coinsurance, on the other hand, is a provision in an insurance plan that pays up to a given percentage of services and care. For example, the plan will pay 80% for services rendered; the member must then pay the remaining balance.

The *deductible* refers to the portion of a member's healthcare expenses that must be paid out of pocket before the insurer will pay the balance on the bill. For example, a health plan may specify that a \$500 deductible must be met before the insurer begins to pay for services.

Services not included in the insurance benefits are called *limitations on coverage*. For example, blood and blood products may not be covered for an inpatient surgical procedure.

Any person included on the insurance plan who is not the primary beneficiary of the insurance policy has *dependent coverage*. For example, spouses and children may receive dependent coverage through a family member's insurance plan.

Preexisting conditions, or medical conditions that the member had prior to the insurance effective date, are often excluded from coverage. For example, prior treatment for fibroids that could lead to a possible hysterectomy would not be covered under a new insurance plan.

The *lifetime maximum coverage* is when an insurance plan covers services up to a given limit and then will not provide additional payments once the threshold has been reached. For example, the plan may cover a maximum of 60 days of inpatient psychiatric services for the life of the insurance contract.

Premium payments refer to payments made on a monthly or quarterly basis to continue insurance coverage.

The *COBRA continuation*, a provision in the Consolidated Omnibus Budget Reconciliation Act of 1998, allows workers who have been displaced from their jobs to purchase insurance under their former employer's group health plan. COBRA coverage is usually available for 18 months postemployment.

The Health Insurance Portability and Accountability Act of 1996 (HIPAA) prohibits a former employer from refusing to provide COBRA to a displaced worker who has a preexisting condition. The HIPAA also has important patient-confidentiality provisions on sharing patient information.

State and federal government programs and commercial insurance plans recognize the need for *consumer protection*, establishing measures and policy provisions that allow members to appeal the decisions made by the insurer.

Each insurance company should have *access standards* or guidelines on administrative-support issues such as telephone waiting times, mailing of identification cards after enrollment, scheduling physician appointments, and receipt of specialist referrals.

The terms *appeals* and *grievances* are often used, mistakenly, interchangeably. An appeal is a

provision made after the insurer makes a decision and the member wants to challenge the decision. The appeal is usually conducted internally to the insurer but at a different organizational level. A grievance can include a host of comments that the member would like to make to the insurer, which can include issues with customer service, coverage, billing, or claims payment.

Future Implications

Health insurance coverage is an integral component of the American healthcare system. Private coverage and public programs such as Medicare and Medicaid shoulder some of the financial burden of the costs for routine and specialty healthcare services. As the number of uninsured Americans grows and the costs associated with healthcare continue to rise, the structure and function of health insurance coverage will shift and change. Public policy and current economic trends will help shape the future of health insurance coverage.

Diane M. Howard

See also Coinsurance, Copays, and Deductibles; Compensation Differentials; Employee Health Benefits; Employee Retirement Income Security Act (ERISA); Health Insurance; Health Insurance Portability and Accountability Act of 1996 (HIPAA); Medicaid; Medicare

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Henry J. Kaiser Family Foundation (KFF):

<http://www.kff.org>

HEALTH INSURANCE PORTABILITY AND ACCOUNTABILITY ACT OF 1996 (HIPAA)

The Health Insurance Portability and Accountability Act of 1996 (PL 104–191), commonly referred to as HIPAA, is federal legislation that mandates extensive requirements for group health insurance plans and medical providers. HIPAA significantly expanded the notion of privacy and the protection of individual patient records, it expanded protection of individuals with preexisting medical conditions from being denied healthcare coverage, and it allowed for the portability or transfer of individual healthcare coverage from one employer to another.

There are two titles of HIPAA. Title I protects health insurance coverage for workers and their families when they change or lose their jobs, commonly referred to as *portability*. Title II, the Administrative Simplification provisions, requires the establishment of national standards for electronic healthcare transactions and national identifiers for healthcare providers, health insurance plans, and employers.

After passing HIPAA in 1996, the U.S. Congress instructed the Department of Health and Human Services (HHS) to issue specific privacy guidelines to protect health information that was being sent and viewed electronically. The proposed rules were first written by the Clinton administration and then edited by the Bush administration. The final rules were issued in February 2003, and they took effect on April 14, 2003.

The HIPAA standards represent a national, uniform, federal floor of privacy protections for patients' medical information. Until the standards were passed, patients' medical privacy was governed by a spotty patchwork of state laws. The federal

standards now in place override weaker state laws but do not interfere with states that have adopted more aggressive policies to protect patients.

General Provisions

HIPAA was primarily intended to reduce employee barriers to maintaining health insurance coverage by guaranteeing that most of the nation's workers who change or lose their jobs will have access to coverage. The legislation also established new, federal, patient privacy rules to give individuals more control over how their personal, health information is used and disclosed. It requires health insurance plans and medical providers to have written privacy procedures, to train employees involved in handling protected information, and to establish a grievance procedure. Providers with direct treatment relationships are required to make a good-faith effort to obtain an individual's written acknowledgment that he or she is aware of the provider's privacy practices.

Title I

Title I of HIPAA regulates the availability and breadth of group and individual health insurance plans. It amended both the Employee Retirement Income Security Act (ERISA) and the Public Health Service Act. Title I prohibits any *group* health insurance plan from creating eligibility rules or assessing premiums for individuals in the plan based on health status, medical history, genetic information, or disability. However, this does not apply to *private* individual insurance. Title I also limits the restrictions that a group health insurance plan may place on benefits for preexisting conditions. Group health insurance plans may refuse to provide benefits relating to preexisting conditions for a period of 12 months after enrollment in the plan, or 18 months in the case of late enrollment.

Title II

Title II of HIPAA defines numerous offenses relating to healthcare and sets civil and criminal penalties for them. It also creates several programs to control fraud and abuse within the healthcare system. However, the most significant provisions

of Title II are its Administrative Simplification rules. Title II requires the HHS to draft rules aimed at increasing the efficiency of the healthcare system by creating standards for the use and dissemination of healthcare information. These rules apply to *covered entities* as defined by HIPAA and the HHS.

Covered Entities

Covered entities include health insurance plans; healthcare clearinghouses, such as billing services and community health information systems; and healthcare providers that transmit healthcare data in a way that is regulated by HIPAA. The Administrative Simplification standards adopted by HHS under HIPAA apply to any entity that is a healthcare provider that conducts certain transactions in electronic form, a healthcare clearinghouse, or a health insurance plan. An entity that is one or more of these types of entities is referred to as a covered entity in the Administrative Simplification regulations.

Privacy Rule

The Privacy Rule took effect on April 14, 2003, with a 1-year extension for certain small plans. It established regulations for the use and disclosure of *protected health information*. Protected health information is any information about the health status, provision of healthcare, or payment for healthcare that can be linked to an individual. This includes any portion of a patient's medical record or payment history.

Transactions and Code Sets Rule

There are multiple electronic data interchange (EDI) provisions in HIPAA. The Electronic Health Care Claim Transaction set is used to submit healthcare claim billing information, encounter information, or both. It can be sent from the providers of healthcare services to payers, either directly or via intermediary billers and claims clearinghouses. Other EDI provisions include guidelines for (a) pharmacy claim transactions; (b) healthcare claim payment transactions; (c) benefit enrollment; (d) payroll deductions and other group premium payments for insurance products; (e) healthcare eligibility and

benefit inquiry; (f) healthcare claims status requests and notifications; (g) service review information; and (h) functional acknowledgment, which is used to define the control structures for a set of acknowledgments to indicate the results of electronically coded documents.

Enforcement

The enforcement rule sets civil, monetary penalties for violating HIPAA rules, and it establishes procedures for investigations and hearings for violations. Failure to comply with the standards may result in severe civil and criminal penalties. The penalties range from \$50,000 to \$250,000 in fines and from 1 to 10 years in prison for an offense committed with the intent to sell, transfer, or use individually identifiable health information for commercial advantage, personal gain, or malicious harm.

Effects on Research and Clinical Care

In the wake of HIPAA implementation, there have been effects on patient trust in deciding to share their medical records. This may be the result of increased awareness of the need for privacy of personal medical records. It has been shown that those patients who have less trust in researchers are more likely to recommend a more stringent process for obtaining individual consent for the release of their medical records. Furthermore, with the advent of personal digital assistants (PDAs), many clinicians now keep patient medical records in electronic format on mobile devices. Physicians can improve their access to information by downloading patient data onto their personal handheld computers, which are available whenever decisions need to be made.

Implications for Marketing

A key provision in HIPAA includes a prohibition on marketing. The privacy rules specifically set new restrictions and limits on the use of patient information for marketing purposes. Healthcare providers, health insurance plans, and other covered entities must first obtain an individual's

specific authorization before disclosing their patient information for marketing. At the same time, the rules permit physicians and other covered entities to communicate freely with patients about treatment options and other health-related information, including health screenings, immunizations, and disease management programs.

Future Implications

HIPAA has provided for the portability of health-care insurance, increased the protection of personal medical records, and allowed for the migration to a set of standards for electronic data exchange of clinical information among patients, providers, and payers. However, there have been some negative effects on patients' willingness to share their personal medical records for research purposes based on their low level of trust that information is kept strictly confidential, despite the more stringent HIPAA regulations. It can be argued that patients are now much more aware of what is being done with their personal healthcare records and are, generally, better-informed consumers as a result. Finally, HIPAA has required that healthcare providers become more vigilant in the protection of personal patient information under their care.

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See also Centers for Medicare and Medicaid Services (CMS); Computers; E-Health; Electronic Clinical Records; Employee Retirement Income Security Act (ERISA); Fraud and Abuse; Informed Consent; Regulation

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American Medical Association (AMA): <http://ama-assn.org>

Centers for Medicare and Medicaid Services (CMS): <http://www.cms.hhs.gov/hipaaGeninfo>

HIPAA.ORG: <http://www.hipaa.org>

Office of Civil Rights (OCR): <http://www.hhs.gov/ocr/hipaa>

HEALTH LITERACY

Health literacy is considered a variation of functional literacy, and for that reason, many definitions of *health literacy* build on the definition of *literacy*: the ability to read and write and the quality of being knowledgeable in a particular subject or field. The Center for Health Care Strategies (CHCS) significantly extends the definition of literacy by adding the concepts of *understanding* and *action*; it defines health literacy as the ability to read, understand, and act on health information. The American Medical Association's (AMA's) Ad Hoc Committee on Health Literacy uses a slightly broader definition; it considers health literacy to be the constellation of skills required to function in the healthcare environment, including the ability to perform basic reading and numerical tasks such as the ability to read and comprehend prescriptions, appointment slips, and other essential health-related materials.

The national Institute of Medicine (IOM), U.S. Department of Health and Human Services (HHS), and the National Library of Medicine (NLM) define health literacy as the degree to which individuals have the capacity to obtain, process, and understand the basic health information and services needed to make appropriate health decisions. Some critics find this definition overly broad because it includes the individual's ability to obtain both health information and services. They argue

that the capacity to obtain services is more a function of resources than of literacy.

The World Health Organization (WHO) uses an even broader definition: Health literacy represents the cognitive and social skills that determine the motivation and ability of individuals to gain access to, understand, and use information in ways that promote and maintain good health. Health literacy means more than being able to read pamphlets and successfully make appointments. By improving people's access to health information and their capacity to use it effectively, health literacy is critical to empowerment. This definition emphasizes that it is not enough for people to have health information; they must also have access to healthcare. The WHO moves healthcare providers beyond providing health information to initiating the process of empowerment so that individuals can become active participants in their own healthcare.

Health literacy exists when health information and services are provided in a manner easily understandable and appropriate for their audience. An individual's health literacy skills depend on his or her culture, education, and language. Equally important are the skills of those who provide health information, such as health workers, the media, the marketplace, and government agencies. To maximize health literacy, it is crucial that those who provide health information and services align their skills, expectations, and preferences with those of the individuals who are seeking health information.

Measurement

The most commonly used measures of health literacy are the Test of Functional Health Literacy in Adults (TOFHLA) and the Rapid Estimate of Adult Literacy in Medicine (REALM). Both of these tests measure selected domains that are considered to be markers of an individual's overall capacity. The TOFHLA measures adult literacy in a healthcare setting; it assesses the individual's abilities in numeracy—the ability to use numerical information in printed materials—and reading comprehension. Its 17-item numeracy section measures an individual's ability to read and understand actual hospital documents and labeled prescription vials. The REALM is a 66-item test that measures the

domain of vocabulary. The TOFHLA and REALM are frequently used in research studies because they are relatively short and have been shown to predict knowledge, behaviors, and outcomes.

The health literacy component of the 2003 National Assessment of Adult Literacy (NAAL) survey, conducted by the U.S. Department of Education, provides a more comprehensive measure of health literacy. Twenty-eight health literacy tasks were added to the NAAL survey to measure respondents' skill in understanding and locating health-related services and information. These tasks address three domains of health and health-care information and services: clinical, prevention, and navigation of the healthcare system. The clinical domain addresses activities associated with clinical encounters, diagnosis and treatment of illness, provider-patient relationship, and medication. The prevention domain addresses activities associated with preventing disease, self-management of illness, maintaining and improving health, and engaging in self-care. Finally, the navigation of the healthcare system domain addresses activities associated with individual rights and responsibilities and understanding how the healthcare system works.

More instruments are needed to measure health literacy and to understand the skills necessary to successfully navigate the health system. This understanding will help guide efforts to educate individuals about health issues and to create health-related information better tailored to consumers. For research, instruments that more precisely measure an individual's reading fluency, without posing an undue response burden, are necessary. Additional studies are also needed to compare instruments such as the TOFHLA and REALM with more comprehensive tests such as the 2003 NAAL survey to better understand their strengths and weaknesses.

Prevalence

Limited health literacy skills are common among adults living in the United States. Results from the 2003 NAAL survey show that the majority of adults, 53% of the population, have *intermediate* health literacy; 22% have *basic* health literacy; 14% have *below basic* health literacy; and 12% have *proficient* health literacy. As defined by the

NAAL, health tasks that mapped to the *below basic* level required adults to locate straightforward pieces of information in short, simple texts or documents. Health tasks reflecting the *basic* level required finding somewhat more complex information in texts or documents that were longer. Tasks at the *intermediate* level required respondents to apply or interpret information that was presented in complex graphs, tables, or other health-related documents. Finally, health tasks that mapped to the *proficient* level required comparing and/or contrasting multiple pieces of information within complex texts or documents, drawing abstract inferences, or applying abstract or complex information from texts or documents.

Health literacy varies across demographic groups. Results from the 2003 NAAL survey show that the average health literacy score for women was 6 points greater than the average health literacy score for men. Results also showed that White and Asian/Pacific Islander adults had a higher average health literacy score than Hispanic, Black, American Indian/Alaska Native, and multiracial adults. Hispanic adults had the lowest average health literacy score of all the ethnic or racial groups assessed in the survey. The NAAL results also showed that adults who spoke only English before starting school had higher average scores than adults who spoke only a language other than English before starting school. Additionally, starting with adults who had graduated from high school or earned their GED (general equivalency degree), the average health literacy score increased with each higher level of educational attainment. Also, adults living below the federal poverty level had lower health literacy scores than adults living above the poverty level. Adults in the oldest age group, those 65 years of age and older, had lower health literacy scores than adults in any other age group.

Within the United States, a sizeable proportion of the adult population may not have the literacy skills needed to effectively use the healthcare system. Findings from the 1992 National Adult Literacy Survey showed that literacy was low among adults in the nation. An estimated 47% of the population had literacy skills that tested below the high school level, and of these adults, 40 to 45 million had trouble finding information in complex or unfamiliar texts, including medicine labels, forms, or newspaper articles. Despite these low

literacy levels, more than 300 studies of health-related materials, such as medication package inserts and informed consent forms, have shown that health-related materials are written in language that is far above the high school reading level. In fact, most of the studied materials exceeded the reading skills of the average high school graduate. Because of the disconnect between the high complexity level of health information and the low health literacy skills of its audience, a very large proportion of the nation's population is denied the full benefits of health information and services.

Effect on Health Outcomes

A number of studies have shown that low health literacy is associated with poor health outcomes. Compared with patients who have a higher health literacy level, those with limited health literacy and chronic illness have less knowledge of illness management, lower use of preventive healthcare services, and higher hospitalization rates. When compared with patients who have an adequate health literacy level, those with limited literacy have a lower adherence to anticoagulation therapy, lower self-reported health status, higher likelihood of poor glycemic control and retinopathy, and decreased ability to share in decision making about prostate cancer. Studies have also shown that low health literacy is a barrier to the treatment of sexually transmitted diseases and a potential contributor to depression.

Poor health outcomes in patients with low health literacy may be the result of inadequate disease knowledge. A study of diabetic patients in one clinic showed that 94% of the patients with adequate literacy levels knew the symptoms of hypoglycemia compared with only 50% of the patients with low health literacy levels. Similarly, women with low health literacy were found to have incorrect knowledge about the purpose of a pap smear, and pregnant women with low literacy had less knowledge and concern about smoking during their pregnancies.

Studies also suggest that low health literacy is associated with increased healthcare utilization and costs. For example, new Medicare managed-care enrollees with low health literacy were found to be twice as likely to be hospitalized as those with

adequate health literacy, increasing the demands they place on healthcare resources. Similarly, a study of a small sample of Medicaid patients found that individuals whose reading levels were at or below the third-grade level had average Medicaid charges \$7,500 higher than those of patients whose reading skills were above the third-grade level. Another study found that in 1996 there were \$29 billion in additional health expenditures attributable to inadequate reading skills, and that, if half of the individuals studied were also health-illiterate, the estimate would increase to \$69 billion.

Interventions

Several different interventions have been proposed and are under way to improve health literacy. Federal and state agencies, educational institutions, healthcare systems, professional associations, and community and advocacy groups have all attempted interventions in this area. Although many promising efforts are under way, few have been formally evaluated, and most of the interventions are single approaches that are not part of a systematic approach to increasing health literacy. To better understand which interventions are the most effective and appropriate, a greater understanding is needed of the causal relationship between health and education, the role of literacy, and the contribution of health literacy to health.

The national IOM's Committee on Health Literacy assessed the problem of limited health literacy and proposed a set of recommendations for improvement. The committee determined that health literacy is based on the interaction between an individual's health literacy skills, the healthcare system, the education system, and culture and society, and they, therefore, judged that the responsibility for health literacy improvement must be shared by these various sectors. Based on this view, it recommended an urgent increase in federal and nonfederal funds for health literacy research and the development and evaluation of new measures of health literacy.

The committee also recommended that (a) accreditation requirements for schools should mandate the implementation of National Health Education Standards and that demonstration programs should be funded to support state efforts to

achieve such standards; (b) professional healthcare schools should incorporate health literacy into their curricula and areas of competence; (c) public and private healthcare systems should develop and support demonstrations to identify the most effective ways in which the healthcare system can reduce the negative effects of limited health literacy; and (d) the National Committee for Quality Assurance (NCQA), Joint Commission, Centers for Medicare and Medicaid Services (CMS), and other accreditation bodies should incorporate health literacy into their standards.

Research

As recommended by the IOM, research to increase the understanding of health literacy and its effects on health outcomes is under way. In 2004, and again in 2006, the National Institutes of Health (NIH) and the Agency for Healthcare Research and Quality (AHRQ) released a Program Announcement with Special Review (PAR) titled "Understanding and Promoting Health Literacy." The goal of this program is to increase research on health literacy concepts, theory, and interventions. Specifically, the PAR encourages researchers to address health literacy and its relationships to chronic-disease management, patient-based healthcare, prevention, healthy living, health disparities, and cultural competence. The results of the research will help the NIH provide the public and healthcare providers with scientific health information. About \$9 million was awarded to fund 19 research projects from 2005 to 2009.

Healthcare Providers

Many proposed strategies for dealing with low health literacy focus on healthcare providers. Some approaches highlight the need for creating print materials in different languages and at varied reading levels that providers can distribute. Other approaches emphasize developing healthcare providers' skills in determining patients' health literacy levels and creating literacy-specific communication strategies that providers can adopt based on their assessments. Other solutions emphasize the role of providers in increasing awareness among all staff members about the prevalence of low health literacy among patient populations.

Providers are also recommended to adopt specific strategies to help their patients compensate for limited literacy. Such strategies include (a) asking patients to restate their understanding of the material presented; (b) identifying and using visual aids; (c) teaching in a step-by-step process, with the most important information presented first; (d) using simple words and phrases; and (e) avoiding complicated medical terms and jargon. Finally, healthcare providers are also instrumental in creating a shame-free environment in which patients with low literacy can feel comfortable admitting to their providers if and when they need help or do not understand. Training providers on the best ways to assist and approach those with limited literacy will also help patients feel comfortable with and trust their providers.

Health Information

Many interventions call for a decrease in the complexity of health information. Even individuals with strong literacy skills may have trouble obtaining and using health information and services because the signs, directions, and official documents (e.g., social service forms, public health information, informed consent forms, and health education materials) frequently use technical language and jargon that makes them very difficult to understand. The problem is worse for the estimated 90 million American adults who lack functional literacy skills. Measures can be taken to reduce the complexity of health materials and better match them to the literacy levels of the general public.

Recommendations for health literacy improvement addressed in the HHS's Healthy People 2010 initiative focus on two areas. First, health literacy can be improved by developing appropriate, written health material and by creating health communications that are culturally and linguistically appropriate; using plain language; and following the principles of organization, layout, writing style, and design used in professional publications and in federal documents. Second, it can also be achieved by improving the skills of persons with limited health literacy: by offering health literacy programs—at public and medical libraries; to voluntary, professional, and community groups; and in schools—that target skill

improvement for low-literacy individuals. By providing individuals with appropriate written materials and the training to use them, these recommendations should result in improvements in health literacy.

Education

The educational system can also play a major role in increasing health literacy. Childhood literacy education and childhood health education form a foundation for health literacy in adulthood. Although most elementary, middle, and high schools require students to take health education classes, requirements decrease, for the most part, as students get older. Nationally, 33% of schools require health education in kindergarten, 44% mandate it in the 5th grade, 10% require health education in the 9th grade, and only 2% of schools require it in the 12th grade. Without a coordinated health education program across grade levels, students likely do not learn the needed health literacy skills.

To address this issue, the Joint Committee on National Health Standards published the *National Health Education Standards* in 1995. In this publication, the committee details the knowledge and skills necessary for health literacy; the information and skills students should know and have in health education by the end of Grades 4, 8, and 11; and the framework for curriculum development and student assessment that will help achieve these standards. Although some progress has been made, these standards have not been widely achieved.

Future Implications

With its many definitions, roles, and measurement tools, health literacy influences not only understanding and communication but also health status and health outcomes. By focusing on its complex role in both medicine and public health, the nation's healthcare system can maximize health literacy's effectiveness at helping patients better manage their acute and chronic medical conditions, enable researchers to disseminate their new findings and recommendations, and allow the general public to shift its attitudes and health

behaviors. Although much progress has been made in understanding health literacy, much more work needs to be done.

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See also Access to Healthcare; Cultural Competency; Ethnic and Racial Barriers to Healthcare; Health Communication; Health Disparities; Healthy People 2010; Vulnerable Populations

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<http://nces.ed.gov/naal>
- National Institute for Literacy (NIFL): <http://www.nifl.gov>
- National Library of Medicine (NLM):
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<http://www.npsf.org/askme3>

HEALTH MAINTENANCE ORGANIZATIONS (HMOs)

A health maintenance organization (HMO) is a form of group health insurance that entitles enrollees to the services of participating hospitals, clinics, and physicians. While HMO premiums are usually prepaid, the structure of the provider network, method of reimbursement, and the scope of their utilization management and disease management programs can vary greatly between HMOs. Paul M. Ellwood coined the term *health maintenance organization* in 1970 as a way of describing an organization that would compete on the bases of price and quality by combining health insurance and healthcare in a single organization.

History

Health insurance began to appear in the United States around 1850. Initial coverage was limited to individuals who were disabled by accidental workplace injuries. The Western Clinic in Tacoma, Washington, began providing prepaid physician services for the lumber industry in 1910. A similar, prepaid program for providing medical care to lumber and mine workers was also started in Tacoma in 1917. However, this program was run through a county medical services bureau and not a single clinic or medical group. This program was later expanded to include 20 sites in Oregon and Washington.

With the beginning of the Great Depression in 1929, hospitals and physicians began to search for reliable methods to ensure reimbursement for their medical services. The Baylor Plan—the first Blue Cross plan—was started to provide hospital coverage for teachers in Dallas, Texas. During this period, a number of physicians pioneered the development of HMOs. For example, Michael Shadid started a rural, farmer's, cooperative health plan in Elk City, Oklahoma, in which he enrolled several hundred families for a predetermined fee and used the funds to build a hospital and provide physicians' services. Donald Ross and H. Clifford Loos (Ross-Loos Clinic) contracted with the Los Angeles Department of Water

and Power to provide comprehensive services for 2,000 workers and their families.

One of the most noted HMO pioneers was Sidney Garfield. Garfield was caring for the men building the Los Angeles aqueduct through the Mojave Desert in 1933. Many of the men did not have insurance, and payment was difficult for those that did. Garfield contracted with the insurance companies to prepay a fixed amount of five cents per day, per worker for coverage of their job-related, healthcare needs. For an additional five cents per day, non-job-related illness could also be covered. This funding mechanism also enabled Garfield to focus on maintaining health and job safety, in addition to treating illness and injury.

In 1938, as the aqueduct project was nearing completion, Garfield was asked by Henry J. Kaiser to provide care for 6,500 workers, who were building the Grand Coulee Dam in Washington, and their families. Garfield recruited a team of doctors to work in a “prepaid medical practice.”

With the outbreak of World War II, tens of thousands of new employees began working at the Kaiser Shipyards in Richmond, California. Kaiser was faced with the problem of how to meet the healthcare needs of nearly 30,000 people. Kaiser again called upon Garfield, who organized and ran a prepaid medical practice for the workers and their families. With the ending of the war in 1945, the shipyard’s employment dropped. Garfield and his physicians wanted to keep practicing their new form of healthcare delivery, and with the assistance of Kaiser, they opened the Kaiser Permanente Health Plan to non-Kaiser employees.

Throughout the 1930s and 1940s, several other prepaid, group practice plans developed across the country. Employees of the Federal Home Loan Bank organized the Group Health Association in Washington, D.C., in 1937. In 1945, unions and local supply and food cooperatives in Seattle, Washington, formed the Group Health cooperative of Puget Sound as a healthcare option. The Health Insurance Plan (HIP) of Greater New York was launched in 1947 to provide care to city employees and their families.

Each of these plans was structured and governed differently; however, each was committed to comprehensive and coordinated healthcare. Their coverage and benefits were more comprehensive than the prevailing health insurance of the time

with emphasis on preventive care, immunizations, well-child care, and other services not usually covered by other health insurance programs. In addition, enrollees were subject to few exclusions, limitations, or copayments.

Organized medicine—the American Medical Association (AMA) and state and local medical societies—were strongly opposed to prepaid plans and cooperatives. Throughout the 1930s and 1940s, organized medicine attempted to suppress the growth of group health plans and ostracized physicians who participated in them through boycotts and denial of hospital privileges. As a result, the AMA was indicted and convicted of violating the Sherman Antitrust Act for its efforts to suppress the new plans. The U.S. Supreme Court upheld this conviction in 1947. In spite of the conviction, the AMA’s campaign to impede the growth of prepaid, group practice succeeded via the passage of numerous state laws that required freedom of choice of physicians; restricted provider reimbursement methodology; and prohibited consumer-run, medical-service plans. As a result of the legal impediments and other barriers, prepaid healthcare remained a minor factor until the early 1970s when the accelerating healthcare costs and lack of access to care by the poor, minorities, and a growing number of uninsured brought cost containment and efficiency of care to the political forefront.

In 1971, just 5 years after the passage of the Medicare and Medicaid programs, the Nixon Administration announced a new health strategy to control skyrocketing healthcare costs—a strategy that would focus on preventive services and health maintenance. This led to the passage of the Health Maintenance Organization Act of 1973 (HMO Act), and was a significant attempt to change the underlying structure of the nation’s healthcare delivery system. While the goal of the legislation was to encourage integrated, prepaid, group practice, the AMA successfully lobbied for inclusion of an Individual Practice Association (IPA) Model HMO in the legislation. IPAs were loosely affiliated networks of mostly solo-practice, fee-for-service physicians that did not offer the integration of clinical services or acceptance of financial risk that characterized prepaid group practices.

The HMO Act set aside \$375 million to help develop HMOs; preempted state laws that banned prepaid groups; and required companies with at

least 25 employees to offer a federally qualified HMO, if the HMO asked to be offered. However, the HMO Act also imposed several conditions for federal qualification that placed federally qualified HMOs at a competitive disadvantage in the marketplace.

The HMO Act mandated (a) a comprehensive minimum-benefits package that included immunizations, preventive health exams, therapy services, low copayments, annual limits on the amounts patients could be charged through copayments, and no maximum lifetime benefit limitations; (b) an annual open-enrollment period, during which an HMO was required to accept all applicants, regardless of preexisting conditions (as a result, high-risk individuals had easier access to federally qualified HMOs than to any other insurer); and (c) premiums based on the cost of providing care to the entire community (*community rating*), rather than on the cost of providing care to a specific group or employer.

Although the HMO Act stimulated the growth of HMOs by providing planning grants and loan guarantees, removing legal impediments, and mandating their offering as an insurance option, their growth was inhibited by the administrative requirements and benefit mandates that placed federally qualified HMOs at a competitive disadvantage in the marketplace.

The HMO Act was amended in 1976 to limit the open-enrollment mandate to plans that had been operational for at least 5 years, had at least 50,000 enrollees, and were not operating at a financial deficit. However, community rating and generous benefit packages continued to prevent federally qualified HMOs from offering competitive rates to employers.

During the late 1970s and early 1980s, state legislatures began enacting their own HMO legislation. Most state legislation used the federal HMO Act as a foundation; however, state regulations initially imposed fewer administrative requirements (e.g., community rating), and benefit mandates (e.g., mandatory open-enrollment periods). As a result, fewer organizations sought the federal qualification status that subjected them to the restrictions of the HMO Act, electing instead to become state-licensed, prepaid health plans.

Federally qualified and state-licensed HMO membership in the early 1980s remained a small

proportion of health insurance coverage. However, their presence began to influence traditional health insurers' product design and benefit coverage. To compete with HMOs, traditional health insurers began offering coverage for preventive health services, immunizations, and pharmaceuticals. To make these plans affordable and keep costs down, insurers negotiated contractual relationships with providers that required price discounts and subjected reimbursement to preauthorizations and second opinions. These new relationships were the introduction of managed care outside traditional HMOs and led to the development of new types of health insurance programs such as preferred provider organizations (PPOs), exclusive provider organizations (EPOs), and point-of-service plans (POS).

Structures

The initial structures of HMOs were codified in the Federal Health Maintenance Act of 1973; however, to expand and remain competitive, some plans have evolved from one of the initial structures to a hybrid of several. There were three basic structures of HMOs as established in the HMO Act: the staff model, group model, and individual practice association model. However, by default there is a fourth model—the mixed or network model, which is a combination of the three basic models.

Staff Model HMO

In a staff model HMO, there is a single entity—the HMO. The HMO offers insurance to its members or enrollees. Most of the physician services are provided by physicians who are employed by the HMO and only see HMO members. Some specialty care may be provided by nonemployee specialists who are contracted by the HMO. The HMO may own and operate its own network of hospitals, or it may contract out for some or all its hospital services. There are only a handful of staff model HMOs remaining in the country. Group Health Cooperative of south central Wisconsin is an example of a local staff model health plan. For economic reasons, many of the former staff model HMOs have spun off their physicians into separate but affiliated medical groups. The medical groups

can then contract with additional payers and care for a larger patient population. Examples of former staff model HMOs would be Cigna Health Plan (originally Ross-Loos Health Plan) in California and Harvard Community Health Plan in Massachusetts.

Group Model HMO

The archetypical HMO—Kaiser Permanente—is often thought of as a staff model HMO; however, it is a group model HMO. Kaiser Permanente is a consortium of three distinct groups of entities: the Kaiser Foundation Health Plan, Inc. and its regional operating organizations Kaiser Foundation Hospitals and the Permanente Medical Groups. The health plan offers health insurance to members or enrollees. The physicians work for the Permanente Medical Group, and the Medical Group contracts exclusively with the Kaiser Foundation Health Plan to provide medical care to its enrollees. Therefore, the health plan is a group model HMO.

A group model HMO is not limited to only contracting with one medical group to form its network. A group model HMO can contract with a series of medical groups across a geographic region to form its network of physicians.

Individual Practice Association Model HMO

As discussed earlier, the Individual Practice Association (IPA) model HMO was lobbied for by the American Medical Associations as an option for private practice physicians to participate in HMOs. IPAs are loosely affiliated networks of small groups and solo-practice, fee-for-service physicians. IPA model HMOs manage care by forming virtual “medical groups” through risk pools, specialty capitation, and utilization review committees.

Mixed-Model HMO

To expand their capacity and geographic service areas, HMOs need to develop large physician networks. A mixed-model HMO is a hybrid of all the above models. The composition of its network will vary and likely include medical groups, IPAs, and independent physicians.

Reimbursement Methodologies

Any reimbursement methodology has the potential to influence behavior. Under any reimbursement strategy, there is an unstated reliance on the professional integrity of hospitals, physicians, and others to provide only medically necessary care, neither too much nor too little. However, any system of reimbursement can be manipulated to maximize financial gain for the provider, to the potential harm of the patient.

The initial method of hospital and physician reimbursement was *fee-for-service*, in which a provider was reimbursed for each service delivered. This methodology provides greater financial reward for delivering more services and does not encourage preventive care, which if effective, would ultimately lead to lower reimbursements. Fee-for-service reimbursement has the potential to encourage unnecessary medical visits, hospitalizations, surgeries, and diagnostic testing.

An alternative method of reimbursement is *capitation*, in which a provider (hospital, physician, or medical group) receives a fixed reimbursement for specified services during a defined period of time. As the reimbursement is fixed, the provider (hospital, physician, or medical group) does not receive additional payments for hospitalizations, surgeries, or diagnostic testing. Under capitation, the provider is best off financially by providing the fewest services possible and thus has the potential to encourage rationing of care or underutilization.

There has been a great deal of discussion regarding the method and timing of payment for health service coverage through HMOs. Most of the attention is focused on the prepayment of premiums or capitation for medical services. However, prepayment of premiums for insurance is the standard practice for nearly all types of insurance. The insured pays an insurer a predetermined amount of money to purchase defined insurance coverage for a specific risk or set of services (e.g., health, auto, fire, life). Prepayment of premiums by employers or individuals to health insurers has been and continues to be standard practice for fully insured (non-self-funded) products. Premiums are set based on actuarial estimates of the future year's costs of providing the health services. In the event that insurers underestimate the future costs, they incur a loss for

that year, which usually results in a larger increase in premiums the following year to compensate for the underestimate and to recoup the losses.

Although HMOs were envisioned to function as both the insurer and the provider of healthcare, very few HMOs currently operate as direct providers of healthcare. Most HMOs function exclusively as health insurers and have reverted to reimbursing physicians on a fee-for-service basis and hospitals on a case rate, percentage-of-charges, or daily-rate basis. A few HMOs continue to operate as an integrated system of insurer, hospital system, and physician group (e.g., Kaiser Permanente).

Some HMOs differ from standard health insurance in the way they reimburse healthcare providers. Staff model HMOs employ their own physicians and allocate a portion of the premium to cover the costs of providing physicians' services. In a group model HMO, such as Kaiser Permanente, the HMO (insurer) provides the medical group with a fixed monthly premium for each member to cover all the necessary physician services. If the HMO owns its own hospitals, it may allocate a portion of the premium to cover the costs of providing hospital care. If it does not own the hospitals, it may either capitate a hospital system to provide the care, or it may negotiate some other method of reimbursement, such as case rate (Diagnosis Related Group [DRG]), per-day basis (per diem) or on a percentage of billed charges.

In an IPA model HMO, networks of independent physicians organize into an IPA to accept capitated risk for physician services from an HMO. The IPA can then capitate primary-care and specialty physicians to provide care, or as an alternative, it can reimburse physicians on a discounted fee-for-service basis. The amount of the discount is adjusted based on the volume of services delivered to match the allocation of the premium—more services would require a greater discount. This model puts the IPA and independent physicians at risk for the high utilization of services and provides the potential for additional financial reward for lower utilization.

Future Implications

Since the passage of the HMO Act in 1973, there have been remarkable changes in the nation's health

insurance and healthcare. In response to competition from HMOs, health insurers expanded benefits to include preventive and pharmacy services. Kaiser Permanente attempted to expand outside its west-coast base with mixed results, but it continues to thrive. Most staff and group model HMOs that developed after the HMO Act, as well as old stalwarts such as Ross-Loos, have reorganized and been acquired by large insurance companies. Even with advances in computer technology—which allow for better coordination and analysis of medical claims, laboratory, diagnostic, and pharmacy data—there has been limited success in realizing Ellwood's vision of an HMO. Except for a handful of regional healthcare systems such as Kaiser Permanente, Intermountain Healthcare, and the U.S. Veterans Administration health system, Ellwood's vision of combining the delivery of health care with its funding to deliver improved quality and lower costs has yet to be realized.

Bruce A. Weiss

See also American Medical Association (AMA); Blue Cross and Blue Shield; Cost of Healthcare; Ellwood, Paul M.; Health Insurance; Managed Care; Medicare; Payment Mechanisms

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- MCOL: <http://www.mcol.com>

HEALTH PLANNING

The term *health planning* refers to conscious efforts to assess the current and future health-related needs of a population and identify ways to best meet those needs effectively and efficiently with limited resources. However, there is no consensus on this definition, perhaps because planning is a practice-based discipline rather than a theory-based one. It may also be due to the uneasy association many Americans have with government planning and to preferences for incrementalism and pluralism. Although doubtful about government power, people are also duly skeptical about the ability of the market to fully meet their health needs. Planning helps mediate this conflict of views.

The United States has a lack of health planning compared with most developed nations, including most of Europe, Canada, and Japan, where healthcare has a strong centralized government element and where there are long histories of top-down, government-oriented health services planning. Furthermore, health planning in these nations is often well integrated into social and economic planning, resulting in a comprehensive approach.

The nature and organization of American health planning has varied over time. In the late 1800s, epidemics led to attempts to reduce the environmental conditions that gave rise to illness. In the early 20th century, health planning was focused on medical care. Late in that century, there was a paradigm shift from "medical care" to "health-care" and a concomitant shift from medical-care planning to healthcare planning. Although health planning still includes medical and other health services, there is a focus on community-based planning and a renewed interest in shaping the urban environment to improve health.

Sanitary Reform Movement

In the late 1800s, American cities were growing rapidly, resulting in conditions that repeatedly led to epidemics. The sanitary reform movement responded based on the "filth theory": the idea that miasmas or "bad airs" either directly gave rise to illness or were associated with contagion. Miasma could be traced to the cesspools and sinks used to store human waste. It was believed that by removing the waste, disease could be checked.

Three tools were created that facilitated health planning. First, epidemiological mapping of the environmental conditions of streets and building as they correlated to the incidence of disease set the foundation for the planning process. This technique was used most notably by the public health reformer Edwin Chadwick (1800–1890) in the England of the 1840s and by the Citizens' Association in the New York of the 1860s. The second resource was sanitary sewerage technology that allowed solid waste to be carried away through pipes and sewers. Finally, the Progressive Era political reform led to the belief that government should effectively serve the public interest by tackling issues such as public health problems.

With these tools in place, sanitary survey planning developed as a response to a yellow fever epidemic in the Lower Mississippi Valley in the late 1870s. Tennessee authorities requested that the newly created National Board of Health develop a plan for the future and conduct a complete sanitary survey. They made a comprehensive reconstruction plan based on a house-to-house survey. It suggested specific, local-area remediation; designed a sewage system; and proposed

employing a sanitary officer. It also recommended the damming of bayous, the creation of public parks, repaving streets, and the enactment of a sanitary code raising buildings off the ground.

The sanitary reform movement also shaped urban designs and plans that were intended to prevent health problems by providing access to clean air and water and by reducing organic waste, ground moisture, and congestion. Frederick Law Olmsted (1822–1903), the father of landscape architecture, was influenced by this consciousness in his design of public parks such as Central Park in New York City. This influence can also be seen in Progressive Era housing reforms and in zoning codes that used police power to regulate land use for the protection of health, safety, and public welfare.

Toward Medical-Care Planning

By the early 1900s, germ theory was institutionalized in hospitals and the medical profession, following the Carnegie Foundation's Flexner Report—a survey of American and Canadian medical schools that resulted in the eventual closure of 29 medical schools between 1910 and 1914. With these changes, the nation's hospitals and the medical profession became much more effective than before.

In line with this newfound effectiveness, the nation's voluntary hospitals greatly expanded in the 1920s, but during the Great Depression, patients were priced out and turned to the overburdened public hospitals. This gave rise to the first voluntary regional planning agencies. These agencies were representative of the wealthy classes and worked to raise funds for hospitals. Health studies done during this period, before World War II, were usually not comprehensive but were directed toward specific health problems.

After World War II, the U.S. Congress passed the Hospital Survey and Construction Act of 1946, also known as the Hill-Burton Act. This act brought about the first public-initiated, statewide, health-planning bodies and significantly funded local, areawide, health-planning bodies with matching dollars, thus marking the beginning of federally sponsored health planning.

Catchment or hospital service areas were identified, the numbers of hospital beds needed by the population were calculated, the numbers of hospital

beds available were counted, and the extent of unmet needs estimated. These estimates of unmet needs were the basis for funding hospitals, which were then required to provide some level of charity care. Amendments in 1962 required the development of regional health-planning agencies, which were generally voluntary agencies that advised states. There were 8 agencies in 1962, 33 in 1964, and increased to 50 by 1965.

Federally Funded, Comprehensive Health Planning

In the 1960s, concerns over access to healthcare gave rise to the Medicaid and Medicare programs. Government became a major payer and the high cost of medical care became a focus. As a result, the federal government expanded its role in medical-care planning. First, the 1966 Partnership for Health Action established Comprehensive Health Planning (CHP) agencies. The National Health Planning and Resources Development Act of 1967 featured the work of these agencies. The act established local Health Systems Agencies (HSAs), State Health Planning and Development Agencies (SHPDAs) and included the Certificate of Need (CON) process intended to control the development and expansion of medical-care facilities and services.

Local HSAs were the basic unit of health planning, with about 200 nationwide. Consumers were mandated to have a majority of positions on their governing bodies. HSAs were required to develop long-range plans, with open public hearings, and to review facilities every 5 years. Quantitative analysis and a systems approach were encouraged. The early focus was on inpatient and long-term care, but in 1979, amendments added a focus on prevention, home health, and alcohol and drug abuse.

SHPDAs were overseen by Statewide Health Coordinating Councils, and they were expected to hold their deliberations in public. The functions of the SHPDAs included completing a state plan, coordinating with HSA plans, implementing portions of the state plan, and assisting the Statewide Health Coordinating Councils in their reviews of medical facilities.

As part of the process, CON applications had to be submitted for proposed new or expanded health facilities, equipment, or services. These were to be

reviewed on the basis of need as identified in the plans. Initially, the CON process had little impact on the availability of facilities, services, and equipment because health planning agencies were not given the power to enforce the decisions made on CON applications. Later, however, the impact of CON varied by state, with a significant effect in some and a limited effect in others.

Federally supported, CHP came to an end when the U.S. Congress repealed the National Health Planning and Resources Development Act of 1967 in 1986. President Ronald Reagan had campaigned for a reduced, more businesslike government, and healthcare costs continued to escalate despite health-planning efforts. The planning process had few supporters.

With the end of federal support, health planning at the national level has been almost nonexistent. One exception has been Healthy People 2010, sponsored by the federal Office of Disease Prevention and Health Promotion; it identified national healthcare goals in the late 1980s and later began tracking progress toward them. Many states retained health-planning structures, and some continue to develop state health plans. Most of these entities are voluntary and have little funding or regulatory power.

Today, health planning continues in a number of different forms but not always under the rubric of planning. These include institutional planning; community-based, problem-specific planning; local, public health agency planning; and an emerging focus on health in urban planning.

Institutional Planning

Most health planning today takes place in health-care organizations rather than at the community or regional level. Hospitals in the mid-1980s faced rapidly changing environments of competition, reduced reimbursement, and declining use. Strategic planning, which had been developed by banks, was well suited to the needs of hospitals. Strategic planning involves identifying a mission and strategies for achieving that mission, given internal and external constraints and opportunities. It does not prevent hospitals from addressing community needs, but overall, strategic planning is focused on the institution. Institutional planning also takes

the form of operations planning, facility planning, budget planning, and marketing planning.

Community-Based, Problem-Specific Planning

Just as funding for comprehensive health planning began to decline, the HIV/AIDS crisis appeared. Voluntary organizations were formed to respond, including the Citizens Commission on AIDS for New York City and Northern New Jersey and the AIDS Foundation of Chicago. At about the same time, a coalition approach to funding services was being developed by the Robert Wood Johnson Foundation: Successful applicants had to ensure some level of collaboration, often in the form of a coalition. This effort facilitated a structure for community-based planning or, at the very least, service coordination.

The federal government adopted this approach in HIV Health Service Planning Councils as mandated by Title I of the Ryan White Comprehensive AIDS Resources Emergency Act of 1990 (the CARE Act). The funded HIV/AIDS agencies used a unique type of planning organization, working as community-based, participatory-planning entities. Similar models of planning also are required in maternal-child health and many other federal-grant-funded programs.

Local Public Health Agency Planning

In the 1980s and 1990s, strategic planning was recommended for local public health agencies. The Assessment Protocol for Excellence in Public Health (APEX/PH) provided by the National Association of County and City Health Organizations (NACCHOs), had some strategic-planning elements. In 2001, Mobilizing for Action through Planning and Partnership (MAPP) was developed by the NACCHOs and the Centers for Disease Control and Prevention (CDC) to help public health agencies do community health planning and programming. MAPP includes elements from both strategic planning and comprehensive health planning.

Health in Urban Planning

Health planning is becoming broader in its scope as it seeks to shape the urban environment to

promote health. In 1986, the World Health Organization Regional Office for Europe (WHO/Europe) established the Healthy Cities project, which is designed to involve local government in health promotion. In 1997, it created the health, urban-planning initiative to integrate health- and sustainable-development planning.

Physical inactivity, a cause of obesity and related chronic health problems, has been targeted by the Active Community Environments (ACES) initiative from the CDC and by the Robert Wood Johnson Foundation's Active Living by Design initiative. Both of these initiatives support the development of environments that promote physical activity.

The spatial forms of cities can lead to health problems: Urban sprawl forces hours of driving time that make people inactive, pollute the air, cause injuries, cause stress, and take people away from activities that build protective social capital. Efforts to reduce urban sprawl and improve health include the New Urbanism, a set of principles that seeks to use participatory planning to create compact, walkable communities that are connected to their surrounding regions by public transit. Similarly, Smart Growth promotes the concentration of growth in urban centers, with mixed-use development and access by public transit. Both sets of principles are intended to guide urban planning in its application of land-use tools such as building codes, zoning codes, growth management, and public transportation systems. These close ties between urban form and health have led to calls for greater collaboration between the professions of public health and urban planning.

Future Implications

Health planning had its roots in shaping the environment to improve health. Although much of the history of health planning is dominated by medical and healthcare planning, there is an increasing focus on community-based planning and a renewed interest in shaping the environment to improve health status.

Curtis R. Winkle

See also American Health Planning Association (AHPA); American Public Health Association (APHA); Certificate of Need (CON); Healthcare Organization Theory; Health Systems Agencies (HSAs) Public Health; Public Policy; Regulation

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HEALTH PROFESSIONAL SHORTAGE AREAS (HPSAs)

Health professional shortage areas (HPSAs) are geographic areas, population groups, or medical facilities that are designated by the Secretary of the

U.S. Department of Health and Human Services (HHS) as having a shortage of health professionals. HPSAs may be lacking primary-care, dental, or mental health providers as judged by established norms for the provision of adequate healthcare.

Types of HPSAs

There are several types of HPSAs: geographic parts of a county or a whole county; geographic service areas with portions of one or many counties; population groups, such as low-income populations; state mental hospitals; correctional institutions; Federally Qualified Health Centers (FQHCs) and FQHC look-alikes; comprehensive health centers; rural health clinics; American Indian, Alaskan Native, and Indian Health Service clinics; and “other,” including public or private nonprofit medical facilities. Additional classification criteria include geography, demographics, or institutions.

Scope of Coverage

About 20% of the population of the United States resides in primary-medical-care HPSAs. Because the demand for services exceeds the available resources, residents of these areas have inadequate access to primary-healthcare services. Approximately three of five White Americans outside metropolitan areas live in HPSAs, compared with three of four African American and Hispanic minorities. Furthermore, 84% of counties where African Americans or Hispanics constitute the majority of the population qualify as HPSAs. In 2008, there were 5,987 primary-care HPSAs, 3,951 dental HPSAs, and 2,947 mental health HPSAs in the nation.

Designation

Designation as an HPSA indicates eligibility for federal-grant funds, placement of practitioners from the National Health Service Corps (NHSC), and Medicare reimbursement bonuses to physicians in efforts to enhance healthcare provision. To bolster healthcare, foreign physicians are encouraged to practice in selected HPSAs by waiving restrictions on entry into the United States.

The Shortage Designation Branch within the Bureau of Health Professions (BHPPr), which is part of the Health Resources and Services Administration (HRSA), administers the designation of HPSAs. Different criteria are set for primary-care physicians, dentists, and mental health professionals in determining need. For population group requests, applicants must describe the barriers that the population experiences in accessing quality healthcare services in the community. Areas with low clinician-to-population ratios are also eligible for designation, along with areas where there is restricted access to services due to language or cultural barriers. The latter include areas where private practitioners do not accept Medicaid patients and areas with a high proportion of Native American residents or other population groups with limited access to care. The scoring for primary care takes four factors into account: (1) population-to-primary-care-physician ratio, (2) percentage of the population with incomes below 100% of the federal poverty level, (3) infant mortality and low-birth-weight rates, and (4) travel time or distance to the nearest available source of healthcare. Local data on the population density, travel time and distance from the population-weighted center of the primary-care service area, percentage of users living below the federal poverty level, and primary-care physicians are used to calculate the scores.

The NHSC scholarship and loan repayment programs, the NHSC Ready Responders Program, and the Federal J-1 Visa Waiver program use the HPSA scores to allocate resources. The NHSC, a component of HHS and HRSA, is dedicated to providing primary-healthcare clinicians to HPSAs. It has supplied more than 27,000 clinicians since 1972. NHSC scholars are required to fulfill their commitments by serving in HPSAs with the greatest need. For the NHSC loan repayment program, which has the largest pool of clinicians, contracts are approved in descending order of the HPSA score. Most J-1 Visa Waiver physicians are placed through the Physician Visa Waiver Program (also known as the State Conrad 30 programs, called the State 30 program because it is limited to 30 foreign-medical-graduate waivers per state), which are not subject to the scoring restrictions. Therefore, the score should have a limited impact on recruitment opportunities for most entities. All HPSA

designated entities can seek the assistance of NHSC in providing physicians, nurse practitioners, physician assistants, certified nurse-midwives, dentists, and other clinicians, with placement priority based on scoring.

Future Implications

The number of HPSAs has grown during the past 20 years, as has the ratio of practitioners-to-population in these areas. Such changes can be attributed to the efforts of the federal government to widen the scope of HPSA designation to include factors other than physician-to-population ratios, and thereby provide improved and more equitable healthcare to underserved populations. In the future, it seems likely that the number of HPSAs in the nation will continue to grow.

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See also Access to Healthcare; Health Resources and Services Administration (HRSA); Inner-City Healthcare; National Health Service Corps (NHSC); Physicians; Primary Care; Public Health; Rural Health

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Health Resources and Services Administration (HRSA): <http://www.hrsa.gov>

HEALTH REPORT CARDS

Health report cards are collections of health-related measures developed to report and highlight specific health-related information. Health report cards can include measures of individual or population health status, measures of healthcare system or healthcare provider performance, and other health-related information. The content of health report cards is typically arrayed in a manner that displays a point-in-time snapshot of health-related measures pertaining to particular health concerns, populations of interest, geographies, or healthcare providers. Current measures are usually arrayed to allow comparisons with previous time periods. In some instances, the health report cards also use defined criteria or methodologies for grading, scoring, or ranking the health information conveyed, resulting, for example, in reports of the relative healthiness of the 50 states, the relative performance of healthcare providers, the deadliest health threats or risks, or changes in health status related to established benchmarks or objectives. The scope and format of health report cards can range from basic comparative measures familiar to consumers to more advanced sets of metrics useful for health services research and public policy development. Report-card-like information sources are becoming increasingly available on the Internet, with features that include query tools for rapid, focused information retrieval.

A variety of entities have developed health report cards for numerous distinct purposes. Government agencies at the federal, state, and local levels not only collect and store health-related data but often also disseminate health-related information in report-card-like publications for the public. Advocacy and consumer groups focused on specific populations or health issues frequently use a health report card format to present information. Healthcare providers and health benefits plans provide patients and plan beneficiaries with personal reports designed to promote the patient's health and care management. Professional associations and accreditation and certification entities have also developed report cards that portray changes in measures designed to reflect the quality of healthcare.

Types of Health Report Cards

Health report cards are produced for various purposes and can include equally varied content. Report cards often include metrics developed to allow ratings, using grading schemes with standards or benchmarks, or rankings portraying a spectrum of *best to worst*. Report cards can also focus primarily on factors measured at points in time and show trends in change. Health report cards vary widely depending on the intended audience: The content and format of reports devoted to informing health services researchers, for example, are quite different from that of report cards intended to support patient awareness and consumer healthcare decisions.

Health report cards can be grouped by general types depending on the scope, purpose, and content of the report cards. These groupings include report cards focused on personal health, population health status, subpopulation health status, healthcare provider performance, and health system capacity and performance. Within each grouping, the content displayed in a particular report card can concentrate on health measures within or across geographical boundaries or portray distinctions on the basis of age, gender, ethnicity and race, level of education, income, provider type, or particular health concerns.

Personal Health Report Cards

Personal health report cards can be produced by healthcare providers and health benefit plans to depict individual health status and related health-determinant information for individual patients and health plan beneficiaries. Personal health report cards are useful tools for engaging individuals in their own healthcare decision making and health-promoting behaviors. Additional uses of personal health report cards can include advancing patient health literacy; encouraging health risk avoidance; and ensuring culturally competent, patient-centered care. An individual's health report card requires current data that reflect the health issues of concern for that particular individual: For example, body weight, body mass, blood pressure, and cholesterol levels should be augmented with prenatal care measures for an expectant mother, disease-specific measures for a person with one or

more chronic medical conditions, and appropriate measures for a person at risk of developing health problems due to their family health history.

Population Health Status Report Cards

Population health status is a common feature of many health report cards. Rates of incidence and prevalence related to morbidity, mortality, and determinants of health are frequently used to develop measures that compare and contrast population health at different points in time or in different geographical areas. These report cards are particularly useful in demonstrating progress, or the lack thereof, in meeting benchmark objectives related to population health status goals. Population health status report cards are also useful in reaching conclusions regarding the priority health issues of a population and the success or failure of public programs in protecting and improving the population's health.

Subpopulation Health Status Report Cards

Health report cards that focus on the health status and healthcare system experiences of a particular population group or groups are useful in comparing the status of that group with the status of other groups and the general population. Population groups can be segmented in terms of ethnicity and race, age, gender, place of residence, level of education, participation in particular health benefit plans, or other attributes. Such report cards can demonstrate serious disparities in health and access to appropriate healthcare and are useful in supporting public policy development and program implementation. Population subgroup report cards are often hampered by data limitations such as inadequate ethnicity, race, and gender detail and the small numbers of cases or individuals, which may prohibit the use of the available data due to accuracy and privacy concerns.

Healthcare Provider Report Cards

Health report cards that describe and compare provider performance measures have gained attention as providers focus on quality improvement, consumers focus on the relative quality of care delivered by healthcare providers, and payers focus

on maximizing value and containing costs. Development of healthcare provider report cards gained momentum during the 1990s, partly in response to the need for metrics to support the evolving managed-care and managed-competition initiatives of that decade. Currently, provider performance reporting and the availability of reports are components of the efforts to enhance transparency in the delivery of healthcare services, improve the quality of care and contain costs, and link provider payments to value-based criteria.

Common elements of healthcare provider report cards include measures designed to reflect the structures, processes, outcomes, and costs of healthcare delivery. Healthcare provider health report cards can be produced by healthcare facility trade organizations, consumer and advocacy groups, and government entities. These report cards are often presented in sophisticated Web-based formats featuring query capabilities for focusing on the performance of particular providers in specific locations during recent time periods. To maintain accuracy and equity in measuring and comparing provider performance, provider report cards should acknowledge the important distinctions in the types of providers, and they should contain explanations of the risk adjustment methodologies used to compensate for variations in the volume, severity, and complexity of the cases treated by those providers.

Health System Capacity and Performance Report Cards

Health status, both of the individual and the population, results from a complex and dynamic context of health determinants. Healthcare is an equally complicated enterprise. Broad, system-level reports and report cards are developed to support assessment of the capacity and performance of systems for facilitating the interplay of health-related programs and care providers. For example, reports based on the state, local, or national government assessment tools of the National Public Health Performance Standards are very valuable for raising awareness of public health system capacity and priority issues. Similarly, reports on the overall healthcare system of a region, state, or community are essential for identifying quality improvement concerns and informing

resource allocation decisions. The importance of health system capacity reporting has gained attention recently with the realization of system vulnerabilities and the potential surge in demands for healthcare services that would follow cataclysmic events such as a bioterrorism attack or natural disaster.

Data Sources for Health Report Cards

Health report cards rely on a variety of primary and secondary data sources. The strengths, limitations, and utility of health report cards are determined by the quality and timeliness of the data used, the underlying assumptions and techniques of any data analyses, and the methodologies employed to develop the measures included in the report. Health report cards should include disclosure of the data sources and methodologies for development of the metrics, and report card users should understand the distinction between the data and the report card's metrics, which use the data to portray changes and relationships.

All health report cards are hampered to some extent by certain data limitations. In provider performance and population health status report cards, for example, small numbers of events or categories of characteristics can lead to statistical inaccuracies and potential privacy violations. Statistical techniques to aggregate data, such as merging data collected over longer time periods, can be employed in some instances, but report cards should carefully explain the data limitations and methodologies at a level appropriate for the targeted audience.

Data for report cards pertaining to an individual's health characteristics and health status can be drawn from a patient's medical records and basic health profile, often with a focus on family health history and lifestyle choices such as smoking. Personal health report cards often include some population level data in measures used for comparison of the individual with the general population.

Population-based health report cards commonly depict information in terms of estimates, rates of disease incidence, or other measurements that require census data, such as that obtained by the U.S. Census Bureau's decennial census and intercensal-population estimates.

Survey data are another critical data resource for population health report cards; for example, the Current Population Survey, conducted by the U.S. Census Bureau, and the Behavioral Risk Factor Surveillance System (BRFSS), conducted by the states with support from the Centers for Disease Control and Prevention (CDC), are valuable sources of useful, survey-based estimates related to healthcare and determinants of health.

Most states and the federal government require extensive healthcare provider reporting of clinical and administrative data. Government entities, such as the Centers for Medicare and Medicaid Services (CMS) and the National Center for Health Statistics (NCHS), collect data on hospital discharges, claims data related to publicly funded healthcare plans, public health data such as vital statistics and reportable infectious diseases, reports of adverse health events in clinical settings, and regulatory data pertaining to providers and health insurance plans. These mandatory submissions are a rich source of data for health report cards, and many government entities produce or are developing provider report cards to inform consumers and payers.

Future Implications

The value, utility, and future evolution of health report cards depend on several factors. The primary purpose of all report cards is to translate data into understandable information and convey that information so that it becomes useful knowledge. It is essential in all cases that the underlying data be accurate; that underlying assumptions be reasonable and unbiased; and that the information, purpose, and format of the report card be comprehensible to the target audience. It is also critical that any report card contain explanations of the methods used to derive the measures portrayed and that the report card relate the measures included to the broader universe of information that is not included. The report card should also contain specific caveats detailing the limitations of the data, metrics, or general use of the report card.

Health report cards that are constructed with careful attention to accuracy, timeliness, health literacy, and cultural competency can be valuable and constructive tools for expanding useful knowledge and, ultimately, improving the health status

and healthcare of individuals and populations. Health report cards can translate complicated concepts into comprehensible information suitable for dissemination methods that favor rapid and efficient forms of communication. The utility of health report cards in decision support, education, advocacy, and continuous quality improvement will increase as data sources and data analysis methods improve.

Health report cards in a wide variety of formats will most likely continue to proliferate and become essential knowledge management tools in the years ahead, as growth in the demand for reliable, understandable health information accelerates. The demand for health information will be fueled by evolving efforts to measure, manage, and improve health status and healthcare delivery. Factors influencing this demand will include improved levels of health literacy in society, broader acceptance of the individual's growing role in decisions related to the management of his or her healthcare, and growing concern for continuous improvement and accountability in healthcare delivery. The general pressures of expanding scientific and medical knowledge, progress in technical innovation, the promise of more robust data sources, and expanding social awareness of health issues will also contribute to the demand for useful health report cards.

Numerous factors will undoubtedly continue to drive the future demand for health report cards as well as the forms those report cards will take, including the following: increasing efforts to bring transparency to the delivery of healthcare services and inform better public policies; continuing efforts to enable informed consumer choice and patient and family participation in healthcare decisions; incentives for improving the continuity and management of care, especially with regard to chronic-disease conditions; initiatives to raise the level of health literacy and promote healthy lifestyle behavior and the avoidance of health risks; and continuous work to improve the quality of healthcare.

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See also Centers for Medicare and Medicaid Services (CMS); Health Literacy; Joint Commission; Leapfrog Group; Outcomes Movement; Quality Indicators; Quality of Healthcare; Volume-Outcome Relationship

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- U.S. News and World Report: <http://www.usnews.com>

HEALTH RESOURCES AND SERVICES ADMINISTRATION (HRSA)

The Health Resources and Services Administration (HRSA) is one of 11 agencies in the U.S. Department

of Health and Human Services (HHS), making it a component of the executive branch of the federal government. HRSA's major focus is on ensuring access to healthcare for the uninsured and other vulnerable populations and providing people with appropriate services at the appropriate times. Pursuing that mission involves funding programs to train, recruit, and retain clinicians to work in underserved areas and encouraging individuals from underrepresented groups to enter the health professions and providing the financial means for them to do so. By establishing the infrastructure to expand access to healthcare, HRSA works to eliminate health disparities.

History

With the passage of federal Titles V and VI of the Social Security Act in 1935, the federal government, through the U.S. Public Health Service, began providing grants to the states for healthcare programs. By 1943, both the Bureau of Medical Services and the Bureau of State Services were created within the U.S. Public Health Service, which at the time was part of the Federal Security Agency (FSA). A decade later, the FSA became the U.S. Department of Health, Education, and Welfare (DHEW).

By 1966, the Bureau of Medical Services and the Bureau of State Services were transformed into the Bureau of Health Services and the Bureau of Health Manpower, respectively. At the same time, the Community Health Center program was instituted, followed by the National Health Service Corps, which began in 1970.

In 1973, the Health Services Administration and the Health Resources Administration were established. In essence, the Bureau of Health Services became the Health Services Administration, while the Bureau of Health Manpower became the Health Resources Administration. Finally in 1982, the Health Services Administration and the Health Resources Administration merged to create the Health Resources and Service Administration (HRSA). This was just 2 years after the U.S. Department of Health, Education, and Welfare (DHEW) was reorganized into the U.S. Department of Health and Human Services (HHS).

Organization

Today, HRSA's staff of more than 1,600 individuals is headquartered in the Washington, D.C., suburb of Rockville, Maryland. The administrator of HRSA oversees 6 bureaus and 12 offices with an estimated fiscal year (FY) 2008 budget of \$5.8 billion. The 6 bureaus are (1) the Bureau of Health Professions (BHP), (2) the Bureau of Primary Health Care (BPHC), (3) the Healthcare Systems Bureau, (4) the HIV/AIDS Bureau, (5) the Maternal and Child Health Bureau, and (6) the Bureau of Clinician Recruitment and Service.

The BHP focuses on issues related to the healthcare workforce, including the education of underrepresented minorities in the health professions and the recruitment and retention of clinicians to work in underserved areas. This bureau houses the National Health Service Corps (NHSC) and the National Practitioner Data Bank.

The BPHC identifies underserved areas across the country and provides those areas with increased access to primary care. To this end, the most notable program housed in the BPHC is the Consolidated Health Centers Program, which includes Federally Qualified Health Centers (FQHC), Migrant Health Centers, Rural Health Centers, and others.

The Healthcare Systems Bureau leads several efforts and oversees a variety of diverse HRSA programs, including the vaccine injury compensation program; organ transplantation program; efforts to reduce the number of uninsured individuals; and support of state and local efforts at emergency management, disaster planning, and bioterrorism response.

The HIV/AIDS Bureau houses the Ryan White Comprehensive AIDS Resources Emergency (CARE) Act Program, providing funding to grantees for HIV/AIDS outreach; AIDS Drug Assistance Programs (ADAPs); and other efforts aimed at increasing access to healthcare for individuals who are uninsured or underinsured and living with HIV/AIDS.

The Maternal and Child Health Bureau (MCHB) provides national leadership on issues relating to women's and children's health, including access to healthcare, programs designed to care for children with special healthcare needs, and other similar programs. This bureau administers Title V grant

funds—to grantees at the state and local levels—that are used to fund programs such as Women, Infants, and Children (WIC).

The Bureau of Clinician Recruitment and Service (BCRS) supports the education of students and clinicians through scholarship, loan repayment, and recruitment programs.

Advisory Committees

HRSA is also involved in several committees that advise the HHS and the U.S. Congress on healthcare matters. In the area of workforce development, it is part of the Council on Graduate Medical Education, the National Advisory Council on Nursing Education and Practice, and the National Advisory Committee on the National Health Service Corps. Members of HRSA also serve on the National Advisory Committee on Rural Health and Human Services, the National Advisory Council on Migrant Health, the Advisory Committee on Organ Transplantation, the Centers for Disease Control and Prevention (CDC)/HRSA Advisory Committee on HIV and STD (sexually transmitted disease) Prevention and Treatment, the Advisory Committee on Childhood Vaccines, and the Advisory Committee on Heritable Disorders and Genetic Diseases in Newborns and Children.

Strategic Partnerships

HRSA also partners with other government agencies and organizations at the federal, state, and local levels. For instance, together with the CDC, HRSA targets preventive care for chronic diseases in underserved communities, assists in emergency preparedness and bioterrorism response planning, and strives to find solutions to the HIV/AIDS epidemic. The agency's Office of Pharmacy Affairs implements the federal 340B Drug Pricing Program to provide access to low-cost prescription drugs for federally funded grantees and other safety net providers. HRSA also works closely with the Agency for Healthcare Research and Quality (AHRQ), the Indian Health Service (IHS), and the Substance Abuse and Mental Health Services Administration (SAMHSA). At the state level, HRSA partners with public health programs such as those administered under the Title V Maternal and Child Health Block Grant and the Ryan White

CARE Act. Locally, HRSA provides grants to community-based organizations such as hospitals, health centers, and academic institutions.

Grants and Funding Opportunities

HRSA is primarily a grant-giving and oversight agency. That is, the majority of its budget goes to providing grants and other funding in support of external organizations that pursue the agency's mission through education, training, and research. These grantees include community-based organizations, colleges and universities, hospitals, local and state governments, associations, and foundations. In a typical year, community-based organizations, hospitals, and universities account for more than three fourths of the total funding disbursed by HRSA.

The various bureaus of HRSA administer a number of scholarship and loan programs to health professionals in training to encourage them to pursue a career working in an underserved area, as well as to increase the representation of minority populations and the teaching of cultural competency in health profession schools. Scholarships and loans are awarded to students in medicine, nursing, dentistry, optometry, veterinary medicine, pharmacy, podiatric medicine, public health, chiropractic medicine, the allied health professions, behavioral and mental health, and physician assistants who are from disadvantaged backgrounds. HRSA's loan repayment programs repay certain student loans in exchange for fulfilling a service obligation by working in an underserved area upon graduation. The best-known loan repayment program is part of the National Health Service Corps.

Healthcare Workforce and the Designation of Underserved Areas

One of HRSA's primary missions is ensuring that an adequate supply of clinicians exists in the country to provide needed care. Currently, there is both an absolute shortage of clinicians per capita as well as a maldistribution of clinicians across the country. To target clinician placement, HRSA's National Center for Health Workforce Analysis designates geographic areas and population groups as being medically underserved.

Receipt of such a designation is typically a prerequisite to qualifying for most grant programs administered by the agency and is also used by other programs outside HRSA. More than 34 federal programs rely on HRSA's designation of the medically underserved in making their funding decisions.

There are two general classifications: Health Professional Shortage Areas (HPSAs) and Medically Underserved Areas or Populations (MUAs or MUPs). HPSAs include urban or rural geographic areas and populations with a shortage of primary-care, dental, or mental health providers. If an area or population has more than 3,500 persons per provider, it is considered to be underserved and is classified as a HPSA. If an area has a ratio of 3,000:1 and can also demonstrate unmet need in the population, it too is classified as a HPSA.

In contrast, MUAs and MUPs rely on an Index of Medical Underservice (IMU) to determine an area's or a population's status. The IMU yields a score ranging from 0 (completely underserved) to 100 (least underserved). A score of 62.0 or below qualifies for MUA designation. The IMU itself is calculated based on the ratio of primary-care physicians per 1,000 population, the infant mortality rate, the percentage of the population below poverty, and the percentage of the population age 65 and older.

National Health Service Corps

The National Health Service Corps (NHSC) exists to ensure that healthcare providers are available to serve in the most underserved areas of the country. The NHSC acknowledges that even if a clinician is dedicated to caring for underserved populations, it can often be unfeasible for them to do so without additional incentives for a variety of reasons. To recruit clinicians to serve in these areas, the NHSC operates both a scholarship and a loan repayment program; both of these initiatives entail a service obligation upon graduation that requires the clinician to work in an underserved area for a length of time depending on how much assistance he or she received while in school. There are currently more than 4,000 active NHSC clinicians providing care to nearly 4 million U.S. residents.

Health Disparities Collaboratives

Beginning in 1998, HRSA established a national network of Health Disparities Collaboratives (HDC) to gather evidence of improved health outcomes among disadvantaged populations and to use these data to implement new evidence-based practices. Using the Chronic Care Model, the HDC seeks to address medical conditions that are the most expensive for community health centers to treat or for which a large number of patients are seen at the center. These conditions included diabetes, cardiovascular disease, asthma, cancer, and depression. More than 450 federally funded, community health centers have participated in the HDC since the program's inception.

Data Collection and Availability

HRSA maintains a variety of data—related to healthcare access, clinician workforce, and related sociodemographic factors—accessible through its geospatial data warehouse. Most notable among these are the Area Resource File (ARF), the National Practitioner Data Bank (NPDB), and the Health Centers Uniform Data System (UDS).

The ARF is a national database of county-level health resource information, combining data from more than 50 varied sources such as the American Medical Association's Physician Masterfile, the U.S. Census Bureau, and the CDC. Taken together, these data make the ARF one of the most comprehensive sources of county-level health resource data and include demographic data, indicators of need, and provider availability.

The NPDB is a national repository of information collected on clinicians, with a focus on those who are reported to HRSA as having acted without integrity in their profession. State medical boards and other entities report this information to the NPDB to identify clinicians who have behaved unprofessionally, paid an excessive number of malpractice suits, or had their license revoked and have moved from one state to another.

The UDS collects data on all the programs in the Consolidated Health Centers Program. By law, all programs receiving federal grant funding from HRSA's BPHC are required to submit annual UDS reports. The data reported include information about the health center's governing board and operating

staff, characteristics of the population served, services the program provides, and the financial performance of the organization. The bureau then uses these individual reports to compile aggregated data at the state, regional, and national levels. HRSA also uses the UDS data to monitor the performance of individual health centers and their compliance with federal laws as well as to evaluate the program as a whole in support of the annual budget requests submitted to the U.S. Congress.

Further Implications

HRSA plays an essential role in increasing access to healthcare for underserved areas and populations by funding projects; expanding opportunities for health professionals; and providing health information and data to agencies, researchers, clinicians, and the general public. In the future, the efforts of HRSA will continue to be important, especially with the federal goal of eliminating health disparities.

Brad Wright

See also Access to Healthcare; Community Health Centers (CHCs); Federally Qualified Health Centers (FQHCs); Health Professional Shortage Areas (HPSAs); Health Workforce; National Health Service Corps (NHSC); National Practitioner Data Bank (NPDB); Vulnerable Populations

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 U.S. Public Health Service (USPHS): <http://www.usphs.gov>

HEALTH SAVINGS ACCOUNTS (HSAs)

Health savings accounts (HSAs) are a relatively new phenomenon in the United States. HSAs are tax-advantaged savings accounts for individuals who are enrolled in high-deductible health plans. HSAs came into existence with the passage of the Medicare Modernization Act of 2003 (MMA). The MMA, federal legislation that introduced a pharmacy benefit for Medicare enrollees, also included provisions for private, fee-for-service health plans. These private health plans are under the consumer-directed health initiatives.

Overview

In 1984, John Goodman—the president of the National Center for Policy Analysis and an early proponent of initiatives to allow individuals to take control of their healthcare expenditures—began advocating for consumer-directed health plans. He wrote numerous newspaper articles and gave speeches at national meetings on the potential benefits of allowing private citizens to manage their own healthcare rather than ceding control to insurers and providers. He also went to the U.S. Congress and gained legislative support from both Democrats and Republicans to examine alternatives to the existing employer-sponsored health insurance plans.

In the 1990s, healthcare expenditures in the country appeared to be under control with the introduction of managed care. During this time, there were numerous commercial plans that entered the health insurance business and expanded their offerings to include managed care. Insurers soon found that healthcare was a difficult business in which to operate, and they eventually sold off their

health divisions to insurers that planned to stay in the healthcare business. Aetna, Cigna, and UnitedHealth are examples of commercial insurers that stayed in healthcare, along with the Blue Cross and Blue Shield plans.

In the late 1990s, healthcare expenditures started to rise again when health maintenance organizations (HMOs) and managed-care products fell into general disfavor. Insurance subscribers were looking for better options than the restrictions imposed by HMOs and managed care. The HSAs, included in the MMA, seemed to meet the need for cost controls that the insured person could manage, and it provided an alternative for the non-Medicare population.

Provisions of HSAs

The Internal Revenue Service (IRS) developed guidelines for HSAs in its 2004 tax year documents. To enroll in an HSA, individuals must have a trustee—either a bank, employer, or the IRS. The advantages of HSAs include (a) the ability to claim a tax deduction; (b) the ability to exclude the amount put into the HSA from gross income, if the amount is contributed by an employer; (c) the contributions can remain in the account until the money is used; (d) the interest accrued on the account is tax free; (e) the contributions are portable and can be moved, if there is a job change; (f) the monies can be transferred to an heir; and (g) the funds can be used for nonhealthcare purposes by paying income taxes.

The prospective HSA member enrolls with an IRS-designated trustee. The enrollee pays into the plan on an annual basis. The contribution is up to a given deductible amount not to exceed \$2,600 for an individual and \$5,150 for a family. The HSA member can contribute these amounts each year until the close of the tax year, which is April 15. When the HSA member files his or her taxes for the preceding year on the Form 1040 U.S. Individual Income Tax Return, he or she must also file the Health Savings Account Form 8889. When enrolling in a HSA, the enrollee must designate a beneficiary in case of death so that the account can be transferred to an heir.

As of January 2008, there were an estimated 6.1 million HSA enrollees in the nation. Health insurers see HSAs as an opportunity to expand their product lines. However, insurers are receiving competition from banks, credit unions, and money management firms; they see these accounts as a financial vehicle, and many have registered to become trustees. This competition from the financial industry has caused some insurers to purchase banks, as evidenced by UnitedHealth's acquisition of Exante Financial Services and the Blue Cross Blue Shield Association's charter of the Blue Healthcare Bank, owned by 33 Blue Cross and Blue Shield companies.

The verdict is still out on the possible success of HSAs. Patients have to pay out-of-pocket costs until they reach their deductible limit. After the deductible threshold is reached, providers then bill the HSA. Providers need the billing expertise to complete the transaction and patients need the education to use HSAs appropriately.

Some have criticized HSAs because they tend to attract a more affluent and educated population who are more willing to take responsibility for their own health. This takes a healthy population away from insurance pools leaving those who are less healthy and less willing to take responsibility for their health, which increases the premium dollars for those left in the insurance pools. While HSAs move the responsibility to the individual, the account does nothing to control healthcare costs. The individual takes advantage of the insurer's negotiated rates, but this does not address the cost escalation in healthcare. The enrollee has to manage with these predetermined rates. Yet for those HSA members who remain vigilant and mindful of their healthcare purchases, the HSA may work well.

Future Implications

In the future, the number of individuals enrolled in HSAs will likely increase. Many employers want to limit their exposure to healthcare insurance costs, and a number of healthcare proposals are being advanced to promote the private healthcare marketplace. They are concerned about the rates of obesity, diabetes, and

high blood pressure in the population that, in many cases, can be successfully managed if individuals begin to accept responsibility for maintaining their own health through wise decision making. With the support of employers, insurers, and some of the general public, HSAs may continue to expand as an alternative insurance option.

Diane M. Howard

See also Blue Cross and Blue Shield; Coinsurance, Copays, and Deductibles; Compensation Differentials; Consumer-Directed Health Plans (CDHPs); Cost of Healthcare; Health Insurance; Health Maintenance Organizations (HMOs); Managed Care

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<http://www.opm.gov>

HEALTH SERVICES RESEARCH, DEFINITION

Today, health services research (HSR) is a recognized and well-respected field of investigation, supported by numerous government agencies, foundations, health plans, and insurers. The products of its research are widely used by policymakers; regulatory agencies; healthcare providers; health plans; insurers; and increasingly, by the general public. In 2001, the Association for Health Services Research, the predecessor to the AcademyHealth, adopted its currently accepted definition:

Health services research is the multidisciplinary field of scientific investigation that studies how social factors, financing systems, organizational structures and processes, health technologies, and personal behaviors affect access to healthcare, the quality and cost of healthcare, and ultimately our health and well-being. Its research domains are individuals, families, organizations, institutions, communities, and populations. (Lohr and Steinwachs, 2002, pp. 7–9)

The definition of HSR has changed and evolved over time reflecting the capacity of the field to address the increasingly complex array of health services, the role of preventive as well as curative services, and the impact of services on both individuals and populations. In 1979, a National Academy of Sciences, Institute of Medicine (IOM) report titled *Health Services Research: A Report of a Study* stated: “Health services research is inquiry to produce knowledge about the structure, processes, or effects of personal health services” (p. 14). The early and current definitions substantially overlap. The earlier definition was understandable to researchers who produced HSR but likely not very understandable to the wide range of HSR users and the public. The current definition should be clearer to users of HSR and is more encompassing, recognizing the importance of social factors and personal behaviors on the use of health services and health outcomes. The definition identifies specific characteristics of the health services that are of particular importance, including access to care, quality, cost, and their contribution to

health and well-being outcomes. These characteristics are to be examined and understood for individuals and for populations. The linkage of individual and population health forms an explicit bridge between medicine and public health and between health service interventions at both the individual and population or community levels. These changes in the definition document the changing vision for HSR and for health services.

In the following sections, a brief history of the field is provided, followed by a discussion of the basic concepts and tools of HSR.

History

Looking back over the history of the field, it can be seen how HSR has changed to reflect the growing breadth of understanding of the factors affecting health and the increasing scope and effectiveness of health services.

HSR traces its beginnings back to the 1920s and initiatives by philanthropic foundations to improve the living conditions of the poor. In the 1950s, the first legislation was passed by the U.S. Congress to support studies of health services. The name *health services research* was initially applied in the mid-1960s to a federal grants review study section awarding research funds authorized under the Hill-Burton Act. The research was to benefit hospitals by providing guidance to improve hospital operations ranging from nurse-staffing models to scheduling and patient flow models. As reported by Charles Flagle, a member of this study section, HSR was seen as the field addressing operational problems in healthcare and specifically in hospitals.

In 1967, U.S. President Lyndon B. Johnson ordered the creation of the National Center for Health Services Research (NCHSR) in the federal Department of Health, Education, and Welfare (DHEW). The name was subsequently changed to the Bureau of Health Services Research and Evaluation and then to the National Center for Health Services Research and Development (NCHSR&D). In 1989, the U.S. Congress passed legislation replacing NCHSR&D with the Agency for Health Care Policy and Research (AHCPR). This elevated HSR to the same organizational level in the Department of Health and Human Services (HHS) as the National Institutes of Health (NIH).

One of the congressional mandates for the AHCPR was to undertake outcomes research to learn what services benefit whom and under what circumstances. Also, the new agency was to integrate knowledge from health services and clinical research and develop practice guidelines for providers and patients. The goal was to improve quality and reduce the costs associated with unnecessary use and ineffective services. In 1999, when the U.S. Congress reauthorized the AHCPR, its name was changed to the Agency for Healthcare Research and Quality (AHRQ). At the same time, the U.S. Congress removed the mandate for AHRQ to develop and disseminate practice guidelines and removed the word *policy* from its name. Controversy had surrounded the AHCPR's roles in health policy reform and in disseminating practice guidelines that defined preferred treatments. These changes modified the scope of its mission.

In seeking to understand which health services work best, for whom, and under what circumstances, the AHRQ is expected to provide information that ultimately affects the practice of medicine. In the Medicare Modernization Act of 2003, the U.S. Congress gave the mandate to AHRQ to undertake comparative-effectiveness research. The goal of comparative-effectiveness research is to provide information not currently available on which alternative treatments for specific health problems are best and for whom. The findings from comparative-effectiveness studies are expected to influence medical-care choices made by providers and by healthcare consumers, and may influence coverage choices made by payers and health plans. To the extent the comparative evidence leads to winners and losers in the medical marketplace, the interpretation and robustness of the HSR data will likely be challenged. Although this may be uncomfortable for the field at times, it will signify the maturity of HSR and its growing capacity to provide timely and relevant information that can improve the quality of healthcare.

HSR has provided the tools used by healthcare policymakers to modify payment methodologies (e.g., case-mix adjustment and pay-for-performance), measure performance (i.e., quality) of providers, and regulate the healthcare industry. Advances in measurement methodologies have made it possible to restructure and refine the

incentives inherent in payment, regulatory, and quality reporting methodologies. HSR is increasingly relied on to provide the methods and measurement tools needed to evaluate the efficiency and quality of care and to provide the knowledge needed by policymakers, providers, payers, and the general public to make better-informed health-care decisions.

Basic Concepts and Tools

HSR is a field of study that draws on the theories and methods of the social and behavioral sciences, economics, medicine, public health, engineering, and mathematical disciplines. As a result, the tools used in HSR are not unique to the field. What has emerged as unique, however, is their adaptation to the understanding of health services and patient outcomes. Three research themes have dominated the HSR field: (1) controlling rising healthcare costs and improving efficiency, (2) improving the quality of healthcare services to ensure the best outcomes for patients, and (3) improving access to healthcare for disadvantaged and uninsured populations. Health services outcomes are defined broadly and include mortality, morbidity, health-related quality of life, satisfaction, and healthcare costs.

Healthcare Costs

Rising and difficult to control, healthcare costs have been a persistent public policy issue since the passage of the Medicare and Medicaid programs in 1965. Health economists have contributed to the understanding of the complexity of forces driving healthcare costs, including the lack of cost competition among providers, the design of health insurance plans in a way that protects individuals from having to make economic choices (moral hazard), and failures to provide consumers with information on cost and quality trade-offs. The classic RAND Health Insurance Experiment (HIE) of the 1970s demonstrated that increasing the level of out-of-pocket payments (coinsurance and deductibles) for healthcare reduces the average use of health services and costs. An analysis of episodes of care by Keeler and Rolph showed that the level of out-of-pocket payments was a primary influence on the decision whether or not to seek healthcare.

Once the decision to seek healthcare was made, coinsurance and deductibles had little effect on the cost of the episode of treatment. One interpretation of this finding was that once the patient was receiving healthcare, the physician and not the patient largely determined the extent of utilization.

Recognition that incentives for efficiency needed to be present for both providers (supply side) and patients (demand side) led to policy innovations using HSR tools. When the Medicare program was started, it made cost-based payments to hospitals and usual, customary, and reasonable payments to physicians. As a result, healthcare costs rose rapidly as hospitals and physicians learned how to maximize their income. In 1983, Medicare implemented a prospective payment system (PPS), paying hospitals a prospectively set rate for each admission based on the discharge diagnosis and procedures. The classification system used in this payment system, diagnostically related groups (DRG), was a product of 1970s HSR. In that the DRG payment for inpatient episodes was independent of the patient's length of hospital stay, it provided strong financial incentives for shorter hospital stays. The payment system also created a financial incentive to increase the number of admissions (episodes), to fill the beds emptied due to reductions in the average length of patient stays. To avoid paying for unnecessary admissions, Medicare instituted reviews of hospital admissions to ensure appropriateness. The review of admissions applied criteria from the Appropriateness Evaluation Protocol (AEP), a product of HSR studies.

Health maintenance organizations (HMOs) date back to the Kaiser Permanente clinics for employees in the 1930s. In 1983, the U.S. Congress passed the HMO Act, which defined the HMO in federal law. HMOs receive a fixed capitation payment for each enrollee (per person, per year) instead of being paid on a fee-for-service basis. The incentives associated with capitation payment are, clearly, to live within a budget equaling the total enrollment times the capitation rate. To balance their budgets, some consumers challenged that HMOs were sacrificing quality of care to save costs. HSR in the 1970s and 1980s examined the quality of care of HMOs compared with the fee-for-service care provided in the same communities. The findings consistently showed that HMO quality of care was equal to or better than fee-for-service care.

In the 1990s, there was rapid growth of managed-care plans that used administrative processes to manage utilization during episodes of treatment to control the costs of care (e.g., prior authorization, utilization review, and limits on the number of services). These plans generally did not impose deductibles and charged modest copayments to avoid discouraging ambulatory care utilization. Overall, utilization controls were principally supply side, where it was perceived that the greatest impact could be achieved. Public reaction to health plans controlling utilization and limiting access to some specialists and/or tests and treatments was very negative. One result was that health plans began offering insurance plan options to enrollees that allowed them to retain greater choice by paying higher premiums. The public concerns also contributed to laws in many states that required timely appeal processes, using third parties, when services were denied.

Another concern was that HMOs and managed-care plans were responding to the capitation payment method by seeking to enroll healthier people and avoiding very sick people in the community. This was a result of having capitation rates based on age and not explicitly taking into account health characteristics. HSR investigators developed and validated methods for risk adjustment. Today, these methods are being applied to adjust capitation rates based on the health characteristics of enrolled populations, better matching the capitation rate to the healthcare needs of the enrollees.

Healthcare Quality

The accepted paradigm for examining the quality of healthcare is drawn from the seminal work of Avedis Donabedian. Quality of care is influenced by the structure of the healthcare system and its resources and by the processes of diagnosis, treatment, and management. These come together to influence the health outcomes experienced by patients. The measurement of quality of care involves the measurement of structural and process of care characteristics and their influence on patient outcomes. With advances in HSR and clinical research, knowledge is growing and clarifying the contribution of specific treatments (processes) to the likelihood of alternative health outcomes.

Provider licensure and facility accreditation is required by states and payers and, for a long time, was accepted by the public as sufficient to protect their quality of healthcare. Accrediting organizations for hospitals and health plans (e.g., the Joint Commission and the National Committee for Quality Assurance [NCQA]) require healthcare organizations to meet structural standards and conduct studies to measure care processes and patient outcomes. The findings from these studies are expected to feedback into the care processes to improve patient outcomes. Quality of care, however, became a prominent public policy issue during the late 1990s. One source of concern were decisions made by managed-care plans that specific tests or procedures ordered by the patient's physician were "not deemed medically necessary" and would not be covered by the managed-care insurer. Disagreements about medical necessity between physicians and managed-care plans put the patient in the difficult position of having to decide who to believe and tested the patient's willingness to pay out-of-pocket costs for the physician-ordered tests or treatments not covered by their plan. Other sources of concerns came from HSR studies showing that only half of the time did patients receive care meeting the quality standards for their chronic health problems. And other HSR studies reported high rates of medical errors in hospitals, contributing to morbidity and mortality. The mounting evidence of these problems turned the nation's attention to the great need for more research and policy initiatives to improve the quality of healthcare.

In *Medicare: A Strategy for Quality Assurance*, the IOM defined quality of care as "the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge" (p. 21). The emphasis is on providing care that can be expected to lead to the best outcomes. However, for many this is not sufficient: Instead, the care provided should increase the likelihood of the outcomes desired by the patient. And the patient's desired outcomes may differ from the usual medical treatment goals, which would be expected to be to reduce mortality and morbidity risks. Patients, however, may be willing to incur increased mortality and morbidity risks to improve quality of life outcomes (e.g., to be able to do those

activities valued by the patient). The relationship of treatment choice to trade-offs in outcomes may be most often discussed as a consideration for end-of-life care, when treatments that may extend life may also significantly diminish quality of life for the time that remains. In routine healthcare, treatments prescribed that interfere with a patient's ability to work or carry out other usual activities may be less desired.

Starting in 1999, the IOM produced a series of reports that informed the general public and policymakers that America's healthcare was facing serious quality problems. Tens of thousands of Americans were dying each year due to medical errors and the failure to provide consistent, high-quality care. In a 2001 report titled *Crossing the Quality Chasm: A New Health System for the 21st Century*, the IOM found that the American healthcare system was fundamentally flawed. Systems of care were largely dysfunctional; not meeting the growing needs of chronically ill populations; and failing to provide continuing, coordinated, and integrated healthcare. The report concluded that to create a functioning healthcare system, it would require a fundamental transformation of the current system. The report also stated six specific goals for quality of care for the future. Specifically, patients should receive care that is safe, effective, timely, patient centered, efficient, and equitable. And increasingly, the reporting of the quality of healthcare findings is organized into these six categories. The *National Healthcare Quality Report*, mandated by the U.S. Congress, uses this framework to compare quality of care over time and across populations and diagnoses.

Access to Care

The American healthcare system differs substantially from systems in other developed nations (e.g., Canada, Germany, and the United Kingdom) by failing to provide health insurance coverage to all its citizens. The public commitment to health insurance coverage is limited. The Medicare and Medicaid programs cover the elderly, the disabled, and many, but not all, of the poor. The Veterans Administration covers those who have served in the military, with priority given to service-connected disabilities. The number of uninsured

Americans has been growing and was estimated by the Kaiser Commission on Medicaid and the Uninsured to be approximately 46.4 million in 2006. The HSR field has systematically documented the adverse health effects of being uninsured. Lack of health insurance is associated with fewer preventive services and contributes to significant delays in the receipt of necessary acute and chronic care.

In its report *Access to Health Care in America*, the IOM has defined access to healthcare as being the “timely use of personal health services to produce the best outcome” (p. 33). As a reminder of HSR measurement challenges that persist, the measurement of *timeliness* is not well developed. Early efforts to measure timeliness in ambulatory care showed that patients and physicians frequently disagreed about the timeliness of the visit. Criteria by which to judge timeliness of care do not exist for most medical conditions. Few quality standards specifically assess timeliness of care and little is known about the timeliness of most healthcare.

Improving access to care has proved to be more complex than merely extending insurance coverage to all Americans, although this is a prerequisite for access. Other barriers to access exist, including the lack of local availability of healthcare services, delays in being able to obtain visits with local healthcare providers, and limited understanding among consumers about how to use healthcare services most appropriately. Early researchers examined healthcare-seeking behaviors to understand individual decision making. The concepts of perceived health risks, the expected benefits, and overcoming the barriers to the receipt of care were conceptualized and measured. It was recognized that the failure to receive timely care may be the result of complex interactions of patient decision making, insurance coverage, availability of appointments with providers, delays in receiving tests and results, and competing demands in the patient’s life. Today, it is widely acknowledged that consumers must be educated to be able to achieve the maximum benefits from the health services available. Also, many believe that to have a responsive American healthcare system, all citizens need to have adequate health insurance coverage. The means for achieving these goals are a current priority for HSR.

Disparities in Healthcare

Among the most vexing problems in American healthcare are the extensively documented disparities in the health services received by racial and ethnic minorities as compared with the majority population. One contributor is poorer access to care among minorities. However, disparities persist even after people have entered treatment. In a groundbreaking national report *Unequal Treatment: Confronting Racial and Ethnic Disparities in Healthcare*, the IOM found that significant disparities in treatment occurred in physician’s offices and resulted in the generally lower quality of care for racial and ethnic minorities. The report described the multiple dimensions of this problem, including the extent to which disparities are associated with cultural differences, language and communication differences, increased uncertainty about best treatment, or stereotypes and biases toward ethnic and racial minorities. The evidence is convincing that disparities exist and are harmful. The future challenge for HSR is to identify ways to intervene effectively to prevent disparities in quality of care from occurring. The goal is to strengthen the capacity of the nation’s healthcare system to provide equal quality care for all.

Future Implications

The definition of HSR and associated definitions of quality of care and access to care are shaped by our understanding of the contributions of health services to disease and the health outcomes of individuals and populations. As a result, these definitions can be expected to change as we learn more. In the future, the definition of HSR may more specifically address the importance of environmental factors and their effects on health and the need for services. Changes in technology may also lead to changes in the definition. For example, as new technology makes it possible for individuals to self-diagnose and the potential for self-management or treatment becomes greater, the distinction between patient and provider may blur. Even today, we recognize that successful chronic-disease management is highly reliant on the patient and the family to manage day-to-day care. Successful chronic-disease management requires patients to be able to identify and appropriately respond to

acute exacerbations. Although the defining characteristics of HSR may change in the future, the desired outcomes are likely to remain the same: protecting and improving individual and population health and well-being.

Donald M. Steinwachs

See also AcademyHealth; Agency for Healthcare Research and Quality (AHRQ); Health Economics; Health Services Research, Origins; Institute of Medicine (IOM); Medical Sociology; Public Health

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- Canadian Association for Health Services and Policy Research (CAHSPR): <http://www.cahspr.ca>
- Canadian Health Services Research Foundation (CHSRF): <http://www.chsrf.ca>
- Health Research and Educational Trust (HRET): <http://www.hret.org>
- Health Resources and Services Administration (HRSA): <http://www.hrsa.gov>
- National Academy of Sciences, Institute of Medicine (IOM): <http://www.iom.edu>
- National Information Center on Health Services Research and Health Care Technology (NICHSR): <http://www.nlm.nih.gov/hmd/nichsr/home.html>
- Robert Wood Johnson Foundation (RWJF): <http://www.rwjf.org>

HEALTH SERVICES RESEARCH, ORIGINS

Healthcare providers, public health officials, and others were examining access, cost, quality, and the outcomes of healthcare long before the term *health services research* (HSR) was coined. While many countries and cultures have been grappling with issues concerning the efficacy and efficiency of healthcare delivery and medical outcomes for centuries, the United States has a particularly rich history in this subject.

The field of HSR has codified diverse concepts and methods under a broad rubric within the past century. In contrast to the rapidly evolving arena of biomedical research, there was no defined field of scientific investigation that encompassed the many disciplines, methods, and problems being addressed. Instead, the field of HSR included the questions being asked about the disparate facilities, personnel, management, use, benefits, risks, costs, social and behavioral influences, and outcomes brought

to bear on the full spectrum of human health and disease. Early efforts to expand and formalize the study of HSR laid a strong foundation for the careful examination of the nation's healthcare system and the ongoing efforts to improve it.

The National Information Center on Health Services Research and Health Care Technology (NICHSR) has compiled a comprehensive history of the field, highlighting important milestones and events that helped define the area of study. This entry examines this history and the origins of HSR.

History

Early History

Many early achievements in the field of health services can be credited to England. In the 17th century, Sir William Petty (1623–1687), a physician and an economist, used quantitative reasoning when looking at physician practice and hospital care. William Farr (1807–1883) relied on statistical data on morbidity and mortality to evaluate the effectiveness of the healthcare system in the 19th century. Florence Nightingale (1820–1910), considered the founder of modern nursing, worked with Farr to develop uniform reporting procedures for British hospitals; she also was one of the first researchers to use graphics to explain and promote good hygiene practices.

The Industrial Revolution in the United States spurred the creation of many public health entities designed to promote hygiene, nutrition, and safety. These early agencies focused on assessing the health needs for many populations, as well as evaluating the success of health interventions; they relied on health services approaches to measure the outcomes of their programs. The U.S. Public Health Service (USPHS), which was established in 1798 to provide medical care to merchant seaman, expanded its role to partner with local public health departments in keeping military training bases free of disease during World War I. The American Public Health Association (APHA), which was established in 1872, examined the coordination of local public health departments in providing coverage to the whole country following the passage of the federal Social Security Act in 1935. The predecessors to the Association of American Medical Colleges (AAMC) and the

National Institutes of Health (NIH) were founded during this time, and the first issues of the *Journal of American Medicine* and the precursor of the *New England Journal of Medicine* also appeared in the 19th century.

Early 20th Century

Research on health services continued into the turn of the 20th century, with many studies addressing the role of health professionals and institutions and examining the impact of disease and disability in the United States. For example, Hull House and the Chicago Medical Society conducted a birth record study in 1908 to document the role of midwives during childbirth; the Flexner report, published in 1910, investigated the quality of 130 medical schools in North America and recommended the closure of 100 schools. Other efforts included the Report on National Vitality in 1909, surveys carried out by insurance companies, and several studies looking at social and health insurance.

The American Medical Association (AMA) surveyed the characteristics and the geographic distribution of hospitals in the nation in 1919. Ernest Codman (1869–1940) developed a system to monitor surgical outcomes; he was also a founding member of the American College of Surgeons (ACS) and its Hospital Standardization Program. The Committee on the Costs of Medical Care (CCMC) was created in 1927, and it conducted 27 different studies in the late 1920s and early 1930s before publishing its final report, *Medical Care for the American People*.

The Great Depression

The social and political conditions of the Great Depression, which started in 1929 and lasted until the beginning of World War II, prompted several policy changes and further examination of the insurance and healthcare systems. During this time, the Social Security Act was passed by the U.S. Congress; the Blue Cross and Blue Shield plans developed to insure patients for physician care and hospital care; and important studies—such as the National Health Survey and the Department of Labor, Division of Cost of Living surveys—examined health disparities, the impact of income on health status, and access to quality healthcare.

Laws passed as part of the New Deal increased the federal government's role in social programs and funding. However, private, charitable organizations still played an important role in advancing HSR. The Milbank Memorial Fund, the Commonwealth Fund, and the Kellogg Foundation all focused on improving healthcare in the country, and they helped fund the publication and dissemination of books and reports. In 1936, the Robert Wood Johnson Foundation (RWJF) was established; it would eventually become one of the largest healthcare foundations in the country. While these philanthropic entities provided essential support during the Great Depression, all of them continue with their expanded efforts today.

Federal Legislation

Following the findings of the special Committee on Medicine and the Changing Order, which was established by the New York Academy of Medicine and the American Hospital Association's Commission on Hospital Care, the U.S. Congress passed the Hospital Survey and Construction Act of 1946. Better known as the Hill-Burton Act, this federal legislation allowed for funding and conditions that expanded hospital construction throughout the country, especially in rural areas. The funding encouraged states to plan and build hospitals, which greatly increased the number of facilities and hospital beds. That same year, the U.S. Congress also passed the National Mental Health Act—which promoted research, training, and treatment centers in mental health—and the National Health Service Act, which organized local health centers to provide health services.

In 1949, the U.S. Congress recognized the need for research activities directed toward understanding and improving hospital facilities. In 1954, amendments to the Hill-Burton Act allowed for funding to support chronic-care facilities. One year later, policy was expanded to provide additional funds for research in hospital operation and administration in response to the identified need. Louis Block, a former hospital consultant, served as chief of the Research Grants Branch of the then U.S. Department of Health, Education, and Welfare (DHEW). In 1955, Block worked with John Cronin, chief of the Division of Hospital and

Medical Facilities, and U.S. Congressman John E. Fogarty to increase that year's Hill-Burton appropriation for what Block construed as medical-care research. These efforts resulted in a \$1.2 million increase in the available funds supporting research and initiatives in hospitals and other related health fields to gather information and develop new methods. They also advanced the field of HSR. Funding for this legislation ended in 1975.

Beyond the Hill-Burton legislation, the U.S. Congress passed several federal laws to expand public health and HSR. The Health Research Act of 1956 authorized increased funding for research into major diseases. In addition, the National Health Survey Act was also passed that year and provided for data collection, research, and statistical analysis on health needs, including special sickness and disability studies, by the USPHS.

The changing social climate in the United States, especially the Civil Rights movement, highlighted the issue of poverty for many Americans. The Civil Rights Act, the Economic Opportunity Act, the Comprehensive Health Planning and Services Act, and the passage of the Medicare and Medicaid programs allowed researchers to further examine issues of the medically underserved, access to services, advances in health technology, health economics, and the role of the healthcare professional. This expansion of federal policy set the stage for new laws and amendments to come in the 1970s and 1980s, much of it helping advance the role of HSR.

The Role of the National Institutes of Health

Because of the expansion of the Hill-Burton Act to include research, the NIH's Division of Research Grants (DRGs) was assigned the responsibility for reviewing new grant applications in 1955. Several NIH Study Sections existed at that time, including ones for Sanitation, Environmental Health, Public Health, and Public Health Methods. The Nursing Research Study Section was established to examine patient care. Shortly after this time, the NIH proposed the creation of the Hospital Facilities Research Study Section. These study sections were designated the Health Services Group.

After much internal debate as to the mission of the study sections and the gaps in research needs not being addressed by any one group, members of

the sections recommended expanding the role of the Hospital Facilities Research Study Section beyond the narrow scope of hospitals to include research on patient care and healthcare systems. In 1960, the NIH established the Health Services Research Study Section. It was primarily responsible for operational research in a community setting such as a health department; it was charged with the review of research grant applications in the area of community health, including needs, resources, planning, and practices of professionals, organizations, and institutions. The section was also responsible for reviewing applications for public welfare programs as they related to community health.

The Health Services Research Study Section, however, soon became focused on defining and developing its field, stimulating needed research, and improving research quality and credibility. Program development became just as important as reviewing grant applications. Kerr L. White, who gained a reputation as a health services researcher at the University of North Carolina, served as chairman of the study section from 1963 to 1965. One of his major initiatives at this time was to commission a set of articles that defined the scope, methods, standards, and applications of HSR. White organized a special symposium on medical care research in 1964. The *Milbank Memorial Fund Quarterly* published these articles in a special issue on HSR in 1967.

The leadership of the Health Services Research Study Section envisioned this new field as an amalgam of the perspectives of public health and clinical medicine, including methodology from economics, social survey research, epidemiology, biostatistics, and systems analysis. Another initiative of the group was to launch the new journal *Health Services Research*, first published in 1966. The first issue covered four topics: length of stay, statistical methods, health services utilization, and informatics. Other journals followed, such as *Medical Care Review* and *Social Science and Medicine*, offering health services researchers the opportunity to publish their studies and share their findings.

Other HSR Agencies

Although the inclusion of the Health Services Research Study Section at the NIH was key to

shaping and expanding the field, several other federal government agencies also had an important impact. The national Institute of Medicine (IOM) was established in 1970 to study policy issues that affect the health of Americans. Its work deals with quality of care, access to services, and healthcare financing and coverage systems.

The National Center for Health Services Research and Development (NCHSR&D), established by Executive Order in 1968, was created to support research, development, demonstrations, and related training directed to the improvement of the organization, staffing, delivery, and financing of health services, including the design and operation of health facilities. By 1974, that entity became the National Center for Health Services Research (NCHSR). The Veteran's Administration also started a Health Services Research and Development Office, and the U.S. Congress created the National Center for Health Statistics (NCHS) in 1974 to compile statistical information to guide policy to improve health. The Health Care Financing Administration (HCFA) was established in 1977 to oversee the Medicare and Medicaid programs; now known as the Centers for Medicare and Medicaid Services (CMS), this entity helped develop and establish the prospective payment system for Medicare recipients.

In the late 1980s, the U.S. Congress established the Agency for Health Care Policy and Research (AHCPR) from the National Center on Health Services Research (NCHSR). It was focused on patient outcomes and responsible for developing and sharing clinical practice guidelines, quality standards, medical review criteria, and performance measures. The AHCPR initiated Patient Outcomes Research Teams (PORTs), large multidisciplinary, multi-institutional projects that examined patient outcomes, treatment standards, and practice effectiveness for common chronic and acute conditions. Similarly, the AHCPR also sponsored the use of evidence-based clinical practice guidelines; through a partnership with the AMA, it set up the Web-based National Guideline Clearinghouse. In 2000, the U.S. Congress established the Agency for Healthcare Research and Quality (AHRQ) from the AHCPR.

Other federal agencies key to the promotion and growth of HSR include the Health Resources and Services Agency (HRSA), the Substance Abuse

and Mental Health Services Administration (SAMHSA), and the National Information Center on Health Services Research and Health Care Technology (NICHSR)

Private and professional organizations also play an important role in the ongoing efforts of HSR. Universities and private research centers—including the RAND Corporation, which conducted its seminal Health Insurance Experiment from 1974 to 1982—enable the field to make notable advances. The Joint Commission, a nonprofit organization originally founded in 1951, has expanded its mission to improve the safety and quality of care to the general public through rigorous accreditation of healthcare organizations and facilities. The International Society of Technology Assessment in Health Care (ISTAHC) was organized in 1985 to encourage research, education, cooperation, and the exchange of information. It became the Health Technology Assessment International (HTAi) in 2003.

The Association of Health Services Research (AHSR), founded in 1981, was a prominent group that strove to educate the public and politicians about the importance of HSR. Through a merger of the AHSR and the Alpha Center in 2000, the group is now known as AcademyHealth. Its mission is to promote interaction across the health research and policy arenas by gathering perspectives from many disciplines and professions and fostering working relationships between scientists, advocates, and policy makers. AcademyHealth partners with government offices, philanthropic foundations, and universities on a broad array of projects.

Future Implications

The middle of the 20th century proved to be a defining time for the field of HSR in the United States. Now, several subspecialties of the field have emerged, including clinical epidemiology, evaluative health sciences, evidenced-based medicine, health economics, health policy research, healthcare research, medical-care research, outcomes research, patient care research, and population health research. These areas are all concerned with improving access, cost, quality and the outcomes of healthcare.

Policymakers have taken an evidence-based approach to new legislation and regulations; they

rely on HSR to provide accurate data and strong recommendations for measures aimed at improving the nation's healthcare system. As this entry documents, the field made an impact on several social and health reforms in the past century. From helping control Medicaid costs to increasing access to care through the Medicaid and State Children's Health Insurance Programs (SCHIP), researchers have focused on assessing needs and evaluating programs. The field of HSR continues to evolve and expand to meet the changing needs of the nation.

Moving forward, health services researchers will be at the forefront of developing and implementing new healthcare reforms. As the nation continues to debate such issues as a national health insurance system, the escalating costs of healthcare, outreach efforts for chronic disease, and increased education for health promotion, its leaders will increasingly turn to the field of HSR for information and solutions.

Kathryn Langley

See also AcademyHealth; Anderson, Odin W.; Codman, Ernest Amory; Committee on the Costs of Medical Care (CCMC); Health Services Research, Definition; Public Health; Public Policy; White, Kerr L.

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- AcademyHealth: <http://www.academyhealth.org>
- Kerr White Health Care Collection, University of Virginia: <http://historical.hsl.virginia.edu/kerr/hsr.cfm>
- National Information Center for Health Services Research and Health Care Technology (NICHSR): <http://www.nlm.nih.gov/nichsr>

HEATH SERVICES RESEARCH AT THE VETERANS HEALTH ADMINISTRATION (VHA)

The Veterans Health Administration (VHA) is the federal government's lead agency serving the healthcare needs of the veterans of the U.S. military services, and the largest healthcare delivery system in the United States. The VHA is part of the U.S. Department of Veterans Affairs (VA), a cabinet-level department of the federal government. The VA is composed of the VHA, the Veterans Benefit Administration, and the Cemetery Administration. The Veterans Benefit Administration administers many programs, including the GI Bill, mortgages, and compensations and pensions, while the Cemetery Administration administers 1,000 cemeteries across the nation for veterans.

Overview of the VHA

The VHA's mission includes healthcare, education, backup for the U.S. Department of Defense, and research.

Healthcare

In fiscal year (FY) 2007, the VHA comprised 155 medical centers providing inpatient and

outpatient services. The VHA operates more than 1,400 sites of care, including 872 ambulatory-care and community-based outpatient clinics, 135 nursing homes, 45 residential rehabilitation treatment programs, 209 Veterans Centers, and 108 comprehensive home care programs. The total staff of the VHA was 182,946 full-time equivalents, including 11,343 physicians, more than 50,000 nurses, and other clinical and support staff. These professionals provided care for a total of 7.9 million enrolled veterans, including 567,852 receiving acute-care inpatient services and an additional 300,000 receiving inpatient psychiatric care, nursing home, or other types of inpatient care. Enrolled veterans generated a total of 60 million outpatient visits. The VHA's total annual budget for FY2006 exceeded \$31 billion.

Education

The educational role of the VHA was initiated in 1948 with the now famous "Memorandum 2" signed by Omar Bradley, the director of the Veterans Administration, the precursor of the VA. This memorandum directed the VHA to develop affiliations with the nation's medical schools and other health-affiliated schools to develop a constant source of physicians and other healthcare workers for the VHA's healthcare mission. The VHA is currently affiliated with 107 medical schools, 55 dental schools, and more than 1,200 other schools across the nation. Each year, about 90,000 health professionals are trained in VA medical centers. More than half of the physicians practicing in the nation receive some of their professional training in the VA healthcare system.

Backup to the U.S. Department of Defense

The VHA's medical system serves as a backup to the U.S. Department of Defense during national emergencies and as a federal support organization during major disasters.

Research

One of the major strengths of the VHA is that it is a healthcare delivery system as well as

a research-granting agency. In FY2006, the U.S. Congress appropriated \$412 million for the Office of Research and Development (ORD) of the VHA. Because research is one of the main missions of the VHA, each medical facility contributes the cost of their investigators' salaries and infrastructure support for these grants, thus greatly enhancing the amount allocated by Congress. In 2006, this was an additional \$357 million from the medical-care account. Non-VA sources, such as the National Institutes of Health (NIH), other government agencies, and pharmaceutical companies, provided an additional \$882 million in funding for VA research.

VA research focuses on areas of concern to veterans. It has earned an international reputation for excellence in areas such as aging, chronic disease, prosthetics, and mental health. Studies conducted within the VA help improve medical care not only for the veterans enrolled in the VA's healthcare system but also for the nation at large. Because 7 out of 10 VA researchers are also clinicians, the VA is uniquely positioned to translate research results into improved patient care. VA scientists and clinicians collaborate across many disciplines, resulting in a synergistic flow of inquiry, discovery, and innovation between the laboratory and clinical settings.

The ORD of the VHA is divided into four services: Basic Research Service; Clinical Research (including Cooperative Trials) Service; Rehabilitation Research and Development Service; and Health Services Research and Development Service. Each of these services solicits requests for proposals in their designated areas. And each service has several study sections to review grant proposals.

Health Services Research and Development Service

The Health Services Research and Development Service (HSR&D) was initiated in 1976 with a budget of \$3.6 million. In FY2007, its budget was \$68 million. An additional \$14 million was allocated to HSR&D by Patient Care Services to administer the Quality Enhancement Research Initiative (QUERI) program.

Mission

The mission of HSR&D is to advance knowledge and promote innovations that improve the health and care of veterans and the nation. Many of the studies conducted by this service have been used within and outside the VA to assess new technologies, explore strategies for improving health outcomes, and evaluate the cost-effectiveness of services and therapies. The need for high-quality health services research (HSR) continues to grow to keep pace with and respond to the rapid changes under way within the VHA and in the healthcare community as a whole. The HSR&D carries out this mission through its various programs, including peer-reviewed research, career development, and research and resource centers.

Health Services Research

HSR in the VA examines the organization, delivery, and financing of healthcare from the perspectives of patients, caregivers, providers, and managers to improve the quality and economy of care. Specifically, the HSR&D is interested in evaluation of the structure, processes, and outcomes of care, including issues of patient safety and equity. The HSR&D is also concerned with system-level outcomes such as assessments of cost and access, as well as effective ways to translate clinical knowledge into practice. The underlying objectives of HSR in the VA are to understand and improve clinical decision making and care, inform patients, evaluate changes in the healthcare system, and inform VA policymakers.

HSR&D's projects are often multidisciplinary activities. They involve expertise in a combination of clinical fields (medicine and all its specialties, nursing, and other healthcare professions), social sciences (especially psychology, sociology, economics, and organization theory), and multiple research approaches and methods (experimental and quasi-experimental studies, survey research, database analyses, biostatistics, psychometrics, econometrics, and modeling techniques).

HSR&D's Components

The HSR&D has six components: (1) investigator-initiated research (IIR), (2) service-directed research,

(3) career development for clinicians and nonclinicians, (4) research centers, (5) resource centers, and (6) QUERI.

Investigator-Initiated Research

The largest component of HSR&D's budget is allocated to the IIR program. The HSR&D Service has active solicitations in 11 priority areas: (1) access and rural health; (2) complex, chronic condition care; (3) equity and health disparities; (4) health services genomics; (5) health informatics; (6) implementation and management research; (7) long-term care and care giving; (8) mental health; (9) postdeployment health; (10) research methodology; and (11) women's health.

Research proposals in these areas may request up to 4 years of funding and up to \$900,000; however, projects that can produce useful findings, either intermediate or final, in a shorter time frame are encouraged. The research designs used in the research studies are expected to be appropriate and efficient, with all budget categories well justified. All proposals are reviewed by a scientific-merit review board made up of experts in the area from within and outside the VA. Proposals must receive a high priority score to be considered for funding.

Service-Directed Research

The emphasis in service-directed research is on applied, action-oriented research that uses established evidence to create and document real change within an organizational unit. Projects respond rapidly to organizational needs, favor active facilitation over passive observation, modify approaches in midstream through formative evaluations, and share resources from VHA operational entities. Service-directed projects adopt the implementation framework used by the VA's QUERI. Principal investigators are encouraged to integrate their work with the QUERI program and to address conditions of high priority to the VHA because of prevalence, burden, urgency, or special emphasis populations.

Project proposals are solicited through announcements to VA's QUERI Centers, HSR&D's Centers of Excellence, or announcements to all the VA. On approval of a concept paper, a full project pro-

posal is requested from the investigator. Proposals are peer reviewed by an expert panel of reviewers, and if approved, are considered for funding.

Career Development for Clinicians and Nonclinicians

The Career Development Program is intended to attract, develop, and retain talented researchers working in areas of particular importance to improving the health and care of veterans. The program is open to clinicians and nonclinicians. Specifically, it includes the career development award one (CDA-1), career development award two (CDA-2), career development transition award (CDTA), and career development enhancement award (CDEA).

The CDA-1 is an entry-level career development program open to both clinicians and nonclinicians. It emphasizes mentorship and career development planning with full salary support for up to 2 years.

The CDA-2 is a midlevel program open to both clinicians and nonclinicians who must outline a 3- to 5-year agenda of career development and research activities. It includes full salary support for 3 to 5 years.

The CDTA is only open to clinicians who have submitted a merit review proposal that has been approved. This award provides up to 3 years of transition funding to ensure that their research career is well established.

Last, the CDEA supports established clinical and nonclinical scientists by providing the opportunity for a research sabbatical of up to 6 months to learn new research skills. To be considered for this award, an individual must have been an independent investigator in the VA for a minimum of 6 years. During the award period, the individual must devote 100% of his or her time to research.

Research Centers

There are 13 HSR&D Centers of Excellence located throughout the nation. In addition, HSR&D's Research Enhancement Award Program (REAP) supports nine other research centers.

HSR&D provides core funding for its Centers of Excellence. Each center develops its own research agenda, is affiliated with a VA medical center, and collaborates with local schools of public health

and universities to carry out its mission. The research at each center serves to energize the facility and network with which they are affiliated and provides a constant source of innovation, creativity, and support. Centers of Excellence are competitively awarded and must compete for renewal every 5 years.

Current Centers of Excellence include the following: Center for Clinical Management Research, located in Ann Arbor, Michigan; Center for Health Quality, Outcomes and Economic Research (CHQOER) in Bedford, Massachusetts; Center for Organization, Leadership, and Management Research (COLMR) in Boston, Massachusetts; Center for Health Services Research in Primary Care in Durham, North Carolina; Center for Management of Complex Chronic Care in Hines, Illinois; Houston Center for Quality of Care and Utilization Studies (HCQCUS) in Houston, Texas; Center for Excellence on Implementing Evidence-Based Practice in Indianapolis, Indiana; Center for Research in the Implementation of Innovative Strategies and Practice (CRIISP) in Iowa City, Iowa; Center for Chronic Disease Outcomes Research (CCDOR) in Minneapolis, Minnesota; Center for Health Care Evaluation (CHCE) in Palo Alto, California; Center for Health Equity Research and Promotion (CHERP) in Pittsburgh and Philadelphia, Pennsylvania; Northwest Center for Outcomes Research in Older Adults in Seattle, Washington; and Center for the Study of Healthcare Provider Behavior in Sepulveda, California.

The HSR&D also provides core support for nine REAPs, located at VA medical centers and not affiliated with a Center of Excellence but which already have a history of HSR&D research and a minimum number of funded investigators. They are to develop a core program of investigators, statisticians, and other social scientists to support and facilitate the development of HSR&D research projects and the training and mentoring of new HSR&D investigators. REAP sites are smaller than Centers of Excellence but may compete to become a Center of Excellence when appropriate. REAP sites are competitively awarded and must compete for renewal every 5 years.

The current REAP sites include the following: Deep South Center on Effectiveness, located in Birmingham, Alabama; Colorado REAP to Improve Care Coordination for Veterans (CRICC) in Denver,

Colorado; Center for Healthcare Knowledge Management in East Orange, New Jersey; Rehabilitation Outcomes Research Center for Veterans with Neurological Impairment in Gainesville, Florida; Center for Mental Healthcare and Outcomes Research (CeMHOR) in Little Rock, Arkansas; Columbia Center for the Study of Chronic Comorbid Mental and Physical Disorders in Portland, Oregon; Veterans Evidence-Based Research Dissemination and Implementation Center in San Antonio, Texas; Program to Improve Care for Veterans with Complex Comorbid Conditions in San Francisco, California; and the VA Outcomes Group in White River Junction, Vermont.

Resource Centers

HSR&D provides core funding to three resource centers that support its management and investigators by providing data, consultation, and focused research on management issues, health economics, and informatics systems. The three centers are the Health Economics Resource Center (HERC), VA Information Resource Center (VIREC), and the Center for Information Dissemination and Education Resources (CIDER).

The HERC, located in Menlo Park, California, assists VA researchers in assessing the cost-effectiveness of medical care, evaluating the efficiency of VA programs, and providing and conducting high-quality economics research.

The VIREC, in Hines, Illinois, supports VA researchers using databases and information by creating a knowledge base of factual and evaluative information about the VA and select non-VA data. It disseminates information via a help desk, publications, a Web site, research user guides to select data sources, and a HSRData Listserv. The center also represents the interests of VA researchers using databases and information systems through formal and informal liaisons within the VA and with other healthcare agencies and organizations.

The CIDER, in Boston, Massachusetts, manages the HSR&D's national dissemination efforts. Specifically, the center manages the national HSR&D and QUERI Web sites. It coordinates HSR&D's cyber seminars, and it develops and contributes to HSR&D's research and development publications and other VA and non-VA publications and products.

Quality Enhancement Research Initiative

The HSR&D's QUERI is a multidisciplinary, data-driven, quality improvement program designed to ensure excellence in all places where the VHA provides healthcare services, including inpatient, outpatient, and long-term care settings. QUERI is designed to translate research discoveries and innovations into better patient care and systems improvements. It focuses on nine high-risk or highly prevalent diseases or conditions among veterans: chronic heart failure, diabetes, HIV/hepatitis, ischemic heart disease, mental health, polytrauma, spinal cord injury, stroke, and substance use disorders. QUERI aims to identify best practices, systematize their use, and provide the ongoing feedback necessary to maintain ongoing improvement.

Today and the Future

The VHA, through the active involvement and support of all its services, including HSR&D, leads the nation in healthcare quality indicators, such as the administration of beta-blockers to heart attack patients, breast and cervical cancer screening, immunizations, and diabetic care. It exceeds the national average in quality scores from the Joint Commission. It has set the benchmark in patient satisfaction for hospital services in the American Customer Satisfaction Index, an indicator developed by the University of Michigan Business School. And the VHA is widely recognized as an industry leader for patient safety. Other healthcare systems in the United States, as well as foreign nations, are studying the VHA's success and are trying to duplicate it.

John G. Demakis

See also Computers; Continuum of Care; Electronic Clinical Records; Multihospital Healthcare Systems; Quality Enhancement Research Initiative (QUERI) of the Veterans Health Administration (VHA); Quality of Healthcare; TRICARE, Military Health System; U.S. Department of Veterans Affairs (VA)

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Web Sites

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- Health Services Research and Development Service (HSR&D): <http://www.hsr.d.research.va.gov>
- U.S. Department of Veterans Affairs (DVA): <http://www.va.gov>
- U.S. Government Accountability Office (GAO): <http://www.gao.gov>

HEALTH SERVICES RESEARCH IN AUSTRALIA

Australian healthcare appears to operate effectively, compared with other countries. Australians live longer than their counterparts in New Zealand, Canada, the United Kingdom, and the United States. Healthcare in Australia accounts for close

to 10% of the nation's gross domestic product (GDP). While this percentage is lesser than for Canada, France, Germany, and the United States, it is higher than for the United Kingdom or New Zealand. Australia's healthcare system ensures universal coverage for medical services, hospital care, and pharmaceuticals.

Nonetheless, Australia faces challenges, with rapidly increasing health service costs, lack of coordinated care particularly for chronic and continuing health problems, failures in safety and quality, and poor health outcomes for some population groups, most particularly indigenous Australians. In the future, advances in medical technology, a growing proportion of elderly, and population health changes such as the rise in obesity may continue to stretch health service delivery and the nation's capacity to finance the growing demands on the healthcare sector. Health services research (HSR) helps assess these issues, develop interventions, and inform policy change.

Background

Australia has a federal system of government in which both the national government and the States and Territories hold responsibility for healthcare. In addition, the system is a complex set of interactions between the public and private sectors in both healthcare finance and delivery. Most Australians live in urban centers along the southeastern coastline. Service delivery to the rural populations has to contend with large distances, remote centers, extremes of climate, shortages of healthcare workers, limited access to specialist and referral services, as well as the social and economic problems of remote communities.

The importance of Australian HSR has been recognized by many national reviews of health and medical research funding, acknowledging that reforms in health funding, financing, and the delivery of healthcare require solutions that are tailored to the Australian culture, history, and organization. There are several areas in which Australian research has made significant contributions. Australia was the first country in the world to introduce the requirement that the cost-effectiveness of new drug therapies be considered explicitly before new pharmaceuticals are added to the subsidized list. The use

of health technology assessment approaches to proposals for new government funding, particularly public health programs, has been evident over a longer period. Australian researchers have made significant contributions to the development of case-mix classification. HSR has also been used to develop and assess new methods of funding, though this has not been applied consistently, and many new funding schemes have been established with little or no independent research. In the important area of health workforce, there has been little independent or investigator-initiated research, although government inquiries and planning agencies have generated substantial activity. There is continued interest in the development of research that will ensure a suitable evidence base for policy development.

In addition, the Health Services Research Association of Australia and New Zealand (HSRAANZ) holds its major scientific meeting every 2 years. This active group represents the significant history and promising advances in this field.

Pharmacoeconomics

The Pharmaceutical Benefits Scheme (PBS) provides universal access to prescription medicines outside public hospitals and funds around 90% of prescriptions. Patients are charged a set copayment. Pharmaceutical manufacturers apply for a product listing on the PBS for specified indications. The submission is required to provide evidence of the drug's safety, effectiveness, and, since 1993, cost-effectiveness according to detailed guidelines. The evidence is reviewed and may be reworked by an independent advisory committee assisted by a team of independent evaluators. This requirement has generated a great deal of interest and work in pharmacoeconomics, though much of it occurs in the private sector and under commercial, in-confidence provisions. As a result, relatively little of it appears in the public domain.

Pharmaceuticals currently account for around 15% of Australia's total healthcare spending, but this has been the fastest growing component of the health budget for several years. The rationale for this approach is delivering value for money in new drug treatments rather than a focus on cost savings. Drug costs have continued to rise since 1993 and various cost-saving strategies, such as encouraging the use of generic drugs, have been adopted.

Economic evaluations submitted to the Pharmaceutical Benefits Advisory Committee (PBAC) use consistent methods, and a schedule of standardized costs is provided as a part of the submission guidelines. Although the committee favors the use of patient-relevant final outcomes, such as quality-adjusted life years (QALYs), a wide range of outcome measures are used. Although international clinical trials are considered rigorous evidence of safety and effectiveness, economic evaluation of Australian service delivery patterns and costs is also required so as to be relevant to the nation's context. The committee has largely made decisions that are consistent with the incremental cost-effectiveness result. The rigor of the evidence, the extent of uncertainty inherent in the evidence, the severity of the condition being treated and the availability of alternative treatments, equity, and the financial impact all depend on the scheme, and government health service funding more broadly can be considered.

Health Technology Assessment

A similar approach to health technology assessment is applied more broadly than to pharmaceuticals. Medical services provided elsewhere than in public hospitals, either in private hospitals or outpatient settings, are funded by a government rebate plus variable patient copayments, according to a schedule of specified services known as the Medical Benefits Schedule (MBS). The MBS covers primary care, surgical procedures, anesthesiology, pathology, and radiology. Since 1998, to be included on the MBS and to be recommended for public funding, new technologies and procedures must have evidence of safety, clinical effectiveness, and cost-effectiveness. Applications may be made by the manufacturers of devices or equipment, by provider groups, or by any interested party and should conform to the submission guidelines. The evaluations are conducted by teams working under the guidance of a specialist panel established by the Medical Services Advisory Committee (MSAC). These may extend or revise the original submission, both to ensure an adequate comparator for the incremental analysis and to incorporate Australian costs and other contextual factors. At this stage, MSAC guidelines only require a full economic evaluation if the proposed service is

expensive or likely to be widely used and are less prescriptive than PBAC about the type of analysis performed. The analyses are published as a series of MSAC reports.

In addition to the scientific evidence on safety, clinical effectiveness, and cost-effectiveness, the MSAC can also take into consideration access and equity; the prevalence and burden of the disease; the availability of alternative treatments; and the financial impact on the MBS, the public and private healthcare sectors, and society as a whole. Over time, these analyses have become increasingly sophisticated.

Nonpharmaceutical health technology assessment, however, preceded the development of the MSAC. Policymakers often commission substantial evaluations of new procedures as part of the consideration of new funding proposals. Although these efforts were in part under the auspices of some national technology assessment committee, the methodological approach adopted was not standardized across projects. Similarly, major public health programs, such as breast, cervical, and bowel cancer screening, have generally been required to demonstrate feasibility through pilot programs, which are evaluated for acceptability, effectiveness, and costs.

Many investigator-initiated projects work to evaluate a range of healthcare interventions, including public health programs, new methods of service delivery, and new procedures and diagnostic technologies. These studies can be funded from multiple sources, with variable impact on healthcare policy and practice, and where the objective may be more about knowledge creation or development of methods rather than immediate policy impact.

Case-Mix Classification

Interest in case-mix classification emerged in the 1980s, primarily from academic involvement in the development of a measurement tool, which could explain variations in lengths of stay and costs. The initial work was based on the Diagnostic Related Groups (DRGs) system developed at Yale University, but concerns about the relevance of this coding to Australian clinical practice provided the impetus for the development of a specific Australian classification system. Features of the Australian approach are the adoption of a national strategy,

involving both the federal and state health authorities with the commitment of substantial funding and other support, under the guidance of a committee of clinical experts, which has comprised medical, nursing, and allied health professionals. This undertaking produced a revised classification known as the Australian National Diagnosis Related Groups (AN-DRGs). The AN-DRGs were reviewed yearly and updated through three versions, increasingly encompassing a wider range of clinical factors such as age, malignancy, complications, and comorbidities as indicators of severity. A complete review of the classification structure was undertaken, prompted by the change to the International Statistical Classification of Diseases and Related Health Problems, 10th Revision (ICD-10). The result was the development of an Australian clinical modification of ICD-10, the ICD-10-AM, which is now in its fifth edition, and the Australian Classification of Health Interventions. The DRG system was renamed the Australian Refined Diagnostic Related Groups (AR-DRGs, Version 4.0). The Australian case-mix classification has been adopted by many other countries, including New Zealand, Ireland, and Germany.

The development of the Australian disease and intervention classifications and AR-DRGs represents a great deal of clinical and health services research. The research was given great impetus by the adoption of case-mix funding of public hospitals in the state of Victoria in 1993 and, subsequently, followed by most of the other states. Ongoing developments are managed by the Federal Department of Health and Ageing. This involves a 2-year cycle of clinical input, HSR, and widespread consultation around revisions to the classification system, as well as the preparation of cost weights from morbidity and cost data supplied by all public and private Australian hospitals. In addition to providing an indicator of hospital efficiency, these data form a schedule of standard costs which are used in pharmacoeconomics, health technology assessments, and other evaluations.

Healthcare Workforce

The training of the healthcare workforce is primarily determined by the government provision of funding for training and education and by the regulatory requirements for safety and quality; their

employment is provided, or heavily subsidized, by the public purse. Australian governments—both the federal, as the major funder of healthcare delivery, and the states, as providers of public hospital services—have a long-standing interest in ensuring the adequacy of the future healthcare workforce. A national structure to undertake healthcare workforce planning has been in place since 1995, initially covering the medical workforce. These efforts have since been extended to nursing and allied health professions. Under the auspices of these various committees, a number of reviews and reports have been completed and published. Further work has been commissioned by various inquiries, also initiated by the government or parliament.

The workforce-planning approach relies on a projection of future demand—based on population growth, changes in age-sex composition, and current patterns of use—with adjustment for the extent to which the current workforce is meeting current demand, and the projections of supply—looking at current training and entry, as well as expected retirements. The success of this approach in ensuring an adequate workforce is far from assured; Australia, like many other countries, is facing severe shortages of trained nurses, physicians in primary care and some medical specialties, and allied health professions. The planning strategy does not take into account changes in productivity, alterations in work patterns, or shifts in workforce participation. For example, although the number of medical graduates has increased more rapidly than the population growth, physicians have been working shorter hours, thus resulting, effectively, in an undersupply.

Development of an adequate workforce is likely to involve increasing productivity, more flexible approaches to professional roles and the delineation of responsibilities, varied approaches to education and training, and reform of payment mechanisms. This view is not readily encompassed by traditional workforce planning methods nor by government-led planning mechanisms. However, there has been little research activity beyond the government-sponsored process.

Funding Reforms

Australia has, alongside universal public health insurance, a substantial private health insurance

sector. Private health insurance covers private treatment in hospitals, alongside universal coverage for free public hospital treatment. It also covers a range of ancillary services such as dental care, physiotherapy, and other allied health services that are not provided in the public system. Since 1996, the government has introduced a number of insurance incentives, including a 30% subsidy on health insurance premiums, which is not means tested. This strategy has resulted in the rapid growth of health insurance to cover around 45% of the population, an increase of 15%. Researchers investigating the effectiveness of several incentives have found that the results of reform on the private sector reduced the pressure on public hospitals, and to a lesser extent, improved the comparative efficiency of public and private facilities.

Prior to the private health insurance incentives, the major change in financing was the move from voluntary but government-subsidized private insurance to universal, tax-financed, insurance covering both hospital treatment and out-of-hospital medical services. The first, universal, public scheme was introduced in 1976 as Medibank, dismantled by a subsequent government then reestablished in 1984 as Medicare. The scheme's architecture was developed from the independent research of two university economists, John Deeble and Richard Scotton.

Notions of managed competition and the separation of purchasers, providers, and funders did not gain traction with Australian policymakers nor, for that matter, with health services researchers. The split in funding responsibilities across levels of government has long attracted critical comment, and not surprisingly, pooling these separate entitlements into a common budget seemed to offer an opportunity for improvement. This approach was tested through a series of demonstration projects known as the Coordinated Care Trials in the mid-1990s. Evaluation results were equivocal, both in terms of health outcomes and costs, with some trial programs facing national bankruptcy.

Data Sources

The Australian Institute of Health and Welfare (AIHW) is the national agency for health and welfare statistics and information. It is a statutory authority responsible to the federal

government, and it works closely with state and territory health agencies. Although it does not directly collect health data, it serves as a repository, playing a major role in ensuring standard definitions and consistent approaches and in making data readily available. National data standards have been developed by the AIHW in conjunction with all government health agencies and the Australian Bureau of Statistics. A comprehensive electronic repository of national data standards, known as METeOR, is accessible through the AIHW Web site.

The Australian Bureau of Statistics is responsible for a number of regular as well as occasional population surveys. There are also many administrative databases, including data on the Medicare services and the operation of private health insurance funds. Data sets are also kept by other agencies for specific purposes such as for medical audits. However, access to such data is often at the discretion of the data custodians, and the protocols for release of data vary widely.

Australia has been slow to develop ongoing population panels—in which a representative population sample is followed over time—but a few have been initiated in recent years and are starting to provide data. There is also increasing interest in the ability to link individuals across data sets. Arrangements in Western Australia have allowed data linkage for many years and have demonstrated the role of this linkage in supporting high-quality HSR.

Research and Policy Links

As evidence-based medicine has become influential in clinical decision making, so there have been calls for an evidence base for policy. The health services development program was established in the 1970s to develop further reforms following the introduction of national, public, health insurance. Alongside a major HSR program, it was established but was subsequently allowed to decline. Although other developed countries have invested in building such programs over the past 20 years, Australia has failed to make such investments.

Public health departments and other agencies regularly commission research: generally through a competitive tendering process, with very specific outputs required and often within short time frames.

The major, national, health research funding agency, the National Health and Medical Research Council (NHMRC), has attempted to develop ways of encouraging research in areas identified as priority health problems that would meet rigorous research standards and policymakers' needs. Many of these efforts have met with limited success as funds have been spread thinly and research priorities have been developed with little consideration given to research feasibility. Overall, researchers have been subject to many short-lived funding programs.

More recently, the NHMRC has established a Health Services Research Funding Program that provides more substantial and longer-term funding. Development of this initiative was strongly influenced by policymakers. Initially, this program identified the priority topic of healthcare financing, then priority approaches or disciplines such as the social sciences. Subsequently, it became less clearly targeted.

Future Implications

The future, though less clear at the moment, is promising. The Australian NHMR is now committed to implementing many of the recommendations of the most recent review of research funding and has been given substantial additional funding to support these efforts. The new strategy should encompass additional funding for IIR; new approaches to developing interactions between policymakers and researchers in defining priority topics; and the development of centers of excellence that ensure innovation in methodological approaches, continued development of skilled researchers, critical mass, and research infrastructure.

Jane P. Hall

See also Comparing Health Systems; Health Economics; International Health Systems; National Health Insurance; Pharmacoeconomics; Public Policy; Rural Health; Technology Assessment

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HEALTH SERVICES RESEARCH IN CANADA

Health services researchers and policymakers in the United States and Canada often contrast and

compare the two nation's healthcare systems. In the United States, those advocating a national health insurance system point to Canada as evidence that such a system works better than our own. In Canada, there is much discussion about the future of its healthcare system, and the U.S. system is often cited either in support of or as evidence against the privatization of care. This entry presents a brief overview of Canada's national health insurance system, and it discusses the structure and activities of health services research in Canada.

Canada's Healthcare System

Canada's national health insurance system has evolved over the past six decades. Saskatchewan was the first province to establish universal, public hospital insurance in 1947. By 1961, all the country's provinces and territories had established public insurance plans that provided universal access without user fees for hospital services. By 1972, the plans were extended to include physician services. Over the years, various laws were passed, including the Canada Health Act in 1985.

The most basic objective of Canada's healthcare system has been to provide universal coverage for necessary medical care to all Canadians, without imposing financial barriers such as out-of-pocket expenses, deductibles, or administrative costs. Canada's provinces and territories provide 13 interlocking, publicly funded health systems that meet the common criteria of Canada's Health Act. The first criterion is that of public administration. This establishes a single-payer insurance system administered by each provincial or territorial Ministry of Health for all services covered under the act. The second criterion is universality, requiring that all Canadian residents be eligible for insured health services. The third is accessibility, which ensures that there are no financial barriers, such as user fees. The fourth is portability, which allows health coverage for hospital and physician services for Canadian residents who are traveling in other provinces or countries. Finally, comprehensiveness refers to coverage for all hospital and physician services.

Seventy-one percent of the total funding for Canada's healthcare system comes from taxation. The federal government imposes the principles of

the Canada Health Act through fiscal transfers to the provinces. Portions of these tax-based transfer payments may be withheld, or financial penalties imposed, if any of the criteria in Canada's Health Act are violated. Provided they meet the criteria, provincial and territorial governments have exclusive powers over virtually all aspects of health delivery and organization, including, for example, control of hospitals, establishment of quarantine, organization of health services, regulation of the practice of medicine, formation of health professionals, creation of health insurance programs, regulation of the production and marketing of nutritional products, adoption of health and safety standards with respect to work and companies under provincial/territorial jurisdiction, and the system of indemnities for work-related injuries.

A Focus on Population Health

Since 1974, when the Lalonde Report—a new perspective for improving the health of Canadians—was presented in the House of Commons, Canadian health planners have adopted a broad, population-based view of health and illness, which emphasizes the social determinants of health. An important impetus for this perspective came from the realization that significant socioeconomic gradients in health status persisted even after the development of universal access to medical care. Further improvements in the health of Canadians would require a perspective that went beyond the healthcare system to the prevention of environmental and behavioral risks and the promotion of health. It gave rise to the “health field concept,” which considered health determinants from four perspectives: (1) human biology, (2) environment, (3) lifestyle, and (4) healthcare organizations. This framework gave impetus to national and international initiatives in health promotion and health protection.

In 1990, two Canadian researchers, Robert Evans and Greg Stoddart, published a highly influential article that placed emphasis on the determinants of health and illness, including the social environment. The healthcare system was identified as one component in a network of interrelated factors affecting population health. By the mid-1990s, federal, provincial, and territorial Ministers of Health had all endorsed a population approach to healthcare. A decade later, a survey of senior

federal and provincial civil servants revealed that virtually all (94%) were quite familiar with population-based determinants of health. Population health ideas have similarly percolated through policy and planning documents at the level of local health delivery systems.

Decentralization and Regionalization of Healthcare Delivery

Perhaps the most revolutionary change to occur in the Canadian healthcare system since its inception has been the move to population-focused regional systems of care. Currently, there are 108 geographically defined health regions across Canada. The boundaries and specific responsibilities of regions have been established by their respective provincial Ministries of Health. Each health region is administratively responsible to its respective provincial or territorial government for the provision of defined, publicly funded health services to residents of their respective geographic area. In recognition that the needs and demands of regional populations will differ, health regions typically have the responsibility to assess, prioritize, plan, and offer the suite of services that best meets the health needs of their respective populations.

Primary Care and Health System Renewal

Between 1975 and 1991, healthcare spending in Canada grew at an average annual rate of 3.8%. In September 2000, after a decade of fiscal restraint, deep cost cutting, and considerable loss of public confidence, the Ministers of Health of Canada's provinces agreed on an action plan for health system renewal. They agreed that primary care should be the cornerstone for health system renewal. Primary healthcare builds on the broad principles underlying the population health approach. Foremost, it is an approach to health, rather than healthcare, that goes beyond the provision of treatment-oriented services to include the full spectrum of prevention and health promotion. Primary-healthcare services will be the first point of contact with the health system. A key feature will be a shift away from general practitioners, who have typically worked in solo practices, to multidisciplinary teams of providers who are to be held accountable for providing services to a defined client population.

Primary-healthcare teams are to include prevention and treatment services, basic emergency care, referrals to specialists, and coordination of care that may be required at other levels in the health system (such as hospital, palliative, or rehabilitation services). As well as improvements in the management of health and illness, primary-healthcare teams are to build capacity to undertake evaluations, so that system performance may be monitored. Information technology, such as electronic clinical records, will play an important role in supporting the development of a culture of accountability and performance measurement.

Health Information

In Canada, the provision of population-based statistical information is a responsibility of the federal government. Statistics Canada is the federal agency responsible for this function. Statistics Canada collects data on Canada's population, its economy, society, culture, and health through population censuses, cross-sectional surveys, and longitudinal (panel) data. Microdata files are made available to researchers through university-linked research data centers, which are located throughout the country. The centers are staffed by Statistics Canada employees and operated under Canada's Statistics Act.

The Canadian Institute for Health Information (CIHI) is an independent, not-for-profit organization that captures health system information from hospitals, regional health authorities, medical practitioners, and government (through billing information). The institute publishes analytical documents and special studies on a wide range of topics, including healthcare services, healthcare spending, human resources, and population health. It also develops and promotes health indicators (such as life expectancy and per capita health spending) to compare health status and health system performance across provincial and territorial health systems and regional health authorities. Microdata are made available to researchers under strict privacy and data protection policies.

Health Services Research in Canada

In Canada, academic researchers occupy salaried positions in universities (paid from university

operating budgets), where they compete in national and other peer-reviewed funding competitions for the funds required for conducting their research. Competition for operating funds is stiff. In a 2007 open grants competition from the Canadian Institutes of Health Research (CIHR), for example, more than 2,000 operating grant applications were received, and less than 1 in 5 were funded.

Significant health system reform, including an increased emphasis on evidence-based care, health system accountability, and performance measurement, created a demand for health services research that quickly outstripped Canada's research capacity. New funding structures were required to support the clinical, population, and health services research needed to support health system restructuring and reform.

In 1996, the federal budget announced funding to establish what would become the Canadian Health Services Research Foundation (CHSRF) to facilitate evidence-based decision making in health. From the beginning, the foundation identified managers and decision makers as the primary audiences for its work and adopted an overall strategy that promoted linkage and exchange between research and decision maker communities, including incorporating decision makers (making up 50% of each committee) into the review process for operating grants. Since 2000, the foundation has de-emphasized open grants competitions (transferring this portion of their budget to be administered by another federal research funding agency) so as to consolidate its activities around capacity development and knowledge transfer.

In further recognition of the need for a broadened health research mandate in Canada, a new federal health research agency was created: the CIHR. This new structure includes 13 theme-based institutes, including an institute devoted to health services and policy research. The CIHR replaced the Medical Research Council as Canada's main health-research-funding agency. In addition to incorporating the biomedical mandate of the Medical Research Council, the CIHR was given a broadened mandate to foster clinical research, health system and services research, and population health research. By incorporating these four pillars of research under a single umbrella funder, the goal was not only to increase research in each of these areas but also to foster cross-pillar research

within and across institutes and to promote a multidiscipline approach. Under this new structure, funding for health services research grew 20-fold between 1999 and 2005. Typically, 30% of funding is reserved for strategic initiatives organized through the institutes, and the remaining 70% is reserved for open grants competitions. Currently, the CIHR funds more than 10,000 academic researchers and trainees across Canada with expenditures that total more than \$800 million.

Finally, in 2000, to build research capacity, the Canadian government created a national program to provide salary and infrastructure support to universities to attract and retain researchers—the Canada Research Chairs Program. Under the program, researchers receive salaried positions from the government in contrast to regularly awarded operating grants in which researchers do not receive salary support. Universities are each allocated a number of Chair positions and nominate researchers whose work complements their respective strategic plans. Some \$300 million per year is spent on all Chair positions with 26 Health Services Research Chairs having been funded to date.

With stable sources of salary funding, and increased spending on operating grants, the field of health services research in Canada has begun to blossom, evidenced by the development of the Canadian Association of Health Services and Policy Research (CAHSPR); a peer-reviewed academic journal entirely devoted to the topic, *Healthcare Policy* (launched in 2005); and 13 university-based centers across the country devoted to health services and policy research.

However, despite a growing and vibrant field, the 13 university-based health policy research centers in Canada face a number of important challenges, which attest to their still precarious position. The most important of these is how to maintain stable core funding for infrastructure. Most are funded through their respective provincial ministries of health, making funding unpredictable and subject to periodic renegotiation. For more than a decade, Canadian universities have operated under serious funding shortages, making them an unlikely source of stable funding for these centers. A second challenge is to maintain a balance between research that is of interest to Ministry funders (which may not translate into an academic product) and research that results in suitable academic publications.

Although the culture is beginning to change, Canadian universities still diminish the worth of applied research that does not result in academic publications. Certainly there is mounting pressure on university academics to produce research that is relevant and timely. While there is still a long way to go, universities are beginning to respond by recognizing the academic role of applied research and the importance of building capacity in this field so that it can be used in policy making.

Cross-National Health Services Research

In the context of health reform, much has been written about the Canadian versus the American healthcare system. While not all of it has been flattering or even correct, the ensuing debates have fostered considerable cross-national research examining patterns of healthcare utilization and health system outcomes. Despite widely divergent paths to healthcare delivery and reform in Canada and the United States, Canadians regularly monitor U.S. policies and practices and have imported American policy innovations and system strategies. The CIHR offers several funding programs to support international collaborations involving Canadian researchers and has supported strategic initiatives with U.S. granting bodies.

Future Implications

Health services research continues to place an emphasis on partnerships between researchers and policymakers in an effort to address key healthcare issues in Canada. The CHSRF has identified the following research themes for the coming years: workforce and the work environment; quality and patient safety; value-based decision making and public engagement; change management for improved practice and improved health; nursing leadership, organization, and policy; and primary healthcare.

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See also Access to Healthcare; Administrative Costs; ; Canadian Association for Health Services and Policy Research (CAHSPR); Canadian Health Services Research Foundation (CHSRF); Canadian Institute of Health Services and Policy Research (IHSPR); International Health Systems; National Health Insurance

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- Canadian Institute for Health Information (CIHI): <http://secure.cihi.ca/cihiweb/splash.html>
- Canadian Institutes of Health Research (CIHR): <http://www.cihr-irsc.gc.ca>
- Health Canada: <http://www.hc-sc.gc.ca>
- Statistics Canada: <http://www.statcan.ca>

HEALTH SERVICES RESEARCH IN DENTISTRY AND ORAL HEALTH

Research on oral health and related issues and conditions differs from research in dentistry, which may include clinical interventions and outcomes. The two domains share numerous common characteristics and overlap in some subject areas, but they also represent distinct and different points of reference in research.

The oral health domain includes the dimensions of eating, taste, drinking, speech, personal self-image, appearance, social interaction, employment and employability, attitudes and knowledge regarding oral health, effects across the age span, disease prevention and risk factor analysis, and studies of the oral health status of populations, among many others. In contrast, research in dentistry includes all aspects of clinical care and evidence-based assessments of its outcomes, instrumentation, methods, materials, patient management and satisfaction, diseases, immune disorders, and injuries, to name a few.

This entry begins by discussing recent research topics relating to oral health, dentistry and the overlap between the two. Next, this entry addresses health services research specifically and the various factors that affect such research. Finally, this entry touches on the future directions of health services research for dentistry and oral health.

Recent Research Topics

Recent studies have shown associations between chronic oral infections and heart and lung diseases, stroke, and low-birth-weight and premature babies. Additionally, several associations have been found between chronic and severe periodontal (gum) disease and diabetes. Injury and oral wound healing are also significant research topics. Wound healing in the oral cavity (the mouth) is accomplished in a unique environment of moisture, temperature, and bacteria. Injury can occur in various sports and through falls, motor vehicle collisions, and violence. Devices to protect against oral injury are also subjects for further investigation.

Research that cuts across these two domains and shares common facets include the following:

the impact of professionally applied fluorides, in addition to fluoride rinses, varnishes and gels, and community water fluoridation; financing of dental care; unmet needs in dental care; health literacy; and workforce studies. Behaviors and habits that affect oral health, including smoking and other tobacco uses, and dietary practices, are also important subjects for researchers. Dental care and service utilization; health disparities; issues specific to women's oral health, such as osteoporosis; and oral health concerns of people with disabilities are active areas of research.

Research in oral health also focuses on microbial elements, anatomical systems and their function, tissue and nerve systems, and cellular and molecular genetics. Many bacterial, viral, and fungal entities contribute directly to the onset of a variety of dental diseases. Understanding the effects of these agents is critical to disease prevention and health protection. Examples of research regarding anatomical systems include chewing and swallowing, and muscle and joint functioning. Other research areas include tissue and nerve systems; the structures and fluids of the oral cavity, such as teeth, saliva, mucosa, bone, and the tongue; as well as tissue regeneration and engineering. Current research shows promise that new teeth and new bone can be "grown" for replacement of missing or damaged segments of the jawbone (mandible). Research involving nerves and nerve signaling also includes studies regarding pain, its derivation and modulation, and the response to and coping with pain.

Saliva and, to some extent, tissue cells from the inside of the cheek (buccal mucosa) are increasingly being studied due to their potential diagnostic value. Saliva, as a serum exudate of blood, has been shown to be an effective diagnostic aid for a wide range of systemic health conditions, including human immunodeficiency virus (HIV) and hepatitis A and B, as well as for various drugs and environmental toxins. The use of saliva as a source for host DNA has facilitated detection of a wide range of viral and bacterial infections whose presence is difficult to detect. This has become an important area of ongoing research because obtaining saliva samples is relatively simple, noninvasive, and inexpensive.

Comprehending the genetic code for bacteria and other microbial entities that cause oral diseases, such as cavities in the teeth or gum

(periodontal) disease, is fundamental to the ability to protect against these conditions. These oral flora also form colonies on oral structures, resulting in the development of biofilms. The composition, mechanisms of actions, and adhesion capacity of these biofilms are important areas of research because of their importance in oral health and their broad application to other aspects of health beyond the oral cavity.

Health Services Research

Health services research entails multidisciplinary approaches that may include economics, political science, and medical sociology, to identify the most effective ways to deliver health services, document quality, reduce medical errors, and improve patient safety. Identifying effective ways to organize and manage health services, analyzing healthcare financing and costs, determining methods to improve access to and utilization of care, and ultimately improving the outcomes of care are among the inquiry domains of health services research.

Biological, behavioral, and psychological facets of health services research provide important views to better understand health needs and utilization of services, as well as the health disparities experienced by various populations. In effect, the evidence base derived from studies focused in these directions should serve to inform public policy on health issues and improve the systems of health services.

Health services research in dentistry has made significant contributions to the scientific literature despite the many difficulties encountered in conducting this type of research. At the same time, health services research in the field of dentistry is still in its developmental stages. Societal issues that affect oral health and, conversely, oral health conditions that affect societal issues, have received sparse attention.

However, it is in these areas that dental researchers are most challenged in their attempts to advance health services research. Large-scale population studies are expensive and time-consuming. Studies that require direct observation must include dentists, support staff, and appropriate clinical facilities. People, as study subjects, must be scheduled for examination and assessment. Finally,

dental records must be reviewed and summarized and pertinent data recorded. The latter step usually entails data coding of some sort. Consequently, large-scale population studies of this type are possible only when federal agencies undertake the study as a unique investigation or combined within a larger study.

Large-scale population opinion and information surveys have been employed effectively to conduct health services research regarding oral health issues. Surveys are somewhat less expensive than research based on direct observation. They can be conducted in person, by telephone, via mail, and through the Internet. Through surveys, issues such as patient satisfaction, access to care, and experiences in healthcare settings can be assessed.

Secondary Data Sets

The government, using various health-related population surveys conducted by federal agencies, and health insurance plans are also sources of data. These secondary data sets provide reliable information to facilitate health services research. For example, the federal National Center for Health Statistics (NCHS) conducts the National Health and Nutrition Examination Survey (NHANES) and the National Health Interview Survey (NHIS). Such surveys have been conducted periodically on a national sample and contain oral health status; dental-care-related observations; and questions regarding utilization of services, access to care, cost of care, patient satisfaction, and perceptions of quality of care received. When these types of surveys include direct clinical observations, it becomes possible to conduct research that validates patients' perceptions regarding quality of care.

Other sources of federal data with useful applications for health services research in dentistry include the Centers for Medicare and Medicaid Services (CMS), the Health Resources and Services Administration (HRSA), the Agency for Healthcare Research and Quality, and the Bureau of Labor Statistics (BLS). Other sources of data include the Health Plan Employer Data and Information Set (HEDIS), the Employee Benefit Research Institute (EBRI), and the National Association of Dental Plans (NADP).

Medicaid Data

Medicaid data from states that cover dental care are also available for analysis. Medicaid covers approximately 40 million people in the nation, mainly children and single mothers. However, there are limitations to the utility of these sources of secondary data. Not all states cover dental care under their Medicaid programs. A few states cover services for adults, and the types and range of services vary substantially among those states. Over three decades ago, federal legislation established a guarantee of dental care to Medicaid-eligible children through the Early Periodic Screening, Diagnostic, and Treatment (EPSDT) benefit. Even so, state Medicaid authorities have shown that fewer than 20% of the practicing dentists surveyed provided care that was paid for through their state program. Other analyses have shown that only about 20% of EPSDT-covered children receive dental care in a given year. Furthermore, as states elect to purchase dental care for Medicaid eligible individuals through managed-care organizations, rather than pay providers directly, additional barriers to accessing Medicaid service data from these intermediary sources have developed.

Dental Insurance Data

There are approximately 140 million people in the nation who have dental-care benefits through their place of employment or who purchase dental coverage separately from a variety of dental-insurance plans. Dental-insurance carriers include major national commercial plans, regional and state-specific companies, as well as carriers organized as Delta Dental Plans and Blue Cross Blue Shield Plans. Within this spectrum of plans, there is substantial variation in the manner in which dentists are structured to provide care. These variations include managed-care options such as preferred provider organizations (PPOs) and dental health maintenance organizations (DHMOs), indemnity plans, discount plans, and reduced-fee plans, among others. However, data indicated only a 50% to 70% annual utilization rate for persons with these forms of dental-insurance benefits. For the approximately 50% of Americans

who have no form of dental-insurance coverage, there are no reliable data sources pertinent to their utilization of dental care.

While select data can be obtained from dental-insurance carriers, the data may be limited due to the proprietary nature of the insurer's business interests, among other reasons. Furthermore, such data may have been collected and organized in such a manner that it may not be comparable with data sets from other private-insurance entities. In any case, since private health insurance is available for only a segment of the population, data from such sources cannot be generalized to the entire population.

Data From Public Health Departments

Oral health services may be provided within state and local public health departments; however, such services typically relate to disease prevention, health promotion, and health protection. In some instances, care for needy and underserved populations is also provided. In addition, population surveys are part of the public health function of these organizations. However, such surveys are conducted infrequently, are undertaken in the context of specific interests within a particular public health jurisdiction, and may not be conducted in a manner that allows for generalization to the entire population. Consequently, these surveys generally have marginal value for health services research.

Data on Dentists

The American Dental Association (ADA) conducts periodic and special surveys of dentists. These surveys tend to relate to various aspects of dental practice and experience, finance, and practice trends. The American Dental Education Association (ADEA) conducts surveys of dental schools and students pertinent to the process and outcomes of training and education of dentists.

Within dental practice settings, there are unique challenges in accumulating data necessary and sufficient for purposes of health services research. There are nearly 160,000 actively practicing dentists in the United States. The vast majority, more

than 90%, are in private practice. Of those dentists in private practice, 80% are general practitioners. The other 20% are specialists in one or more of the nine formally recognized dental specialty disciplines (orthodontics, oral and maxillofacial surgery, oral and maxillofacial radiology, periodontics, pediatric dentistry, endodontics, prosthodontics, dental public health, and oral and maxillofacial pathology). In medical practice, many physicians tend to practice in groups and congregate their practices and services in hospital practice settings. However, nearly 70% of dentists practice solo, another 20% practice with one partner, and the remainder (about 10%) practice in groups of three or more.

Dental Clinical Records

Within dental practice, there is no single, or even dominant, standard office protocol or format for data collection. There have been efforts to develop agreed-on data sets applicable to all patient services based on a common record format. However, there has been limited success in this regard. As noted previously, there are numerous dental health insurance plans. Among the plans, there is wide variation in claim formats, forms, data requirements, and information configurations. There are 56 dental schools in the United States; however, they use and teach different formats and methods for obtaining patient clinical records, history taking, and general aspects of data collection. Consequently, there are few persuasive external influences to achieve more uniformity in record keeping and data collection in dental practice.

Fees and payment for dental services, whether private and out of pocket or paid by some form of dental insurance, are based on procedures rather than diagnoses. Diagnostic codes are being developed and are used increasingly in dental practices; however, they are not the current norm. Data sets centered on diagnoses, and dental services provided in the context of those diagnoses, would be a valuable addition to the capacity of health services research in dentistry. The standards and criteria for diagnoses in dentistry can be readily defined and confirmed. The treatment response consistent with the diagnosis can vary based on many considerations. Consequently, health services research in

dentistry suffers from a lack of standardized starting points, such as diagnoses, and must rely essentially on service data independent of diagnosis. It also follows that outcome data are difficult to assess from a health services research perspective when there is no clear indication of the diagnostic starting point and the association between services rendered and disease conditions is unclear.

Further challenges are encountered in the relative lack of electronic clinical records in dental practice. While electronic clinical records are becoming more common, they are not ubiquitous among dental practices. Abstracting and summarizing data from paper records is time-consuming and expensive.

The Role of the Health Information Portability and Accountability Act

The Health Information Portability and Accountability Act (HIPAA) is an important hurdle to health services research in dentistry. This federal legislation was enacted in 1996 and obligates researchers to obtain specific permission from patients prior to accessing any patient-related information. This restriction applies to hospitals, medical and dental offices, clinics, and any other sources of healthcare service. As an example, this requirement presents a challenge in attempts to link data sets such as insurance claims and census data, where a patient's name or some other specific identifier is needed to link the data sets. However, once that is accomplished, the data can be structured in a manner that ensures that no individual patient can be identified by means of the resultant information.

Patient Care Options

Dental care is also affected by a relatively high degree of individual patient and provider options and preferences within a range of possible treatment approaches for particular situations. For example, there are choices among types of restorative materials (amalgam, gold, porcelain, resin) as well as options among the types of restorative procedures. This variation among treatment options and procedures adds to the complexity

of determining the outcomes, among other aspects, of health services research in dentistry. Differences in service patterns may be functions of provider preferences, patient preferences, cost considerations, true differences in patient health status, or cultural differences among population groups.

Obtaining Agreements to Conduct Research

The solo and independent nature of private dental practice also poses challenges to health services research regarding obtaining agreements from dentists to participate in research. For the most part, dentists are not engaged in research of this nature, nor were they trained in health services research while in dental school. Substantial effort is required to obtain the participation of private dentists in research projects. The significance of the research, the dentist's unique contribution to its completion, and the time involved in participation are a few of the many issues that must be resolved to the dentist's satisfaction.

Future Implications

As the field of health services research in dentistry develops and matures, new steps are being taken in support of these research efforts. In 2005, the National Institute of Dental and Craniofacial Research, at the National Institutes of Health (NIH), awarded \$75 million for three 7-year grants to develop practice-based research networks. These networks involve dentists in practice and establish a more "real-world" setting in which to assess dental practice and procedural issues with greater scientific rigor. Over the 7-year period, each network will conduct 12 to 20 short-term studies comparing the benefits and different outcomes of various and alternative treatment options, dental materials, and disease prevention strategies under a wide range of patient and clinical conditions.

Research in dentistry, and particularly in health services research, could be enhanced by dental schools increasing their emphasis on research as part of the curriculum. Dentistry and dentists would benefit from more involvement in

research. Increased utilization of electronic clinical records in dental practice would enhance opportunities and simplify the process of collecting data. Efforts to create greater uniformity for examination of records and developing more common data fields would also facilitate data collection and analysis.

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See also Dentists and Dental Care; Electronic Clinical Records; Employee Health Benefits; Health Insurance; Health Insurance Portability and Accountability Act of 1996 (HIPAA); National Institutes of Health (NIH)

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HEALTH SERVICES RESEARCH IN EASTERN EUROPE

Health services research investigates the relationship between the factors of access, cost, quality, and the organization of care and health and medical outcomes. This entry describes how health services research has developed in the Eastern Europe region. The region consisted of eight socialist countries at the time of the fall of the Soviet Union in 1991: Bulgaria, Czechoslovakia, Hungary, the German Democratic Republic, Poland, Romania, the Soviet Union, and Yugoslavia. After significant social and political change, these eight countries now represent 25 independent nations. Fifteen of them are successor states of the former Soviet Union: Armenia, Azerbaijan, Belarus, Estonia, Georgia, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Moldova, the Russian Federation, Tajikistan, Turkmenistan, Ukraine, and Uzbekistan. Ten other countries comprise the rest of the region: Bulgaria, Croatia, Czech Republic, Hungary, the former Yugoslav Republic of Macedonia, Poland, Romania, Serbia and Montenegro, Slovakia, and Slovenia. The Czech Republic, Hungary, Poland, Slovakia, and Slovenia joined the European Union (EU) in 2004. Bulgaria and Romania followed in 2007.

Healthcare During the Socialist Period

After World War II, from 1945 to 1990, Europe was divided by the Iron Curtain into two distinctive regions: the capitalist countries of Western Europe and the socialist countries of Eastern

Europe. The two regions followed very different patterns of development in their economies, public health, and healthcare. The 45-year socialist period can be viewed as one of the largest experiments in European history.

During the socialism period, the healthcare systems of the Eastern European countries were dominated by the Soviet Union and the rule of the state. The state became responsible for organizing, managing, delivering, and financing all healthcare services. In many Eastern European countries, healthcare coverage became universal, based on citizenship, and most healthcare services were provided officially free of charge. However, informal, under-the-table payments by patients to physicians were common. The informal payments were common because of the very low salaries of physicians. The number of physicians and hospital beds were high compared with Western European countries.

In terms of public health, the gap in life expectancy between the Eastern European and Western European countries was closing during the 1950s and early 1960s. However, from the mid-1960s, the health status in Eastern European countries stagnated or deteriorated, whereas in Western European countries it improved steadily. The age-standardized mortality rates rose in Eastern European countries and fell in the Western European countries. The gap in life expectancy was widening steadily, and the divergence had become even larger during the first half of the 1990s.

The economics of the healthcare systems of Eastern and Western European countries followed a similar pattern. The gap in healthcare expenditures between Eastern and Western European countries widened from 1960 to 1990. Healthcare expenditures, expressed in terms of purchasing-power parity, were comparable between the Eastern and Western European countries around 1960. In 1987, however, Western European countries spent four times more public funds on healthcare than Eastern European countries. Three years later, this gap became even larger. Healthcare expenditures decreased in the Eastern European countries from 1987 to 1990, just before the beginning of the social and political changes.

The widening gap in healthcare expenditures between the Eastern and Western European countries may have contributed to the significant gap in life expectancy. The problem, however, was not

only the smaller amount of money spent on healthcare but also the ineffective spending and the distribution across sectors. The former policy-makers of Eastern European countries attached great importance to demonstrating the power of socialist healthcare in terms of quantity. They emphasized hospital care instead of primary care, and thus they increased the total number of hospital beds and physicians, instead of focusing on the effectiveness and the quality of healthcare. Around 1990, the number of physicians per 1,000 population was 2.52 in Western European countries compared with 4.07 in Eastern European countries. The number of hospital beds per 1,000 population was 37% higher in Eastern European countries. These policies decreased the already limited resources in areas such as public health, health promotion and prevention, and health information systems. And it became clear that this approach did not lead to better health outcomes.

Before 1990, hospitals in Eastern European countries were financed through global budgets, which were calculated or based on historical costs and many other noneconomic factors. There were no financial incentives for cost containment or cost-effectiveness. The first formal steps toward healthcare reform occurred around 1990. At the time, it was recognized that the social security functions of retirement pensions and health insurance could not be reformed without restructuring the entire healthcare system of each country.

Restructuring the Healthcare Systems

After the fall of the Soviet Union, a peaceful revolution took place in Eastern European countries. Social and political changes were accompanied by two phenomena: the economic performance, including net material production and industrial output, fell markedly, which led to a decrease in the gross domestic product (GDP), and the health status of the population declined.

After 1990, many Eastern European countries decided to return to the Bismarckian tradition of solidarity based on social insurance of their healthcare system. Leaving behind the former Soviet-type system, compulsory health insurance schemes were introduced. The application of purchaser-provider

approaches resulted in the separation of healthcare providers, including general practitioners, outpatient care, hospitals, and healthcare-financing agencies, such as health insurance funds. Countries such as Hungary and Slovenia decided to establish a single healthcare financing agency, while other Eastern European countries preferred to allow many types of health insurance. Countries with multiple-payer systems include the Czech Republic, Poland, and Slovakia. In Hungary, the former National Institute of Social Security was divided into the National Health Insurance Fund Administration and the National Pension Fund Administration, while the Social Insurance Fund's budget was divided into the Health Insurance Fund and the Pension Insurance Fund.

Under the past socialist system, the Eastern European countries' primary method of healthcare financing was through global budgets. After the political shift, many of the countries introduced novel payment mechanisms for healthcare financing, including fee-for-service, Diagnostic Related Groups (DRG), and capitation.

In the past, the former policymakers of the Eastern European countries had little interest in the effectiveness of health services interventions. Important tools of health policy decision making were not used in healthcare systems. During the past two decades, however, efforts have been made in many Eastern European countries to strengthen the institutional resources and tools of health policy decision making.

The Development of Health Services Research: The Case of Hungary

After the fall of the Soviet Union, Hungarian researchers were sent to foreign universities to receive formal academic training in health services research. At the time, this was the only way for many young researchers in Eastern European countries to obtain advanced degrees in health services research, because health services research topics were not included in their educational systems. The cost of education for these researchers was covered mainly by a World Bank loan. A few years ago, after evaluating various projects in Hungary, the World Bank concluded that the most successful and sustainable project was the one that invested in human infrastructure. By

2000, this effort successfully produced a corps of highly trained Hungarian experts with internationally acknowledged qualifications and experience in health services research. However, because of the lack of appropriate academic and governmental institutions, many highly qualified researchers decided to stay abroad, and they were lost to the Hungarian healthcare system. Furthermore, many of those researchers who did return to Hungary have been employed in the private sector.

Some of the researchers who returned to the country after receiving their advanced degrees abroad became the core team that further developed health services research in Hungary. They helped form a number of academic institutions and departments, including the Health Services Management Training Centre at Semmelweis University in Budapest, the School of Public Health at the University of Debrecen in eastern Hungary, the Health Economics and Health Technology Assessment Unit at Corvinus University in Budapest, and the Department of Health Insurance and Health Policy at the University of Pecs in southern Hungary. Later, the Health Economics Research Centre was established at Eotvos Lorand University in Budapest and the Institute of Health Economics at the University of Szeged in southern Hungary.

A key issue of Hungarian healthcare policy was the introduction of cost-effectiveness concepts and methods into the decision-making process. The first step toward achieving greater cost-effectiveness was the establishment of methodological standards published by the Hungarian Ministry of Health. These standards regulate the guidelines for conducting economic evaluations. The aim of the guidelines is to encourage rational, transparent public-healthcare-spending decisions. The guidelines are continuously being refined and evaluated every 2 years.

The Hungarian Health Economics Association was founded in 2003 and has a current membership of about 100 individuals. The association holds monthly meetings where presentations are made on various health economic topics. The meetings serve as an interdisciplinary forum for healthcare professionals in the field of health economics, health services research, and health technology assessment.

The Hungarian National Health Insurance Fund Administration launched a program for monitoring the quality of hospital care in 2002. This quality indicator program, a pay-for-performance type of program, helps the national insurance fund strengthen its purchasing role of obtaining high-quality health services. The fund has decided to develop this indicator system for measuring and evaluating the quality of health services to support overall quality improvements. The national insurance fund seeks to ensure, in all possible ways, that everyone can find the evaluation points adequate to their field of interest—that is to say, that the financial point of view is not dominant in the development of the indicator system.

As a requirement for membership in the EU, which Hungary joined in 2004, the country was required to have a transparent, accountable coverage process applied by the national health insurance fund for the pricing and reimbursement of pharmaceuticals. To meet the EU transparency requirements, Hungary passed the appropriate legislation in April 2004. Since that time, anyone who wants to be reimbursed for the cost of certain drugs must submit a formal application according to the EU directives.

Perhaps the most important change resulting from EU membership has been the increased professionalization of Hungary's decision-making process. It has resulted in the application of scientific evidence in coverage decisions, equity, cost-effectiveness, publicity, transparency, accountability, and the consideration of budget constraints.

In 2004, the National Institute for Strategic Health Research was established to guide Hungary's governmental health policy decision making by undertaking activities in four areas: (1) health informatics and information policy, (2) health economics, (3) health services and health system research, and (4) the health technology assessment and coverage policy. The establishment of the institute was an important step toward the inclusion of health services research into the governmental decision-making process. The institute serves as an important resource for the Ministry of Health and the National Health Insurance Fund Administration.

During the development of health services research in Hungary, researchers studied the healthcare systems of a number of countries,

including Australia, Sweden, the Netherlands, the United Kingdom, and the United States. They also studied the published international literature, particularly focusing on health insurance coverage policies, prescription drug pricing and reimbursement, healthcare technology assessment, price/volume agreements, Diagnosis Related Groups, evidence-based guidelines, and performance measurement. Subsequently, these studies have made a significant impact on Hungarian health policy decision making.

Hungarian health services researchers are currently addressing topics such as (a) the overall access to healthcare, (b) inequalities in access and utilization of health services, (c) cost containment strategies, (d) quality-of-care improvements, and (e) the efficiency of resource allocation.

Future Implications

After the fall of the Soviet Union, the former socialist countries of Eastern Europe underwent fundamental social and political changes, which greatly influenced their healthcare systems. One of the greatest challenges faced by these countries was the restructuring of their Soviet-type socialist state healthcare systems into modern health insurance-based systems. Since that time, there has been a gradual development of health services research in the Eastern European countries. This development included the training of professionals, the establishment of academic departments, the development of new public policies and recommendations in line with those of the EU and other international organizations, the strengthening of public institutions, and the inclusion of health services research and related fields in the government decision-making process. These achievements serve as a strong base for the future development of health services research activities and projects, especially in the field of international collaborations.

Imre Boncz

See also Comparing Health Systems; Health Economics; International Health Systems; National Health Insurance; Payment Mechanisms; Public Policy; Technology Assessment; World Health Organization (WHO)

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HEALTH SERVICES RESEARCH IN GERMANY

Health insurance plays a vital role in the supply and demand of healthcare. Health services researchers in Germany and the United States study the function and nature of health insurance, the various types of insurance plans, and the impact of insurance on healthcare. The German healthcare system provides valuable lessons for the United States and other countries that are trying to develop health insurance programs that are universal in scope and comprehensive in coverage. Furthermore, the growing literature on comparative health insurance policies suggests that nations are learning from each other.

Background

Germany pioneered national health insurance. It was the first nation in the world to enact

compulsory health insurance legislation. In 1883, the conservative politician and German Chancellor Otto von Bismarck (1815–1898) devised a system of health insurance coverage, as well as accident insurance and old-age pensions. Specifically, he established the Statutory Health Insurance System and other programs to improve the situation of the country's large working class, to coopt similar socialist proposals, and to win an upcoming election.

Traditionally, the German population has enjoyed a very high degree of free access to both healthcare providers and healthcare insurers. In 2007, the Statutory Health Insurance System was composed of about 240 fiscally autonomous sickness funds, which insures about 86% of the total German population. These funds are compulsory for those earning less than 3,975 euros a month and for individuals who are unemployed, students, disabled, pensioners, poor, and homeless. Contributions to the funds are based mainly on wages and salaries and are obtained through a payroll tax. In 2006, the average contribution rate was 13.25%.

Individuals with a salary above the income level or who are self-employed can either voluntarily remain in the social healthcare system or opt out of it and purchase comprehensive risk-related private health insurance coverage. In 2007, a little more than 10% of the population was enrolled in a plan from 1 of 52 private health insurance companies. Until the most recent government reform, private health insurance companies increased their reserves to guarantee lower premiums for insuring older individuals. Thus, it became less attractive to switch from one to another private insurer the longer the individual stayed in a particular plan.

Miners, sailors, farmers, and soldiers may enroll in other social insurance programs, so that altogether the entire German population is insured against the risk of illness and they have comprehensive healthcare benefits.

Infrastructure and Government Reform Efforts

Compared with other industrialized nations, Germany's healthcare infrastructure is well developed, providing easy access to physicians, nurses,

pharmacists, and other healthcare providers. The ratio of healthcare providers to population in Germany is above the average of Organization for Economic Co-operation and Development (OECD) countries.

In terms of utilization, the German population tends to overutilize healthcare services. Therefore, government policymakers have recently introduced a number of measures to restrict and limit utilization of services and provide stronger guidance for patients. For example, in 2004, for the first time in the German health systems' history, a government reform introduced user fees to curb the utilization of outpatient healthcare services.

The latest government reforms, the Statutory Health Insurance Modernization Act of 2004 and the Statutory Health Insurance Competition Strengthening Act of 2007, promoted more coordination of care by restricting patient choice and helped patients to better navigate the healthcare system. The 2007 reform significantly changed the system by encouraging competition among healthcare providers and health insurers.

An earlier reform, the Health Care Structure Act of 1993, introduced for the first time free choice among the sickness funds for the majority of the insured. Since then, the German healthcare system has increasingly become more competitive.

Both the Coalition Government of Christian Democrats and the Liberal Party (1982–1998), and the coalition of Social Democrats and The Greens (1998–2005) were faced with increasing healthcare expenditures and felt pressured to apply stricter healthcare cost containment measures. Thus, various government reforms during the past 20 years have steadily increased both the level of copayments and the number of copayments imposed on prescription drugs and health services.

The *Social Code Book V*, the legal framework for the German Social Health Insurance System, stipulates that the system must provide all medically necessary services. Compared with other OECD countries, the German system provides a broad set of benefits. For example, it covers outpatient and inpatient services, medications, dental care, and rehabilitation services. Some services, however, are excluded from coverage, but they have not caused any access problems so far. The specific healthcare services offered by the sickness funds are determined by law. And the funds offer

95% of all required services. The sickness funds, inpatient and outpatient healthcare providers, and the Federal Joint Committee jointly determine which services are reimbursable. The Federal Joint Committee is a decision-making body comparable with the United Kingdom's National Institute for Health and Clinical Excellence (NICE).

The importance of integrated-care contracts has continually grown over the years. Most of these contracts are regional in scope and cover certain diseases and treatments (e.g., heart disease and artificial hips).

Some of Germany's healthcare organizations have changed over the past decades. For example, polyclinics were frequent providers of healthcare in the former German Democratic Republic (GDR/East Germany). After the German reunification in 1990, most of these polyclinics closed and were replaced with outpatient care centers organized as in the western German states. Today, only about 30 polyclinics still exist, and most of the former polyclinics now operate as outpatient care centers. The 2004 government reform led to a renaissance of outpatient care centers in the entire country. On average, the new outpatient care centers, which are generally managed by physicians or hospitals, have a staff of four physicians.

Future Implications

The German healthcare system will likely continue to evolve. It may incorporate cost and quality-of-care concepts from other countries, including the United States, and other nations, including the United States, may attempt to expand insurance coverage similarly as the German system.

Klaus-Dirk Henke

See also Comparing Health Systems; Healthcare Financial Management; Health Economics; Health Insurance; International Health Systems; National Health Insurance; Public Health

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World Health Organization Office for Europe: <http://www.euro.who.int>

HEALTH SERVICES RESEARCH IN SUB-SAHARAN AFRICA

Health services research in sub-Saharan Africa differs from its North American and European counterparts in several ways. It is often referred to as logistics research or operations research, and care delivery is severely resource constrained. The shortage of staff, transportation, supplies, and equipment leads to differences in the types of care provided. Health services research in literature from sub-Saharan Africa is focused on the major diseases and health conditions confronting this part of the world. Thus, this type of research is largely organized and funded around major health conditions, such as malaria, tuberculosis, measles, meningitis, diarrhea, HIV/AIDS, infant and child health, and maternal mortality/morbidity.

Health Conditions

In 2006, more than 65% of the total people in the world who suffer from HIV/AIDS (the human

immunodeficiency virus) are found in sub-Saharan Africa. This erosion of the immune system results in tuberculosis and pneumonia, which are the immediate cause of death. Major risk factors for HIV/AIDS in this region are unprotected sex, multiple sex partners, and the transfer of the virus from the mother to the fetus during pregnancy. In sub-Saharan Africa, women aged 15 to 24 years are considered to be at high risk of contracting HIV/AIDS. Currently three quarters of the documented cases are found among this group. Almost 6 million people in sub-Saharan Africa are in need of medical treatment. Organizations such as the Joint United Nations Programme on HIV/AIDS (UNAIDS) and the World Health Organization (WHO) are working to provide antiretroviral treatment to 3 million individuals. Additional goals may be set by other organizations to support the initiative.

Malaria is predominately spread by the female anopheles mosquito and accounted for more than 1 million deaths in 2005. Between 350 and 500 million cases are reported worldwide each year. More than 80% of the world's malaria deaths occur in Africa. The disease accounts for 18% of all child deaths in the sub-Saharan region. The major prevention strategies for malaria control include the use of insecticide-treated mosquito nets and indoor insecticide sprays. Some African mosquitoes have developed resistance to many antimalarial medications, making treatment more difficult and the costs of care more expensive.

A total of 7.7% of deaths in Africa were caused by diarrhea and its related complications in 2006. Diarrhea is a symptom of infection from bacterial, viral, and parasitic organisms primarily spread through contamination of water and food. Most deaths result from dehydration, and children are at higher risk than adults. The majority of treatments include oral rehydration, which is a low-cost therapy.

Tuberculosis (TB) is a frequent killer of the individuals who suffer from HIV/AIDS. It is estimated that more than half of the people living with HIV/AIDS will contract TB during their lifetime. In some regions of sub-Saharan Africa, up to 70% of individuals with sputum smear-positive pulmonary tuberculosis are HIV-positive. About 8 million new cases develop each year in the world. Symptoms of tuberculosis include a

chronic cough, high fever, weakness, and drastic weight loss. It is spread through indirect contact, mostly through coughing or sneezing. Treatment includes the use of Bacille Calmette-Guerin (BCG), which is commonly used as a preventive measure against TB in Africa. One of the major approaches to the treatment of TB is Directly Observed Therapy Short-Course (DOTS). Under DOTS, health workers closely monitor the treatment to ensure that patients complete the full course of medication, preventing the development of new, drug-resistant strains of TB. The DOTS strategy has proven to be an effective medical approach.

Africa accounts for more than a third of the world's annual deaths associated with measles. This virus causes approximately 345,000 deaths worldwide each year, mostly among children. More than 20 million people are affected with this virus every year. Measles can cause blindness and brain damage, and it also induces children's susceptibility to pneumonia and diarrhea. It is highly contagious and spreads mostly through coughing and sneezing. Vaccination is extremely effective against the disease. Since the cost of immunization is approximately \$1 for each child in Africa, the Measles Initiative and the World Health Organization/United Nations Children's Fund (UNICEF) Strategy for Sustainable Measles Mortality Reduction aim to reduce measles deaths with comprehensive vaccination programs. Since its implementation in Africa in 1999, there has been an overall drop of 60% in all documented measles cases.

Tetanus in sub-Saharan Africa leads to 84,000 deaths every year and a total of 2 million deaths worldwide. Tetanus is a potentially fatal disease of the central nervous system. It most commonly originates in wounds that become infected with bacteria. Neonatal tetanus passes from the mother to the fetus.

The "Meningitis Belt" has the world's highest rates of patients infected with the disease. This geographical region includes Senegal in western Africa, stretching to Ethiopia in the east. Meningitis, a frequently fatal bacterial disease, infects the membranes of the brain and spinal cord. Burkina Faso was the first African country to experience an epidemic of a new strain of meningitis known as W135. In 2005, the world price of the vaccine

ranged from \$4 to \$50, which is unaffordable in many African nations. The WHO and other global health organizations are currently negotiating to lower the price of the vaccination, making it more affordable.

Health Services Research Activities

As a result of concentrating on specific disease conditions, health services research in sub-Saharan Africa is often published and presented in disease-specific journals and conferences, as opposed to health services research-specific publications and events. These conferences include the Union World Conference on Lung Health and the International AIDS Conference. Additional health services research from the region can be found in the gray literature of unpublished dissertations, government briefs, and the reports of nongovernmental organizations (NGOs). Problems that are of great focus include issues related to poverty, vulnerable populations, distance traveled, shortage of healthcare workers, lack of supplies, and irregularity of available medications. Research studies conducted in sub-Saharan Africa tend to collect primary data on a small group of individuals, relying on hundreds of respondents and subjects as opposed to thousands. Large computerized longitudinal databases and secondary data analyses are not typically used in the sub-Saharan African health services research. Survey instruments often require translation into local languages, and there is an identified need for repositories of such translations.

A large portion of health services research in the region is underwritten by international agencies and nongovernmental organizations. Frequent topics include the cost-effectiveness of scarce resources applied to treatment. Vulnerable populations are the main area of focus, with nearly half of the published articles in the medical literature addressing women and about 40% focusing on children. Communicable disease control is another major area of focus in the developing world, reflected in the health services research articles coming out of sub-Saharan Africa, which are overwhelmingly disease specific. AIDS is the primary focus of these articles, representing more than 16% of works. Primary care, poverty, bioethics, malaria, TB,

cancer, and vaccines represent the remaining articles, in descending order of frequency.

Professional society membership, dedicated journals, focused-funding organizations, large libraries, and dedicated faculty positions define the social structure of health services research in North America. These structural elements are lacking in sub-Saharan African health services research. Relevant journals such as *East African Journal of Medicine* are not easily accessed, especially in electronic versions. Researchers are often unaware of the work of others and are unlikely to cite coexisting research in the area, making it difficult to locate relevant articles through citations and citation scores. In spite of these barriers, there is a rich, high-quality body of health services research from this region. A recent examination of scientific articles showed that from a total pool of 44,000 articles worldwide, approximately 1,300 articles dealt with topics in sub-Saharan Africa.

Future Implications

The field of health services research in this area of Africa has some advantages. This research can be carried out at low cost and often with high response rates. Some health interventions have low costs and large health benefits. Perhaps because of this, cost-benefit analysis is a more acceptable analytical method. Graduate education in this area of study is available in sub-Saharan Africa—for example, at Makerere University in Uganda. Local faculties prefer to assign articles that include authors and coauthors from the region. Local researchers are well aware of their health problems and are interested in studies that show how to improve them. There is a need for a core, accessible group of excellent articles on health services research to be available for teaching purposes.

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See also Access to Healthcare; Acute and Chronic Diseases; Health Literacy; Health Services Research, Definition; Infectious Diseases; Public Health; Public Policy; World Health Organizations (WHO)

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HEALTH SERVICES RESEARCH IN THE PEOPLE'S REPUBLIC OF CHINA

During the past 25 years, the People's Republic of China has undergone tremendous social change and economic growth. China's healthcare system, however, has failed to keep pace with many of these changes. As a result, China has a growing need to improve its delivery of healthcare to its people in both rural and urban areas. Health services research has begun to play an important role in guiding this effort, with its emphasis on the issues of access, cost, quality, and the outcomes of healthcare.

History

Researchers from the United States introduced health services research to the People's Republic of China in the early 1980s. Specifically, in 1981, the Shanghai Medical University, School of Public

Health, conducted the first health services research in China. This initial research examined the utilization and provision of healthcare in Shanghai using a household interview survey. Based on the results obtained, a comparison of health outcomes between Shanghai and Washington, D.C., revealed that the health status of these two cities was similar. The results suggested that the similarity of health outcomes in China was due to the wide coverage of basic healthcare services provided by a healthcare system that was composed of the government's welfare plan, labor insurance, and the collective health systems. The comparison with Washington, D.C., also revealed that Shanghai spent substantially less on health expenditures.

Since the 1980s, Chinese health services research has proliferated, and it has been applied to many projects at both the local and the national levels. The original Shanghai Household Interview Survey assessed past episodes of illness, the use of health services in the past 2 weeks, and the number of hospitalizations in the past year, as well as surveying outpatient use. Since then, these initial assessments have been expanded to include various types of healthcare services. China has also developed the National Health Service Survey, which has been conducted in the years 1993, 1998, and 2003 throughout the various regions of the country.

Current Research

Over the past decades, health services research in China has focused on the growing unmet healthcare needs of the country, healthcare utilization, financing, costs, quality, access to care, and healthcare reform. Currently, China is considering whether its healthcare system should be more of a free-market system or a revised, centrally planned system. Health services research is helping the government to make this decision.

One critical issue China is facing is the rapidly rising healthcare costs. This increase is a result of more severely ill patients seeking healthcare, the use of new medical technologies, and the overprescribing of medications. The high cost of healthcare in China has made it unaffordable for many of the poor, resulting in a decrease in the demand for healthcare.

Another important issue of concern is the underutilization of healthcare providers in China due to reduced patient demand. As the number of healthcare providers has increased, patient case-load and occupancy at township hospitals has decreased. As a result, provider productivity has declined accordingly.

Health services research studies have shown that China, like other countries, has a limited system to monitor and ensure the quality of its healthcare. The skill level of healthcare practitioners has been found to be low, especially at the village level. Additionally, a large body of evidence suggests that some level of wasteful, inefficient, and/or inappropriate care is being delivered in China, particularly in the overprescribing of medications. Although evidence shows that healthcare quality in China has been improving, the improvements are mostly restricted to large urban areas. Furthermore, despite the general satisfaction with providers' attitudes and service delivery, dissatisfaction with physician communication concerning patients' health status, as well as conflict between providers and family members, appears to be common.

Inequities in the delivery of healthcare between urban and rural areas and across income groups further complicates China's healthcare system. Currently, the healthcare delivery system in urban areas is far more developed than in rural areas, and the gap in the quality of care between these areas continues to grow.

The reasons for the Chinese healthcare system's shortcomings continue to be investigated. Some analysts blame China's health service deficits on the country's movement away from a centrally planned healthcare system, while others look to decentralization and the adoption of a market economy as a much needed remedy. These counterperspectives have important implications for healthcare reform, especially as China debates the merits of competition versus government intervention in healthcare. Research assessing the consequences of competition between providers, as well as across and within markets, would be useful in informing this controversy and in setting future policy.

China's current fee-for-service payment structure and third-party payer system has resulted in the overprovision of services in more profitable areas of care. Additionally, because reimbursement

for simple noninvasive care is set below cost and high-tech diagnostic care is set above cost, the former is generally underprovided, while the latter is overprovided. As a consequence, healthcare costs have escalated in concurrence with the rapid adoption of new medical technologies. Provider incentives that encourage longer patient hospitalization have also contributed to the rising costs.

Other health services research studies on provider performance in China have shown that providers respond to changes in payment arrangements. A study that examined prospective payment in Hainan Province hospitals found that the average expenditure for admission decreased to below the level of other hospitals that were paid on a fee-for-service basis and the growth in spending on high-tech services declined. Another study showed that when the city of Shanghai switched payments for its government insurance program to capitation for outpatient care, escalation of costs slowed.

China's transition from a referral-based system to one that allows patients to choose the level of provider that they can afford has caused the overutilization of higher-level provincial and county hospitals, mostly by high-income patients. Meanwhile, lower-level township hospitals typically are underutilized and used mostly by indigent patients. Furthermore, studies have found that the decentralization of China's healthcare system has created greater inequity between richer and poorer regions. It also has led to overlapping and fragmented services.

Some of the issues highlighted above regarding China's healthcare system are due to inappropriate, unnecessary, or lack of government intervention. Other issues also reflect the government's concern with taking an active and positive role in healthcare service delivery. The overall findings of health services research studies have led to a greater understanding of the system and provided the basis for policymakers and program managers to continue to monitor, evaluate, and improve the effects of China's healthcare reform efforts.

Future Implications

Although the People's Republic of China has made significant progress in certain areas of its healthcare system, such as in reducing infant

mortality and increasing life expectancy, improvements in other areas are needed. The lack of funding of needed healthcare programs and the lack of access to affordable and high-quality care are of concern. Because of the various shortcomings in China's healthcare delivery system, a growing need exists for more well-designed health services research studies to guide the ongoing healthcare system reform efforts in rural and urban areas. Health services research has begun to play a pivotal role in improving the quality of life of the Chinese people, and it will continue to play an integral role in the ongoing transformation of China's healthcare system.

Wei Liu and Judith Levy

See also Access to Healthcare; Comparing Health Systems; Cost of Healthcare; Healthcare Markets; International Health Systems; Public Health; Quality of Healthcare; World Health Organization (WHO)

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Web Sites

- China Health Economics Institute (CHEI): <http://www.nhei.cn/english>
- World Bank: <http://econ.worldbank.org>
- World Health Organization (WHO): <http://www.who.int>

HEALTH SERVICES RESEARCH IN THE UNITED KINGDOM

In the United Kingdom, health services research is seen as being research that, from its inception, aims to improve the quality and efficiency of health services. In turn, a high-quality health service is seen as one that is effective, humane, and equitable. The concerns of health services research in the United Kingdom differ somewhat in emphasis from those in the United States, reflecting differences in the history of its development. To understand the role of health services research, consideration must be given to its development, current organization, funding opportunities, academic efforts, literature, and research capacity and training. Despite major achievements in this area over the past two decades, challenges and opportunities still exist. Although many of the key features of health services research are similar in all four jurisdictions in the United Kingdom, this account focuses on the largest, England.

History

Researchers at the London School of Hygiene and Tropical Medicine were the first in England to formally adopt the term *health services research*, starting a discussion on the topic in 1988. Research on health services, however, has a long history in the United Kingdom. In the mid-19th century, Florence Nightingale (1820-1910) was not only proposing how hospitals and nursing should be organized, but as a statistician, she was also assessing the performance of providers and comparing the outcomes of London hospitals. By the end of the century, Henry Burdett, a leading hospital administrator, was systematically collecting data on the resources and activities of hospitals and dispensaries throughout the country, which he compiled in extensive annual reports. In the early 20th century, E. A. Groves, a surgeon in Bristol, was advocating the need for standardized reporting of clinical cases such that comparisons of the effectiveness of care could be undertaken.

While such individual contributions were important, they represented isolated initiatives without any systematic support. In 1913, the government

established the Medical Research Council (MRC) to support and promote medical research. Although this effort included some limited funding for what is now called *health technology assessment*, its interests extended no further into health services research. The most significant early achievement of the MRC was the funding of the first randomized controlled trial (RCT) in the world, which dealt with the treatment of tuberculosis. It represented a major challenge to the traditional notion of “evidence,” which had been based largely on physicians’ observations and experiences. Other RCTs followed, culminating in 1972 with the publication of the seminal book *Effectiveness and Efficiency*, written by Archibald L. Cochrane (1909–1988), a medical epidemiologist, and funded by the Nuffield Provincial Hospitals Trust. Meanwhile, a more radical challenge to medical knowledge was being developed by a medical demographer, Tom McKeown, who, in his book *The Role of Medicine*, suggested that healthcare had made only a modest contribution to improvements in population health compared with environmental, nutritional, and social changes.

Although both Cochrane and McKeown had practiced clinically, they focused on public health or social medicine rather than clinical medicine. Unlike the United States, where health services research had its origins largely in internal medicine, in the United Kingdom, work on evaluating healthcare and challenging the established tenets of medicine was housed in public health. This persists to the present day and has influenced the focus of British health services research. The focus in the United Kingdom has also differed from that in the United States in two other ways. First, there is less concern about cost and cost containment, reflecting the existence of a global, capped budget and a greater focus on effectiveness and cost-effectiveness (reflecting not only the field’s origins in public health epidemiology but also the existence and acceptance of mechanisms for explicit rationing). Second, there is less focus on the influence of race and ethnicity on equity and more focus on socioeconomic status.

The development of health services research during the 1970s and 1980s was fairly piecemeal. The English Department of Health recognized its importance by establishing and supporting some research units, in particular at St Thomas’ Hospital

Medical School in London and at the University of Sheffield. The MRC continued to provide some funds, though it principally supported laboratory and clinical research. Despite this, it was the latter that the House of Lords Select Committee on Science and Technology were more concerned about when they deliberated on the country’s research needs in 1986. The Lordships’ conclusion was that the National Health Service’s (NHS) greatest need was for research on health services and, to a lesser extent, public health. In 1991, the NHS Research and Development Programme was established under its first director, Michael Peckham, a medical oncologist with management experience in academic medicine.

The following 5 years were extraordinarily productive and exciting for the field of health services research in the United Kingdom. The Cochrane Collaboration, an initiative led by a medical epidemiologist, Iain Chalmers, was established built on a pilot project in obstetrics and neonatal care. The initial aim of the Collaboration was to assemble all the RCT evidence on the effectiveness of healthcare and to synthesize it to produce policy and practice recommendations. Although it initiated in the United Kingdom, the Cochrane Collaboration rapidly expanded to become one of the largest, most comprehensive initiatives ever undertaken in the healthcare field.

Meanwhile, in England, new commissioned research programs were being established. For the first time, researchers, managers, and lay people were contributing to identifying research priorities and commissioning studies in areas that had often been neglected. Starting in 1992 with mental health and learning disability, seven national programs were established over the following 3 years. In time, these were replaced with two major programs focused on health technology assessment (HTA) in 1994 and service delivery and organization (SDO) in 1999. In addition, reviews of a wide range of methods needed in health services research were commissioned, which resulted in a series of monographs, an extensive textbook, and a shorter handbook providing state-of-the-art accounts for researchers.

Those early initiatives culminated in the first Scientific Basis of Health Services conference in London in 1995, an international gathering that subsequently traveled the world, including

Amsterdam, Toronto, Sydney, and Washington, D.C., with biannual meetings over the following decade. Meanwhile, the NHS Research and Development Programme flourished, with both the HTA and SDO programs growing in size and stature. The SDO programs addressed the methodological challenges in conducting research on the organization of services, published two books, and have increasingly encompassed the challenge of knowledge transfer to managers and policymakers.

After a few years of consolidation and stability, the NHS Research and Development Programme was redesignated as the National Institute of Health Research (NIHR) in 2006. While the funding streams and support for the field were unchanged or enhanced, leaders called for greater central direction and more transparency of the funds that had traditionally been allocated to NHS providers, mostly hospitals, to support research infrastructure and medical academic posts. Even while these changes were being introduced, the government, and in particular the Treasury, became increasingly concerned about the division of responsibility for health research between the NIHR and the MRC. This concern culminated in 2007 with proposals to move the NIHR away from the Department of Health (DH), creating an independent agency while at the same time ensuring that it pursued a coordinated policy with the MRC under an umbrella body, the Office for Strategic Coordination of Health Research (OSCHR). The impact of these changes is awaited.

Funding

The debate as to whether the responsibility for public funding of health services research should lie with the DH or the MRC has been going on for several decades. The compromise solution had been for the DH to fund the more applied, policy-oriented studies, leaving the MRC to fund micro, evaluative research with a particular focus on the clinical effectiveness and cost-effectiveness of specific healthcare interventions. Another difference has been that the DH has mostly used its funds to commission research, while MRC funds have been devoted to responsive or investigator-led studies. The DH has also funded research units, including—in addition to the two mentioned earlier—the

Primary Care Research and Development Centre in Manchester, the Nursing Research Unit in London, and the Centre for Health Economics in York. And from the start of the NHS Research and Development Programme in the early 1990s, regional research and development support units were established in the NHS to try to spread research activity away from the “centres of excellence” in leading universities and to encourage the uptake of research evidence into clinical practice.

With the establishment of a single research fund in 2007, the NIHR has become the lead organization responsible for coordinating all public funding of health services research, including that provided by the MRC Health Services and Public Health Research Board. The only element of public funding not included is the Economic and Social Research Council (ESRC), which provides some support for social science research on health services. In addition to public funding, some charities and foundations also provide funding, in particular the Nuffield Trust and The Health Foundation.

Organizations, Journals, and Training

Although quintessentially a multidisciplinary and multiprofessional activity, health services research in the United Kingdom continues to be fragmented intellectually. Researchers have tended to retreat to the safety and confines of their own disciplinary organization: the epidemiologists to the Society for Social Medicine, sociologists to the British Sociological Association Medical Sociology Group, and economists to the Health Economics Study Group. This has been unsatisfactory for several reasons. First, it has discouraged multidisciplinary research and exchange. Also, within each disciplinary organization, attention to health services research has inevitably been diluted by other, more dominating interests of each discipline. It has impeded the development of a higher profile for the field. In addition, this area of study has been fragmented between key areas of healthcare. Too often, researchers have focused their energies exclusively in topic- or profession-oriented organizations such as the Health Services Research and Pharmacy Practice Group, the United Kingdom’s Federation of Primary Care Research Organizations, and the Royal College of Nursing Research Society.

After at least two decades of unsuccessful attempts to establish an organization to unify the field in the United Kingdom, the Health Services Research Network was established in 2005. Nested within the main membership organization that represents NHS bodies, both purchasers and providers, it has similar aims to those of AcademyHealth in the United States. The development of a more coordinated and coherent presence for health services research has also been enhanced by the decision by the Higher Education Funding Councils to designate, for the first time, health services research as one of the 67 areas that make up the whole of academia for the all-important Research Assessment Exercise in 2008. This assessment is held every 7 years.

In the United Kingdom, the field depended largely on generalist journals, such as the *British Medical Journal* and the *Lancet*, for publishing its output until the 1980s. Research of a clinical nature could also be published in specialist medical journals. While encouraging the interest of clinicians, this practice may have exacerbated the fragmentation of health services research. The alternative for researchers has been single-disciplinary journals, such as the *Journal of Epidemiology and Community Health*, *Journal of Health Economics*, *Social Science and Medicine*, and *Sociology of Health and Illness*. American subject-specific or generalist journals have rarely been interested in research from the United Kingdom. However, over the past 20 years, the situation has improved with the establishment of some subject-specific journals in the United Kingdom, including *Health Services Management Research*, *Quality and Safety in Health Care*, *Journal of Health Services Research and Policy*, and *Journal of Evaluation of Clinical Practice*.

The capacity to conduct health services research has steadily increased. There are now many relevant Masters' level courses available, some providing a broad, multidisciplinary introduction and others focusing on one of the relevant disciplines. And with the development of research units and departments in universities, opportunities for doctoral studies have grown. Like other areas, funding for students remains the limiting factor. Fellowships, particularly doctoral and postdoctoral, are provided by the two principal sources of public funding, the MRC and the NIHR. In addition, the

Health Foundation has targeted particular groups such as nurses and allied health professionals.

Major Achievements

The profound impact that health services research has had on health services in the United Kingdom is not sufficiently recognized. Despite all the challenges that the field has faced and its low level of resources and support compared with biomedical and clinical research, it has had an immense influence on healthcare policy and the way health services are organized, managed, and regulated. The key features of the NHS have largely been driven by the challenges thrown down by leaders in the field in the 1970s and the subsequent research carried out since the 1980s that revealed unjustifiable variations in the performance of healthcare providers. This research provided policymakers and managers with the confidence to challenge established, unquestioned medical views and to require providers to be publicly accountable. These measures have included demands for rigorous demonstration of the effectiveness, humaneness, and equity of care, which is the basis of contemporary performance management and regulation. In parallel, requirements to justify the rapidly increasing expenditure on healthcare resulted largely from economic research on the cost-effectiveness of interventions and on financial management.

Some of the main achievements of the NHS Research and Development Programme have been mentioned: (a) a shift in emphasis from responsive to commissioned research to meet the priorities and needs of the health service; (b) establishment of the Cochrane Collaboration, which has mapped out what is known and what is not known about what works in healthcare; (c) support for methodological research to enable health services research to become more rigorous and heighten its scientific status; and (d) recognition of the need for research not only on health technologies but also on the way services are delivered and organized.

Other key achievements have been the adoption of the field as a distinct unit of assessment in the universities' most recent Research Assessment Exercise and the development of high-quality clinical databases in some key areas of healthcare, including critical care, cardiac surgery, acute

myocardial infarction, that provide a productive base for research, planning, and patient management. The creation of the National Institute for Health and Clinical Excellence (NICE) and National Service Frameworks also arose from health services research's demonstration of variations in inputs, processes, and outcomes.

Future Implications

The field of health services research has historically faced the challenge of persuading both colleagues in biomedical and clinical research of its scientific worth and managers and policymakers as to its practical value. In addition, in the United Kingdom, there are several other challenges to be met. First, there is increasing focus in the NHS on the research needs of the pharmaceutical industry, which is seen as creating wealth for the country, rather than on improving the health of the public. Second, the field must learn to cope with the increasing diversity of healthcare providers as the government encourages greater competition. Third, there is a need for research to reflect the increasing integration of health and social care. Fourth, researchers have to gain sufficient political knowledge to handle the government's political ideology, which is decreasingly tolerant of research that questions its beliefs. Finally, there is the challenge of dissuading authorities of the need for inappropriate bureaucratic restraints on health services research in the name of protecting the ethical rights of the patients and the staff.

Given these potential obstacles, health services research can respond in several ways: (a) by enhancing patient/public involvement in research policy and priority setting, (b) by demonstrating the value of such research to health services and research funders, (c) by improving the transfer of research-based knowledge to policymakers and managers, (d) by assisting in improving the commissioning of healthcare, (e) by exploiting high-quality clinical databases for research, (f) by increasing clinician involvement in the field, and (g) by getting more involved in deploying rigorous methods in quality improvement initiatives. Given these opportunities, the future for health services research in the United Kingdom has much potential.

Nick Black

See also Comparing Health Systems; Equity, Efficiency, and Effectiveness in Healthcare; International Health Systems; National Health Insurance; Public Policy; Rationing Healthcare; United Kingdom's National Health Service (NHS); United Kingdom's National Institute for Health and Clinical Excellence (NICE)

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Web Sites

Cochrane Collaboration: <http://www.cochrane.org>
 United Kingdom's National Health Service
 (NHS) Confederation, Health Services Research

Network: <http://www.nhsconfed.org/specialist/specialist-1789.cfm>

United Kingdom's National Institute for Health
Research, Health Services Research Programme:
<http://www.hsr.nihr.ac.uk>

HEALTH SERVICES RESEARCH JOURNALS

Access to peer-reviewed journal literature is an important part of health services research. Two resources that help identify key journals in health services research are the Core Public Health Journals Project—Health Services Administration and the Institute for Scientific Information's annual *Journal Citation Reports (JCR)*. Most of these journals are indexed in the U.S. National Library of Medicine's PubMed database, and specialized queries are available to focus on the health services research literature.

Core Public Health Journals Project

In 2001, the Core Public Health Journals Project began with the purpose of identifying a list of core public health journals that every library in the field should have. Compiled and reviewed by public health librarians and public health professionals, this list will result in a database that helps the Association of Schools of Public Health in its accreditation process. The Public Health/Health Administration Section of the American Library Association (ALA) supports this ongoing and collaborative project. The list of core journals serves as a starting point for researchers performing systematic reviews of the health services literature. It is regularly updated, and the project plan calls for a new version of the list to be produced every 2 years. In 2006, the Core Public Health Journals Project received the Medical Library Association's Louise Darling Medal for Distinguished Achievement in Collection Development in the Health Sciences.

Modeled after the Brandon-Hill list, the Core Public Health Journals Project categorizes journals into three groups: (1) those journals that are essential for a library that has specialization in

public health and health administration, (2) publications that are important for research gathering but not essential to the library collection, and (3) publications that are of interest to practitioners. These core categories provide comprehensive coverage for journals and other publications that serve health service researchers and public health practitioners. The database also includes links to additional information about the journals, such as the International Standard Serial Number (ISSN), pricing, indexing of the journal articles within the PubMed database, and links to publishers' Web sites. Most of the journals in the list are indexed within PubMed. Health services researchers would be most interested in the core list subject of Health Services Administration.

Essential Core Publications

The Core Public Health Journals Project identifies those publications that are considered essential for libraries specializing in the field of public health and health administration. The 2006 Essential Core list for the subject of Health Services Administration includes the following: *Administration and Policy in Mental Health*, published by Springer 6 times a year; *American Journal of Managed Care*, a monthly journal published by Medical World Communications; *Health Affairs*, published 6 times a year by the University of Pennsylvania; *Health Care Financing Review*, a subscription quarterly journal of the Centers for Medicare and Medicaid Services (CMS); *Health Care Management Review*, a bimonthly publication from Lippincott, Williams & Wilkins; *Inquiry*, a quarterly journal published by Excellus Health Plan; *International Journal of Technology Assessment in Health Care*, a quarterly journal from Cambridge University Press; *Joint Commission Journal on Quality and Patient Safety*, published monthly by Joint Commission Resources; *Journal for Healthcare Quality*, the bimonthly journal for the National Healthcare Quality Association; *Journal of Health and Human Services Administration*, published by Southern Public Administration Foundation 4 times a year; *Journal of Health Care Finance*, a quarterly journal from Aspen Publishers; *Journal of Health Politics, Policy, and Law*, published 6 times a year by Duke University Press;

Journal of the American Medical Directors Association, a monthly publication from the American Medical Directors Association; *Medical Care*, published by Lippincott, Williams & Wilkins 12 times a year; *Medical Care Research and Review*, a bimonthly journal of Sage Publications; and *Milbank Quarterly*, published 4 times a year by the Milbank Memorial Fund and Blackwell Publishing.

Research Level Core

The Research Level Core list is important for comprehensive library collections, helping researchers and graduate students in a particular field. The 2006 Research Level Core list for Health Services Administration includes the following: *American Journal of Law & Medicine*, published 3 times a year by the American Society of Law, Medicine & Ethics; *American Journal of Medical Quality*, a bimonthly journal of Sage Publications; *Cost Effectiveness and Resource Allocation*, an online journal published by BioMed Central; *European Journal of Health Economics*, published by Springer-Verlag 4 times a year; *Evaluation and the Health Professions*, a quarterly journal from Sage Publications; *Evidence-Based Healthcare & Public Health*, a quarterly journal from Elsevier that is not indexed in PubMed; *Frontiers of Health Services Management*, published quarterly by the Health Administration Press; *Health Care Analysis*, published 4 times a year by Springer; *Health Economics*, a monthly journal from John Wiley & Sons; *Health Policy*, published by Elsevier 15 times a year; *Health Policy and Planning*, a bimonthly journal of Oxford University Press; *Health Research Policy and Systems*, an online journal published by BioMed Central; *International Journal for Quality in Health Care*, a bimonthly journal of Oxford University Press; *International Journal of Health Services*, published 4 times a year by Baywood Publishing Company; *Joint Commission: The Source*, a monthly publication from Joint Commission Resources that is not indexed for PubMed; *Journal of Ambulatory Care Management* and *Journal of Behavioral Health Services & Research*, each published quarterly by Lippincott, Williams & Wilkins; *Journal of Health Administration Education*, a publication of the Association

of University Programs in Health Administration; *Journal of Health Care for the Poor and Underserved*, a quarterly journal from Johns Hopkins University Press; *Journal of Health Economics*, published by Elsevier 6 times a year; *Journal of Health Law*, a publication of the American Health Lawyers Association; *Journal of Healthcare Information Management*, a quarterly journal of the Healthcare Information and Management Systems Society; *Journal of Healthcare Management*, published bimonthly by the Health Administration Press; *Journal of Healthcare Risk Management*, a publication of the American Hospital Association; *Journal of Law, Medicine & Ethics*, a quarterly journal of American Society of Law, Medicine & Ethics; *Journal of Legal Medicine*, published quarterly by Taylor & Francis; *Journal of Nursing Administration*, published 11 times a year by Lippincott, Williams & Wilkins; *Journal of Public Health Management and Practice*, a bimonthly publication of Lippincott, Williams & Wilkins; *Journal of Public Health Policy*, published quarterly by Palgrave Macmillan; *Managed Care Quarterly*, a publication of Aspen Publishers; *Medical Decision Making*, published 6 times a year by Sage Publications; *Mental Health Services Research*, a publication from Springer that is not indexed by PubMed; *PharmacoEconomics* published 12 times a year by Adis International; and *Value in Health*, a bimonthly journal published by Blackwell Publishing.

The Gray Literature and Others

Besides the Essential Core and the Research Level Core lists, the Core Public Health Journals Project also categorizes the gray literature, which includes newsletters, annual reports, and other publications that may be of interest to practitioners. For the subject of Health Services Administration, the 2006 list includes the following: *AHA (American Hospital Association) News Online*, *Environment of Care News*, *Healthcare Executive*, *Healthcare Financial Management*, *Hospitals and Health Networks*, *Joint Commission Benchmark*, *Joint Commission Perspectives on Patient Safety*, *Modern Healthcare*, and the state's and surrounding states' medical association journals.

Journal Citation Reports

The Institute for Scientific Information (ISI) produces the annual *Journal Citation Reports* to provide citation data on journals, as well as calculations of the journal's impact factor, immediacy index, cited half-life, citing half-life, and source data. These are quantitative methods for determining the relative importance of journals within subject categories. *JCR* is only available through a subscription. Most academic research libraries provide licensed access to this resource.

JCR is produced annually as two editions: the *JCR Science Edition*, which covers more than 5,900 journals on science and technology, and the *JCR Social Sciences Edition*, which covers another 1,700 journals in the social sciences. Health services research journals can be found in both editions. The *JCR Science Edition* covers the category Health Care Sciences and Services. This edition has journals that cover health services, hospital administration, healthcare management, healthcare financing, health policy and planning, health economics, health education, history of medicine, and palliative care. The *JCR Social Sciences Edition* covers the category Health Policy and Services. The journals listed in this edition include those that cover healthcare systems, including healthcare provision and management, financial analysis, healthcare ethics, health policy, and quality of care. Because the target audience of each edition is different, a health services administration journal may be listed in either with different data for impact factor, immediacy index, cited half-life, and citing half-life. When using either editions of the *JCR*, it is important to use the appropriate subject category and edition to review the data for a journal.

An often-cited measure of a journal's importance is its impact factor. Although *JCR* is a subscription-based resource, most publishers will list the journal's impact factor from their Web site. This measure refers to the frequency with which a typical article in a journal has been cited within a particular year or period of time. The impact factor, however, should not be the sole basis for judging the prestige of a journal. Information from the *JCR* is intended to complement information from other journal resources.

Health Services Literature Searches

Each year, more than 3,000 articles and reviews are published in more than 40 health services research journals. Additional health services research articles can be found in other health sciences journals, such as the *American Journal of Public Health*, the *Journal of the American Medical Association*, and the *New England Journal of Medicine*. Most of the journal literature is indexed within online databases produced by the U.S. National Library of Medicine (NLM). From 1994 to 2000, the NLM and the AHA jointly produced HealthSTAR (Health Services Technology, Administration, and Research), an online database focused on the clinical and non-clinical aspects of healthcare delivery. HealthSTAR contained citations and abstracts from the journal literature as well as monographs, technical reports, and other research materials from 1975 onward. Topics covered in HealthSTAR included evaluation of patient outcomes; effectiveness of procedures, programs, products, services, and processes; administration and planning of health facilities, services, and manpower; health insurance; health policy; health services research; health economics and financial management; laws and regulation; personnel administration; quality assurance; licensure; and accreditation.

Although the NLM no longer offers HealthSTAR as a separate database, the health services journal literature continues to be indexed and included in PubMed. PubMed provides free access to MEDLINE (Medical Literature Analysis and Retrieval System Online), NLM's premier biomedical database, containing more than 15 million journal citations. Most of the core health services research journals are included in PubMed, and the citations include links to the full-text versions of journal articles at participating publishers' Web sites.

Specialized PubMed search queries on healthcare quality and costs are available via the Pilot Health Services Research (HSR) Filters Project from the National Information Center on Health Services Research and Health Care Technology (NICHSR) Web site. These specialized PubMed queries can be used to identify journal citations that correspond to a specific health services research study category with a broad or narrow scope. The health services research study categories are appropriateness, process assessment, outcomes assessment, costs,

economics, and qualitative research. These specialized PubMed search queries were designed as tools to assist researchers, clinicians, health policy analysts, and planners. For comprehensive searches, researchers can use PubMed directly to further search the health services research journal literature.

Future Implications

Health services researchers rely on the scientific literature to make advances in the field. Several mechanisms and clearinghouses help make these peer-reviewed journals and other publications accessible and organized for the use of researchers and other health administration professionals. The databases, which are updated regularly, will continue to grow, capturing publications and information that will further health services research.

Helen Look

See also AcademyHealth; Healthcare Web Sites; Health Economics; Health Services Research, Definition; Medical Sociology; National Center for Health Statistics (NCHS); National Information Center on Health Services Research and Health Care Technology (NICHSR); Public Health

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National Information Center on Health Services
 Research and Health Care Technology (NICHSR):
<http://www.nlm.nih.gov/nichsr>
 PubMed (MEDLINE): <http://www.ncbi.nlm.nih.gov/pubmed>

HEALTH SURVEYS

Health surveys are one of the methods most commonly used in health services research for obtaining measures of various indicators of health knowledge, attitudes, behaviors, and demographic characteristics. They collect data by self-report, whereby participants (called *respondents*) reply to questions presented in a self-completion questionnaire or by an interviewer via telephone or face-to-face. Health services researchers conduct health surveys or use the findings from health surveys conducted by others (called *secondary analysis*) to perform needs assessments, develop cross-sectional profiles of populations, monitor populations or cohorts longitudinally, or collect pretest and/or posttest measures in studies using experimental or quasi-experimental designs.

Health surveys are an effective and efficient method for estimating the characteristics of large populations using data collected from representative samples, analyzing comparisons across various study units (most often, these are individuals, but they also can be groups such as households or organizations), and/or analyzing comparisons within study units over time. This is attributable to three key features.

First, most health surveys are conducted with large numbers (usually several hundred and sometimes thousands) of participants, who are selected using random (probability) sampling procedures. Random sampling avoids potential selection bias that might be present—for example, if participants were recruited by soliciting volunteers through advertising. Second, health surveys collect data in a structured, standardized manner from each respondent. This is accomplished by presenting each question to each respondent using the same mode of delivery, to the extent possible in a similar setting and under similar conditions, and using the same question wording, question order, and response choices. Third, almost all responses to health

survey questions are recorded in a quantitative format, such as counts of persons or events; numerical positions on rating scales; or by assigning numerical codes to nominal, categorical responses such as types of health insurance. This precoded response aspect facilitates data processing and analysis, especially when combining similar responses and comparing responses across and within respondents (in the case of a longitudinal design).

Advantages

There are numerous advantages or strengths of health surveys that make them useful for conducting health services research. The following points generally are characteristic of health surveys, but they do not necessarily apply to all health surveys.

First, as was already mentioned, health surveys, especially those conducted by U.S. federal governmental agencies such as the National Center for Health Statistics (NCHS) and Centers for Disease Control and Prevention (CDC), usually collect data from large, randomly selected samples. Random sampling avoids selection bias and enables health services researchers to apply inferential statistical procedures when estimating population characteristics (called *parameters*).

Second, the previously mentioned structured, standardized manner in which health surveys collect primarily quantitative data facilitates data collection, processing, and analysis. This also enhances the ability of health services researchers to replicate previous health surveys with different populations and/or to study the same populations or cohorts longitudinally.

Third, health surveys are a very flexible research method that can be used to collect data about various study units (e.g., individuals, households, organizations). They can be implemented in a wide variety of settings, ranging from a respondent's home to external sites such as schools, work sites, and health clinics. Finally, they can be used to study populations that are distributed broadly across large geographic areas, such as cities, counties, states, and countries.

Fourth, the self-report aspect of health surveys enables health services researchers to collect information about variables that are not observable directly. For example, most health surveys ask questions

about respondents' health knowledge and health attitudes/beliefs, which are not measurable reliably except by self-report. Health surveys also are often used to collect information about respondents' behaviors for which there are no records or the reliability of existing records is unacceptable, or in cases where it is difficult or not possible to gain access to records. Finally, when appropriate strategies are used, health surveys can be effective in collecting sensitive information. For example, anonymous strategies may be used to ask about attitudes, such as racial prejudice, that most respondents are reluctant to express publicly. Also, similar strategies may be used to ask about private behaviors, such as sexual practices, or about illegal behaviors, such as illegal use of drugs and other forms of substance abuse.

A final area of strength is that health surveys are efficient in terms of time and financial resources. They enable health services researchers to collect large data sets quickly and at relatively low cost per unit of information. Health surveys typically collect data from large numbers of respondents and measure large numbers of variables per respondent. Moreover, they do so much faster than is possible with most other data collection methods, especially for a study of the same size and design complexity. Although data collection time varies depending on the data collection mode, sample size, design complexity, and staff resources, the data collection phase for most relatively large health surveys ranges from about 4 to 12 weeks. Combined with the efficiency derived from using a structured, standardized data collection protocol in which almost all responses are precoded in a quantitative format, health surveys may collect and analyze large, complex sets of data in a very timely manner. This enables health services researchers to avoid or minimize potential historical influences that may threaten the interpretation of the data. It also enhances health services researchers' ability to be responsive to time-sensitive data applications, such as in making decisions about initiating, revising, or terminating health programs, or advocating health policies or legislation.

Cautions About Health Surveys

While they are efficient, the total financial resources required to conduct health surveys effectively,

especially large, complex ones, can be relatively high. Moreover, while they enable health services researchers to collect data quickly, all surveys require a substantial amount of time for planning and preparation. This time varies with the size and complexity of the survey, but it almost always is several times as much as is required for the survey data collection phase (also called the *field* phase).

Conducting any health survey effectively requires a well-trained, experienced, and supervised research team. It is feasible for small, simple surveys to be conducted by a small research team—for example, by an experienced survey researcher training and supervising staff, who are available within or through an organization that is sponsoring or collaborating on a survey. However, virtually all large, complex health surveys are conducted by health services researchers collaborating with experienced, professional academic or commercial survey research organizations.

Health Survey Data Collection Modes

Health survey data are collected by two basic strategies, whereby respondents are asked to reply to questions presented in self-completion questionnaires or read aloud by interviewers. There are several ways in which these strategies may be employed, either individually or in combination. Selecting the one most appropriate for a particular health survey requires considering several aspects regarding relative administrative feasibility and data quality.

Self-Completion Questionnaires

Self-completion (also called *self-administered*) questionnaires generally are the least expensive and easiest to implement survey data collection mode, placing the smallest demand on staff, equipment, and other resources. The most widely used application of self-completion questionnaires is in mailed surveys, whereby a questionnaire and a letter are sent via standard mail to a sample of persons whose names and addresses are available. The respondents are asked to complete the questionnaire and return it to the researchers using a postage-paid, preaddressed return envelope that is enclosed with the questionnaire.

Another common application of this strategy is for members or agents of the research team to distribute, in person, self-completion questionnaires to persons in the survey sample. The sample members are asked to complete the questionnaire and return it directly to the person from whom they received it, place it in a collection box, or send it to the researchers via standard mail, using a postage-paid, preaddressed return envelope that is provided along with the questionnaire. This strategy may be employed with individuals, such as samples consisting of clinic patients waiting to see health services providers, or with groups, such as samples consisting of students in classrooms or teams of workers at work sites.

Technological advances have led to the introduction of several computer-based strategies for conducting self-completion questionnaire health surveys. The most prevalent of these are e-mail surveys, Internet surveys, and computer-assisted self-interviews (CASIs), which is the most expensive of these strategies.

E-mail surveys are conducted by sending e-mail messages to samples of persons for whom e-mail addresses are available, such as college students or members of professional associations. They are asked to complete and return via e-mail a questionnaire that is attached to or embedded in the e-mail message or that may be downloaded from a Web site.

Internet surveys are conducted in two ways. One strategy is to send e-mail messages to the sample members (again, e-mail addresses must be available) inviting them to participate in the survey by visiting a Web site where a questionnaire may be completed online. The second strategy is to invite survey participation via pop-up windows presented to Web site visitors, for example—persons who visit Web sites for health information clearinghouses or health services providers.

CASIs are conducted by arranging for research team members to meet with respondents in person. Respondents are asked to complete a questionnaire that has been programmed into a laptop/notebook computer. The computers are provided by the research team members, who explain and monitor the respondents' use of the computer to complete the questionnaire using the keyboard to enter code numbers corresponding to their responses to the questions. Another form of this data collection

mode is audio computer-assisted self-interviews (A-CASI), whereby the respondents complete the questionnaire using a laptop/notebook computer supplemented by a synchronized recording of an interviewer reading aloud the instructions, the questions, and the response choices.

Interview Surveys

Health surveys use two basic strategies to collect data by conducting interviews. These are telephone interviews and face-to-face interviews (also called *personal interviews*). In both these modes, survey respondents are asked to reply to questions and response choices that are read aloud by interviewers. Telephone interviews are the most widely used mode for conducting survey interviews because of their versatility, data quality, and time and cost efficiency. While face-to-face interviews generally are the most expensive and time-consuming survey data collection mode, they are also generally considered to provide the best data quality among all survey modes. However, in most cases, this is not a substantial advantage over conducting interviews via telephone.

Prior to recent technological developments, most interview surveys were conducted by interviewers reading questions and response choices from paper copies of survey questionnaires and recording responses directly on the questionnaires. This paper-and-pencil-interview (PAPI) format is still used effectively for small-scale, low-budget interview surveys. However, technological advances have led to the widespread use of computer-assisted strategies for conducting interview surveys. Although there are many variations of these and new ones continue to be developed, the most prevalent strategies are very similar to the CASI described earlier. In fact, CASI strategies were derived from the interview technologies that were first developed for telephone interview surveys and then were applied to face-to-face interview surveys.

Computer-assisted telephone interviews (CATI) and computer-assisted personal interviews (CAPI—face-to-face interviews previously were called “personal” interviews, thus the *P* in *CAPI*) are conducted by interviewers reading aloud questions and response choices displayed on monitors by computers into which the survey questionnaire has been programmed. The interviewers use keyboards

to enter code numbers corresponding to the responses to the questions, which are stored directly into databases for processing and analysis. While various configurations of desktop or laptop/notebook computers may be used for CATI surveys, which usually are conducted at survey interviewing centers, CAPI interviewers are equipped with laptop/notebook computers for ease of portability in the field.

Telephone Interview Surveys

Telephone interview surveys are conducted by trained and supervised interviewers who call the persons in the sample on the telephone to interview them using the survey questionnaire as the interview guide. This requires that the sample members have current telephone access, and there must be a means for the researchers to obtain their telephone numbers. Although some members of the U.S. population do not live in households with telephone access, U.S. Census reports routinely indicate that more than 90% of the population have telephone access, providing the most thorough means of contacting of this large and geographically dispersed population at the least expense. One strategy for obtaining telephone numbers for sample members is to use appropriate existing lists, such as directories, for example, for employees of certain companies, or lists compiled from records, for example, for patients who have used services at certain health clinics during particular time periods.

A second strategy is to use one of several forms of specialized random sampling, referred to generally as random-digit dialing (RDD). This is employed when appropriate lists of telephone numbers for sample members are not available and, usually, the identity of the sample members is also not known to the researchers. For example, this describes the situation health services researchers confront when planning telephone interview surveys with random samples of all adults living in the United States. This strategy also is used for telephone interview surveys with samples of populations in smaller geographic units, such as cities, counties, and states.

Unfortunately, there are no master directories of telephone numbers for all U.S. households with telephone service that may be used as sampling

frames from which to select random samples. Even for smaller geographic units such as cities, many households with telephone service are not included in telephone directories because they have requested their numbers to be unpublished or unlisted. Also, new residents who have been assigned a telephone number since the publication of the most recent directories will not be included in them. These exclusions may result in unrepresentative samples due to substantial sample coverage bias and lead to errors in estimating population characteristics.

In its most comprehensive form, RDD would randomly select a set of all 10 digits constituting a telephone number (3-digit area code + 3-digit prefix code + 4-digit line code) to compose a sample of n telephone numbers to be called in conducting a survey. However, this procedure is never used because it is very inefficient in that most of the telephone numbers it generates will not be useful for the intended survey. Some numbers will not be in service, some will be assigned to businesses or institutions rather than to households, and some will be assigned to households located outside the city or other geographic area designated as the survey target.

In practice, alternative RDD strategies address these problems through multiple-stage sampling designs using information about groups of numbers that are known to be in service in the target population. These designs greatly improve efficiency by reducing the proportion of telephone numbers that will be called that are not in service or are not assigned to members of the survey target population. For example, the first stage might consist of selecting some or all the area code + prefix code combinations known to be in service in the target population. This information is combined with one of several alternative strategies for obtaining all or part of the 4-digit line code to create a sample of n telephone numbers to be called in conducting a survey. This is a simple illustration of an RDD sampling design. Several alternative RDD strategies are available, some of which are quite complex and require specialized expertise and resources.

For large-scale RDD telephone interview surveys, it is virtually essential for health services researchers to contract for the services of experienced survey professionals. RDD samples may be purchased directly from professional

sampling firms, usually via the Internet. However, most researchers will be served best by collaborating with experienced professional academic or commercial survey research organizations providing a full range of telephone interview survey services.

Face-to-Face Interview Surveys

Face-to-face interview surveys are conducted by trained and supervised interviewers who interview survey sample members in person, using the survey questionnaire as the interview guide. In most cases, these interviews are conducted in respondents' homes, but they also may be done at schools, clinics, work sites, and other appropriate locations.

In the most straightforward situation, face-to-face interviews are conducted in respondents' homes with a random sample selected from a list that includes the sample members' residential addresses. For example, the sample may be selected from a directory, such as one of employees, or from records, such as for health clinic patients.

Face-to-face interview surveys are very expensive in terms of time and money when the sample is selected from the general population, such as all adults residing in a large city. This is because, similar to the problem described regarding sampling for telephone interview surveys, no adequate list of names and addresses is available to serve as a sampling frame. The usual procedure for such surveys is to select a sample using a multistage cluster sampling design called *area probability sampling*.

This involves randomly selecting a series of increasingly smaller geographic units, then randomly selecting individual dwelling units, and then randomly selecting one eligible person within each dwelling unit. For example, for a survey of adult residents of a large city, the sampling design might first select a random sample of neighborhoods, then randomly select census tracts within those neighborhoods, and then randomly select city blocks within selected census tracts. At the block level, usual practice calls for sending research staff members into the field to develop on-site maps of the selected blocks and list the addresses of all dwelling units on those blocks. Then a random sample of dwelling units is selected using this information. Finally, interviewers are sent to the selected dwelling units to interview one person at

each unit. When more than one eligible person resides at a dwelling, the interviewer randomly selects one of them to interview. Virtually all surveys that involve this type of complex sampling design are conducted by health services researchers collaborating with experienced professional academic or commercial survey research organizations.

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See also Cohort Studies; Cross-Sectional Studies; Data Sources in Conducting Health Services Research; General Health Questionnaire; Health Indicators, Leading; Measurement in Health Services Research; Satisfaction Surveys; Short-Form Health Surveys (SF-36, -12, -8)

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- American Statistical Association, Survey Research Methods Section: <http://www.amstat.org/sections/srms>
- Behavioral Risk Factor Surveillance System: <http://www.cdc.gov/brfss/index.htm>
- Council of American Survey Research Organizations (CASRO): <http://www.casro.org>
- National Center for Health Statistics (NCHS): <http://www.cdc.gov/nchs>

HEALTH SYSTEMS AGENCIES (HSAs)

Health systems agencies (HSAs) were regional health-planning organizations. They were established under the authority and funding of the National Health Planning and Resource Development Act of 1974 (PL 93–641), which was signed into law by President Gerald R. Ford in January 1975. This act, repealed in 1986, created Title XV and Title XVI of the Public Health Service Act, which addressed health planning and resource development.

Background

Voluntary health-planning efforts began in the mid-1940s, involving community, business, and health provider leaders who were usually associated with community chests or the United Way. They conducted health planning, coordination, and studies in local communities using local funding.

During the Great Depression and World War II, there was very little hospital construction in the nation. Existing hospitals became obsolete, and more than 40% of the nation's counties had no hospitals at all. To address this problem, the U.S. Congress passed the Hospital Survey and Construction Act (PL 725) in 1946, better known as the Hill-Burton Act (named after the bill's sponsors Senators Lister Hill [D-AL] and Harold H. Burton [R-OH]). The act established a program that provided states with federal matching funds for the construction and modernization of health

facilities. The Hill-Burton program required states to develop medical facilities plans in order to guide the allocation of federal funds. The Hill-Burton program was amended in 1962 so that planning at the regional level could be supported using federal funds in selected areas of the country. HSAs continued the history of federally sponsored health planning at the regional level that began with the amendments to the Hill-Burton program and provided support for substate planning for medical facilities.

When the Social Security Act was amended in 1965 to include the Medicare and Medicaid programs, a concern emerged that the demand for medical services by elderly and poor populations might be overwhelming and that health planning was required. The Comprehensive Health Planning Act of 1966 (PL 89-749) was passed, which created state health-planning agencies, area-wide comprehensive health-planning agencies, funding for health planning education and consumer training, block grants to states, and funding for demonstration programs.

The areawide comprehensive health-planning agencies, known as “b” agencies because they were funded under section 314(b) of the act, were the predecessors of the HSAs. A system of about 200 regional comprehensive health planning organizations developed plans for health and, in many cases, assisted state governments in regulating capital investments by health facilities. These “b” agencies were required to have boards of directors with a consumer majority.

In 1972, amendments to the Social Security Act reflected a national concern over growing healthcare costs. These amendments included Section 1122, which placed limitations on federal participation in unnecessary capital expenditures by requiring, in the states where an agreement existed with the federal government, that a designated state-level health-planning agency review and approve proposed capital expenditures by health facilities. Failure to receive approval could result in reimbursement being excluded for depreciation and interest expense associated with the “unnecessary” capital investment under the federal Medicare, Medicaid, and Maternal and Child Health programs.

During this period, a few states initiated Certificate of Need (CON) programs through legislation or executive order that required approval

by the health-planning agencies or proposed capital expenditures or changes in services by health facilities. The programs were also called Determination of Need, or DON. These policy initiatives strengthened the area of health planning because state health-planning agencies, with the involvement of “b” agencies, engaged in CON, Section 1122 reviews, or both.

Under the Comprehensive Health Planning Program, there were no resources allocated to meet the needs identified in plans for health, and healthcare costs continued to increase at rates higher than the overall inflation. During the early 1970s, the hospital industry initiated the voluntary effort, or VE, to contain costs, but that effort failed.

Establishment and Role of HSAs

These historical factors set the stage for the passage of PL 93-641, the Health Planning Act. Title XV of the Public Health Service Act established state health-planning and development agencies (SHPDAs), statewide health coordinating councils (SHCCCs), HSAs, and centers for health planning (CHPs), for technical assistance and research.

Under this legislation, states were required to establish CON programs or risk losing federal funds. Each state also defined the geographic boundaries of health service areas; HSAs were established to conduct health planning and implementation activities for each health service area by developing health systems plans (HSPs) and annual implementation plans (AIPs). The federal government, as part of this policy, issued national guidelines for health planning for use by SHPDAs and HSAs. In addition, HSAs reviewed the proposed uses of federal funds in their health service areas, as well as the appropriateness of existing services.

Like the “b” agencies, HSA boards required a consumer majority. The consumers on the boards had to be representative of the socioeconomic, linguistic, and racial characteristics of the health service area.

Title XVI of the Public Health Service Act called for an area health development fund, requesting \$1.00 per capita as seed money toward implementation. However, this federal funding was not appropriated during the history of the National Health Planning Act.

Current Status

Federal support for health planning ended in 1986, just 11 years after the National Health Planning Act was enacted. At the time, under the Reagan administration, leaders examined health-care cost containment strategies, debating the effectiveness of government regulation versus that of free-market competition. The blend of health planning with regulation through the CON program made the implementation of health plans by HSAs difficult and fueled opposition to the program by health providers.

While HSAs are no longer funded, health planning at the local level, in some form, continues without federal support in most states. This planning is accomplished through the assessment and health-planning activities conducted by local public health departments and their partners.

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See also Access to Healthcare; American Health Planning Association (AHPA); Certificate of Need (CON); Health Planning; Hospitals; Public Policy; Rationing Healthcare; Regulation

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<http://www.planning.org>
- American Public Health Association (APHA):
<http://www.apha.org>

HEALTH WORKFORCE

Healthcare in the United States is delivered by a variety of providers. Some of these individuals hold licenses to practice within a discipline that is regulated by some state entity, while others are considered to be unlicensed support personnel. Collectively, those individuals who are healthcare professionals and those who work in healthcare facilities are referred to as the health workforce. The size and characteristics of the health workforce can be viewed from the perspective of both health professions and healthcare facilities. In 2006, 17.3 million individuals made up the health workforce, constituting 11.8% of the nation's total workforce, making it one of the largest employment sectors in the country.

The health workforce is diverse in terms of the educational preparation required for employment. Some jobs require only limited on-the-job training, some require college preparation at the associate and baccalaureate levels, others require postgraduate-level college preparation. Most professions that require licensure require at least a college degree at the associate degree level.

Health Professions and Occupations

The health professionals traditionally included in the health workforce are physicians, nurses, dentists, pharmacists, chiropractors, optometrists, podiatrists, physical therapists, occupational therapists, speech-language pathologists, and audiologists. Each of these professions requires practitioners to hold a license to practice. Some of the licenses are issued to cover practice in a single jurisdiction, usually a state; others may provide multistate licensure. Most require some form of national standardized pre-licensure examination.

The title "physician" is reserved for either doctors of allopathic medicine (MD) or doctors of osteopathy (DO). Both of these professions require formal postgraduate preparation beyond the baccalaureate degree and formalized professional practice or residency after licensure before independent practice is permitted. The area of practice selected will determine the number of years of residency training required.

Nurses represent the largest segment of the health professional workforce. Graduates of programs leading to the associate, baccalaureate, or entry master's degree may be eligible to take the licensing examination required to become registered nurses (RNs). Advanced education in nursing occurs at the master's and doctoral-degree levels. Advanced-practice licensure is available to nurse practitioners, nurse anesthetists, nurse midwives, and clinical nurse specialists in some states. Nurses holding advanced-practice licensure have an expanded scope of practice over that of RNs. The scope is defined in state statutes and through professional accreditation and certification bodies.

Dentists are educated primarily at the postbaccalaureate level, with 4 years of professional education leading to either the doctor of dental science (DDS) or the doctor of dental medicine (DMD) degree. The curricula for both degrees are essentially the same, preparing the practitioner to coordinate oral healthcare for patients. Both degrees are considered first professional degrees with postgraduate clinical specialization and advanced internships and fellowships available.

Pharmacists are trained to distribute drugs prescribed by physicians and other health practitioners and provide information to patients about medications and their use. The scope of practice for pharmacists is established at the state level and has been expanded in some states to include prescriptive authority and administration of immunizations. Education for pharmacy, once at the 5-year baccalaureate level, has moved to the 6-year doctoral level based on a 1989 decision by the American Council of Pharmaceutical Education (ACPE). As in medicine, the doctoral degree in pharmacy (PharmD) is an entry-into-practice degree. An internship is also generally required. Pharmacists holding licensure prior to the change in educational requirements remain eligible to practice within their discipline unless state law precludes it. Some, however, see the former baccalaureate-level-prepared pharmacists forced to return to school to remain competitive in the workforce.

Chiropractors, podiatrists, and optometrists are also educated with doctoral degrees that are considered first professional degrees. Doctors of chiropractic (DC) practice a drug-free, hands-on approach to healthcare that includes patient examination, diagnosis, and treatment. While the

baccalaureate degree is not a requirement for admission to schools of chiropractic medicine, the professional education is usually 4 years, with extensive clinical practice. Doctors of podiatric medicine (DPM) focus on care and management of conditions of the foot and ankle. Like the chiropractor, the podiatrist is educated in a 4-year first professional degree program, with extensive clinical work accompanying the education. Podiatrists may choose to complete additional postgraduate training in order to expand their medical and surgical skills. Doctors of optometry (OD) also engage in 4 years of professional education to receive the degree. Although many of the schools offering optometry do not require the baccalaureate degree as a condition of admission, it is important to know the regulation of the state licensing boards with practice jurisdiction. In some states, licensure is contingent on completion of not only the first professional degree but also the foundation education.

Physical therapists provide services that help restore function, improve mobility, relieve pain, and prevent or limit permanent physical disabilities of patients suffering from injuries or disease. They restore, maintain, and promote overall fitness and health. Physical therapy education has moved from the baccalaureate level to the graduate level in the past 15 years, with the last baccalaureate-level physical therapists graduating before 2002. Just as in 1999, when the decision was made to move physical therapy education to the graduate level, the professional association is now considering establishing the entry physical therapy degree as the professional doctorate. As of January 2007, 167 of the 210 programs offering physical therapy preparation were at the doctor of physical therapy level. This number has grown from 67 offering the practice doctorate in 2002.

Occupational therapists help people improve their ability to perform tasks in their daily living and working environments. They work with individuals who have conditions that are mentally, physically, developmentally, or emotionally disabling. They also help them develop, recover, or maintain daily living and work skills. As in physical therapy, occupational therapy education has moved from the baccalaureate level to a required graduate degree, with the last programs converting in 2005.

Speech-language pathologists, sometimes called speech therapists, assess, diagnose, treat, and help prevent speech, language, cognitive-communication, voice, swallowing, fluency, and other related disorders. They work with people who cannot produce speech sounds, or cannot produce them clearly; those with speech rhythm and fluency problems, such as stuttering; people with voice disorders, such as inappropriate pitch or harsh voice; those with problems understanding and producing language; those who wish to improve their communication skills by modifying an accent; and those with cognitive-communication impairments, such as attention, memory, and problem-solving disorders. They also work with people who have swallowing difficulties. In 2005, 47 states required speech-language pathologists to be licensed if they worked in a healthcare setting, and all states required a master's degree or equivalent.

Audiologists assist people who have hearing, balance, and related ear problems. They examine individuals of all ages and identify those with the symptoms of hearing loss and other auditory, balance, and related sensory and neural problems. They then assess the nature and extent of the problems and help the individuals manage them. The educational preparation for audiologists has moved from the master's degree to the clinical doctoral degree, and it is expected to become the new standard for licensure in the 49 states where audiology practice is regulated. Several states are currently in the process of changing their regulations to require the doctor of audiology (AuD) degree or its equivalent.

Allied Health Professions

Several fields constitute the allied health disciplines or professions. The types of occupations included under the allied health umbrella vary, but often include, dental hygienists, respiratory therapists, physician assistants, radiologic- and nuclear-medicine technologists and technicians, ultrasonographers, medical- and clinical-laboratory technicians and technologists, medical-records and health information technologists, medical-office assistants, emergency medical technicians and paramedics, and licensed practical nurses.

Dental hygienists remove soft and hard deposits from teeth, teach patients how to practice good oral

hygiene, and provide other preventive dental care. Although most education preparing dental hygienists is at the associate-degree level, some programs award certificates, associate degrees, and even master's degrees. Licensure is required to practice dental hygiene, and a dentist must supervise that practice.

Respiratory therapists evaluate, treat, and care for patients with breathing or other cardiopulmonary disorders. Practicing under the direction of a physician, respiratory therapists assume primary responsibility for all respiratory-care therapeutic treatments and diagnostic procedures. Most of this practice occurs in the hospital setting. Respiratory therapists complete at least an associate degree; however, most are required to hold a baccalaureate degree for practice as therapists.

Physician assistants (PA) emerged as a distinct health profession in the 1970s. As the name implies, these professionals work with physicians across all specialty areas and practice settings. PAs are formally trained to provide diagnostic, therapeutic, and preventive healthcare services, as delegated by a physician. Educational preparation for the role varies, but the professional training is usually at least 26 months in length.

Radiologic technologists and technicians take X rays and administer nonradioactive materials into patients' bloodstreams for diagnostic purposes. Some specialize in diagnostic imaging technologies, such as computerized tomography (CT) and magnetic resonance imaging (MRI). Graduation from an accredited program is generally required for licensure, although the length of education varies from certificate to degree.

Nuclear-medicine technologists administer radiopharmaceuticals to patients and then monitor the characteristics and functions of tissues or organs in which the drugs localize. Education for this field varies from 1 to 4 years, with preparation at the certificate, associate-degree, or baccalaureate-degree level. About 70% of the jobs in this field are in hospitals.

Diagnostic medical sonographers, also known as ultrasonographers, use special equipment to direct nonionizing, high-frequency sound waves into areas of the patient's body. Sonographers operate the equipment, which collects reflected echoes and forms an image that may be videotaped, transmitted, or photographed for interpretation and diagnosis by a physician. Training for this field is similar

in length to that required for radiologic-medicine technologists and nuclear-medicine technologists, although beginning in 2005, at least an associate degree was required to be registered. Unlike most of the other professions described, a license to practice is currently not required. More than 50% of those employed in the field work in hospitals.

Medical- and clinical-laboratory technologists and technicians perform complex chemical, biological, hematological, immunologic, microscopic, and bacteriological tests. The usual requirement for an entry-level position as a clinical-laboratory technologist is a bachelor's degree with a major in medical technology or in one of the life sciences. Registration and licensure are required in some but not all states.

Medical records and health information management professionals are responsible for the data storage, archiving, and retrieval of health information. Education for this occupation occurs at both the associate- and the baccalaureate-degree levels. As attention has been directed to the privacy concerns relating to electronic medical records and the federal Health Insurance Portability and Accountability Act (HIPAA), the complexity of health information management has increased.

Medical-office assistants perform administrative and clinical tasks to keep the offices of physicians, podiatrists, chiropractors, and other health practitioners running smoothly. The job responsibilities vary vastly based on the setting. Formal education, if required, is usually at the vocational and technical levels, requiring 1 to 2 years of training.

The specific responsibilities of emergency medical technicians (EMTs) and paramedics depend on their level of qualification and training. These health professionals provide field emergency assistance in incidents such as automobile accidents, heart attacks, drowning, childbirth, gunshot wounds, and disaster management, where immediate medical attention is required. EMTs have additional advanced training to perform more difficult prehospital medical procedures. Completion of a specialized training and certification process is required, and most states require that EMTs and paramedics get recertified every 2 years.

Licensed practical nurses (LPNs), or licensed vocational nurses (LVNs), care for the sick, injured, convalescent, and disabled under the direction of physicians and RNs. Although LPNs and LVNs

work under supervision, licensure is required in all 50 states and the District of Columbia. To obtain a license, an individual must graduate from an approved program and pass a standardized test (NCLEX-PN). Most educational programs are 1 to 2 years in length, some leading to a certificate of completion or diploma, and others leading to an associate degree.

Other Personnel

There are a variety of other support personnel included in the estimated 4.5 million individuals who are classified as part of the healthcare workforce because they work in healthcare settings. The list of categories of personnel classified as other support changes as new fields in healthcare are developed, new ways of delivering healthcare are created, and workforce specialization continues to develop. These other individuals include patient services support staff, such as nursing assistants, orderlies, and technicians; non-patient-care services, such as food services and janitorial/cleaning personnel; and administrative staff.

Healthcare Settings

Just as there is great variety and diversity in the healthcare professions and occupations, there also is great variety in the places where healthcare workers are employed. Although hospitals, including acute-care, psychiatric, and specialty facilities, employ the largest segment of the health workforce, there are other types of healthcare settings. These other types of facilities include nursing and personal-care facilities; home health care organizations, offices, and clinics; and medical and dental laboratories. More than 13 million members of the health workforce, or 8.9% of the overall workforce, work in designated healthcare facilities.

Hospitals collectively account for 41% of the total health workforce employed in healthcare settings in the nation. The second largest segment of employment is in nursing and personal-care facilities, where an additional 21% are employed. Offices of physicians, dentists, and other health professionals combined employ approximately 26%, with the remainder spread between ambulatory-care facilities, laboratories, and home health care.

The size of the health workforce in hospitals is one of the major reasons why attention is directed toward issues identified as effecting hospital care delivery. For example, as the largest employer of nurses, the reported vacancy rates and the length of time required to fill RN positions have driven workforce development initiatives to improve the supply of nurses. Strategies to increase the number of RNs as direct-care providers, including the use of patient simulation, have significantly influenced the education of nursing students.

There is significant regional variation in which type of healthcare entities employ the health workforce. For example, ambulatory-care settings, including offices, clinics, and similar facilities, employ significantly more of the health workforce in the western states and Florida, while hospitals are even larger employers in the northwest mountain states.

Other Employment Settings

The health workforce also comprises more than 4 million health professionals who work in settings that are not traditionally counted as healthcare facilities. Almost all health professionals working in these alternative settings hold professional degrees. In most cases, they also have licenses to practice within their discipline. Some of these settings include consulting firms, educational settings, insurance companies, pharmaceutical and equipment sales, and law firms. Some health professionals work in other settings where their educational preparation is not related to their role. As shortages in many professions grow, more attention is being directed to reengaging some of these workers in health services settings.

Linda F. Samson

See also Access to Healthcare; Complementary and Alternative Medicine; Licensing; Nurse Practitioners (NPs); Nurses; Pharmacy; Physician Assistants; Physicians

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HEALTHY PEOPLE 2010

Healthy People 2010 is the latest in a once-per-decade series of reports produced by the federal government to chart the state of America's health. The principal purpose and long-standing theme of *Healthy People* is to promote health and prevent illness, disability, and premature death. The extensive report is composed of 467 health objectives organized into 28 focus areas under 2 overarching goals: (1) increase quality and years of healthy life and (2) eliminate health disparities. While very comprehensive and seemingly daunting in scope, *Healthy People 2010* is intended to be used by a variety of public health, professional, and community audiences and is formatted into three parts, each providing a different focus and level of content detail. Available as a document, *Healthy People* is most accessible in an electronic format on the Internet.

Purpose

In its 25-plus-year history, *Healthy People* has served several interrelated purposes. First, it is a strategic plan for improving health presented

through a comprehensive array of related health objectives that set measurable targets for health improvement efforts by all levels of government as well as the private sector and community healthcare agencies. Most states and many localities, along with nongovernmental agencies, have adopted the Healthy People objectives in their own plans and programs or have used these objectives as the underlying rationale for their efforts.

Second, it is a compendium of summary health statistics on the leading causes of death, illness, and disability arrayed by race/ethnicity, age, and socioeconomic status, and for multiple time periods. *Healthy People* is one of the most frequently referenced data sources by health services researchers, policy analysts, planners, and health administrators in presenting baseline information on various health conditions.

Third, *Healthy People* establishes a framework for understanding the determinants of health placed within a broad systems context that recognizes that health is more than the presence or absence of medical care. The health of individuals and communities is determined by a variety of factors, including individual biology and behavior, the physical and social environment, broader policies and interventions that improve community health, along with access to quality healthcare services. *Healthy People* and this framework have been widely included in public health textbooks, graduate-level courses, and professional-education programs.

Fourth, *Healthy People* is a report card that can be used to gauge progress and establish performance standards and accountability for the vast American healthcare enterprise of public health and health services delivery. Its cradle-to-grave approach reports the state of the nation's health from infant mortality to the chronic conditions and causes of death most often associated with old age. At least two national reports issued by the federal government, one for 1990–2000 and the other after the year 2000, reported on progress of the nation in meeting the Healthy People objectives. Both reports scored the nation's efforts, noting both progress and deficiencies, and used the results to exhort policymakers in the public-health and medical-care arenas toward greater action. Myriad other reports have graded the effectiveness

of state, local, and private-sector efforts against Healthy People targets.

Finally, Healthy People establishes, as national policy, efforts that improve population health by increasing quality and years of healthy life and eliminating health disparities, the two goals of *Healthy People 2010*. Indeed, Healthy People is as close as the United States has ever come to a national policy on health.

Origins

The original, *Healthy People: The Surgeon General's Report on Health Promotion and Disease Prevention*, was released by U.S. Surgeon General Julius Richmond in 1979 to focus the nation on health promotion and illness prevention at a time when the federal government was increasingly concerned about the decade-long unabated rise in national healthcare spending. As the vast bulk of this spending was on medical care to treat illness and disability, it was believed that a greater emphasis on promoting health and preventing illness might slow the growth in healthcare costs. At the time, the United States was experimenting with national health planning as a way to better coordinate a fragmented and pluralistic healthcare system, which is composed of thousands of independent private and public healthcare providers, each determining individually what services would be provided to which populations or market areas. Unlike other industrialized countries, market forces are the primary organizing mechanism, with government, mainly involved at the state and local levels, playing little role beyond minimal regulation of quality, life safety, or professional standards. National health planning introduced a mechanism for coordinating health services at the local level, with strong guidance of these efforts from the states and by the federal government. National objectives for the availability of medical-care services had been set, and the state and local health-planning agencies were charged with using these standards to plan more effective and less expensive state and local healthcare systems.

Healthy People was an extension of these efforts, moving beyond goals for access to healthcare services to goals for reducing the illnesses and

health conditions underlying the need for these services. Taking a life-stage approach, *Healthy People 1979* set 15 specific goals and subgoals for reducing morbidity and mortality in five stages of life—infancy, childhood, adolescents/young adults, adults, and, finally, older adults. In addition to these specific targets, another 15 recommendations were offered, organized around preventive health services, health protection, and health promotion.

A National Health Improvement Plan

The 1979 Surgeon General's Report was more an agenda and a statement of national health policy than an implementable plan. And in 1980, a companion piece—*Promoting Health/Preventing Disease: Objectives for the Nation*—set forth 226 specific, measurable health objectives in a plan of action for reaching the Healthy People goals. These objectives, referred to as “the 1990 health objectives,” called for improvements in health status, risk reduction, public and professional awareness, health services and protective measures, along with surveillance and evaluation.

Development of the 1980 report involved consultations with and comments from more than 500 individuals and organizations from the private and governmental sectors. This highly participative development process was followed in the two subsequent versions of *Healthy People*, which involved as many groups as possible in the early stages, including comments from the public. This participatory process was formalized into the Healthy People Consortium as the organizational vehicle for the development of *Healthy People 2000* and the 2010 report.

Achievement of the 1990 Healthy People objectives was mixed, with success in areas such as hypertension, childhood infectious diseases, and injury prevention. Progress toward other objectives was slower, and new health challenges emerged. It was clear by middecade that an updated *Healthy People* for the year 2000 would be needed. This version expanded the scope of the effort to 339 objectives organized into 21 priority areas, including new areas such as cancer and HIV infection. The emphasis on prevention was increased, with inclusion of more screening to detect diseases before symptoms appeared. Specific

attention was also given to improving the health status of population groups demonstrating higher risk for a particular disease or condition. Feasibility of achievement was more explicitly taken into account in setting objective targets to make the objectives for the year 2000 more realistic, and a workbook was developed to facilitate implementation of the objectives at the state and local levels.

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See also Acute and Chronic Diseases; Disease; Health Planning; Morbidity; Mortality; Mortality, Major Causes in the United States; Public Health; Public Policy

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HOME HEALTH CARE

Home health care usually consists of formal, skilled healthcare provided by licensed professionals in a patient's home on the advice of a physician. Originally applicable to only posthospitalization patients, it now encompasses care for people of all ages at risk for institutionalization. The aim of home care is to enable the sick and the disabled to live independently with dignity in the comfort of their homes during recovery and rehabilitation, close to the support of family and friends. Home care is generally used for patients who have been discharged from the hospital and need skilled care and rehabilitation, older adults with functional limitations, children with special needs, people with severe physical or mental disabilities, veterans, and people with HIV/AIDS.

History

Home health care provided by non-family members emerged as an option in the United States during the early 20th century. Efforts to reduce costs and improve conditions for the acutely ill and newborn babies and their mothers were spearheaded by the Metropolitan Life Insurance Company in 1909. The Voluntary Nurses Association (VNA), now in existence for more than a century, provided home care to the sick. When a shortage of physicians stimulated the expansion of home-based nursing services during World War II, home care was transformed to its present form. The federal government became involved in home care following the Kerr-Mills recommendations to give aid to medically needy Americans 65 years of age or older; benefits were extended in 1965 to include disabled and dependent children. The 1988 *Duggan v. Bowen* court case expanded coverage criteria for home health

benefits. And a U.S. Supreme Court ruling in the 1999 *Olmstead v. LC* case, which determined that institutionalization should be the last resort for people with mental disabilities, has also increased the demand for home health care.

Types of Services Provided

Home health care covers a broad spectrum of diagnostic, therapeutic, and social support services. The medical component of home health care is advised by a physician and is usually administered by a physician assistant or nurse practitioner. It includes the professional services of a physician, nurse, dentist, podiatrist, rehabilitation specialist, psychologist, dietitian, optometrist, and social worker at home. In terms of Medicare, a single episode of home health care cannot exceed more than 60 days. While the number of subsequent episodes is unlimited, each has to be certified by the caring physician as required for reimbursement purposes. Skilled care in nursing, speech therapy, and physical/occupational therapy are provided by trained medical professional staff, who administer, monitor, and evaluate healthcare. Other services include medical-social services and assistance from a home health aide (reimbursable only when recommended for people receiving skilled care). The duties of the home health staff are to follow the physician's orders, adhere to prescribed routines, monitor general health and medications, teach informal caregivers and patients themselves to ensure continuity of care, and arrange all aspects of prescribed care. It is the responsibility of Medicare-certified agencies to keep the attending physician up-to-date on the patient's condition and requirements; other agencies are exempt from this requirement.

The services provided by home health care agencies can be broadly classified into five groups: (1) medical/skilled nursing, (2) equipment and/or medications, (3) personal-care services, (4) therapeutic services, and (5) psychosocial services. In 2004, about 75% of Medicare home health care patients received skilled nursing care, while less than 2.5% received physician care. Total personal care, composed of continuous home care, a companion, homemaker/household (including

meals-on-wheels) services, transportation, and respite care, is received by nearly 45%. Therapeutic-care services, in the form of dietary and nutritional services; physical, occupational, respiratory, or speech therapy; and other high-tech care, is received by nearly 37% of home health care patients. Nearly 13% were recipients of durable medical equipment (DME) and medications, and psychosocial services, consisting of counseling and psychological, social, or spiritual care, were provided to about 12% of total home care patients.

High-tech home health care is a growing component, constituting nearly 25% of total home care spending. It has allowed early discharge of seriously ill patients who need intermittent or continuous skilled nursing care, with hospices providing the bulk of care. Close coordination between physicians, nurses, pharmacists, equipment suppliers/technicians, home health care agencies, and family members provides 24-hour care and monitoring of patients, devices, and drugs. Perceived as more cost-effective than hospitalization, more health insurance companies and employer-based benefit plans have made high-tech home health care reimbursable.

Home Health Care Agencies

The federal Balance Budget Act of 1997 significantly curtailed Medicare reimbursements of home health care agencies, resulting in the closure of nearly one third of the nation's agencies, particularly in underserved and rural areas. Medicare's hospital prospective payment system (PPS), which was implemented in 1983, caused a shift of service provision away from VNAs and local health departments to the hospital and insurance sectors, which formed their own agencies and links to streamline posthospitalization care.

National statistics from 2004 show that 8,100 Medicare-certified home health care agencies provided care to nearly 2.4 million disabled and elderly people. The majority (57%) of these agencies were voluntary nonprofit organizations, 34% were for-profits, and the rest were government owned. About two thirds of them have affiliations with hospitals, corporations, or health maintenance organizations (HMOs). A disparate number

of agencies exist in rural areas, where just 21% of home health care agencies are located. In urban areas, the average length of service was 312 days, with a median of 76 days, while rates in rural areas were about 1.5 times higher. The maximum length of service was reported by for-profit agencies, with the shortest service by voluntary nonprofit agencies. Median lengths of service provided to those older or younger than 65 years of age were similar, though the average duration of care for women was 1.25 times longer than for men.

Staffs of home health care agencies are primarily composed of professional and vocational nurses (45%) and home health aides (39%), with the remainder consisting of physical, occupational, and speech therapists, and social workers.

Accreditation and Licensure

Accreditation is a voluntary process in which home health care agencies seek a "stamp of approval" from respected nonprofit organizations certifying that the agency meets national standards of care. Licensure and certification are issued by a government agency (federal or state) and are usually necessary to seek reimbursements for home health care. Licensure and certification requirements may vary by state. Often, licensure regulations are minimal and may not require an on-site survey. Different standards apply to agencies certified by Medicare and private agencies, with Medicare having more stringent standards requiring a larger investment.

Profile of Patients and Demand

The majority of individuals receiving home health care are elderly. At least 2 million individuals in the nation, half of whom are 65 years of age or older, are permanently homebound; millions more are temporarily homebound with illness or injury; and they all need home health care of some kind, whether intermittent, part-time or continuous, skilled or unskilled. The great increase in the aging and disabled populations due to increased longevity as a result of advances in medicine and technology will continue to fuel a demand for home health care in the years to come. According to the 2000 U.S. Census of Population, nearly two

thirds of the 1.3 million individuals receiving home health care were females. Detailed data from 2004 show that more than 1 million individuals receiving home health care were White, compared with 200,000 who were Black, Asian, Pacific Islander, or other racial group combined. Marital status influences the services used for home health care. Widowed individuals accounted for 35% of patients seeking the maximum Medicare benefit, while married people represented 32%. Only 18% of those who were single or never married were provided services, and the rest have unknown marital status. About two thirds of the individuals receiving home health care live with family members, less than a third live alone, while the remaining live with nonfamily members or have unknown living arrangements. More than 80% have a primary caregiver, typically a spouse or child/child-in-law. About 10% rely on paid help, and the remaining 5% rely on friends and neighbors or others.

Patients' Rights

Individuals who use home health care services from accredited Medicare and other agencies have certain patients' rights. They have a right to choose their own recognized agency, be treated with respect, appoint family or guardians to act on their behalf, receive a copy of their planned care itinerary, complain about inefficient services, and expect continuity of care. Home health care agencies are responsible for ensuring competency and continuity of care.

Costs, Funding, and Eligibility

The total national costs for home health care were nearly \$40 billion in 2000. Of the total costs, \$30 billion was spent on providing skilled and unskilled care, while the remaining \$10 billion accounted for expenditures on home respiratory (\$3.5 billion) or infusion therapy (\$4.5 billion) and DME. The total national costs of home health care are projected to be nearly \$60 billion by 2010.

Payments for home health care are covered by a variety of providers. The government pays for more than half the total national home health care costs. Medicare accounts for nearly 30% of

payments, while private insurance pays about 25%, and Medicaid and out-of-pocket payments each account for about 20%.

Medicare regulations require that a licensed physician, who also certifies the need for intermittent skilled-nursing and/or rehabilitation care, declare enrollees "homebound." Being homebound implies that leaving home requires a considerable effort; is usually performed only with supportive devices, special transportation, or another person; and occurs infrequently. To be eligible for Medicaid coverage, the individual must meet financial eligibility criteria and other parameters that differ significantly from state to state. Provision of long-term care services is mandatory in all states for individuals who are Medicaid eligible and qualify for institutional care. Similar criteria are in place for most private and public agencies that pay for home health care. Government insurance programs severely restrict the extent of home health care services, treating them as a complement to family care. Seeking reimbursable home care is generally a cumbersome, long-winded process.

Problems in Home Health Care

Home health care agencies are governed by their own rules and regulations. Personnel are usually available only on weekdays between 9 a.m. and 5 p.m., and there is no assurance that the same individuals offer treatment, to build patient confidence and ensure continuity of care. Rescheduling is not uncommon, which may disrupt family routines and clash with the schedule of other caregivers. Retention and lack of qualified staff, particularly nurses who provide the bulk of services, in this sector is a frequent problem. Delays in payment from government agencies are the norm, making it difficult for agencies to meet financial deadlines. Meeting the regulatory guidelines of Medicare and Medicaid, which are major suppliers of home health care, involves extensive paperwork and multiple billings. Quality assurance and accountability of noncertified agencies is nonexistent. Access to home health care agencies may be difficult, particularly outside urban areas. Medicaid recipients must often "spend down" to meet eligibility criteria. Disparities exist, with the uninsured and poor consuming fewer services. Overall, home

health care is labor intensive, and the out-of-pocket costs may not be sustainable for long even among the relatively affluent population.

Future Implications

Home health care is likely to increase in the future as people increasingly live longer but do not retain the ability to lead independent lives due to infirmities of normal aging coupled with disabilities due to chronic diseases. In an era where families are smaller, more nuclear, and living further apart, traditional family caregivers are becoming scarce. Currently, state and private agency support is inadequate to provide sustenance to all the needs of chronically disabled individuals. Home health care is an attractive alternative to institutionalization as it promotes independence, provides better quality of life, and is more cost-effective than prolonged hospitalization. Though Medicare and Medicaid strive to meet these needs, more must be done, such as health services researchers focusing on this aspect of providing equitable long-term healthcare.

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See also Access to Healthcare; Continuum of Care; Disability; Hospice; Long-Term Care; Medicaid; Medicare; Nurses

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<http://www.cdc.gov/nchs>

HOSPICE

Hospice is a philosophy as much as it is a concept. It is a fundamental belief in a peaceful and rational end of life directed by the person and not by healthcare or payment systems, or laws. Hospice, as a concept, is the treatment for pain and suffering, with the recognition and acceptance that cure is not possible. Multidisciplinary teams, often including volunteers, join patients, their families, and friends in creating a peaceful end-of-life experience. Medicare and Medicaid benefits are now available for hospice care, making it a more viable choice for many. In 2007, the number of Medicare- or Medicaid-approved hospice facilities in the nation totaled 3,078. These facilities provided services to more than 1.3 million individuals and their families.

History

In ancient times, “hospitium” was a concept that dictated that travelers, passing through, were given hospitality, including clothing and entertainment in private homes. Hosts and travelers knew each other or were part of a family known to the host. More public hospitality, perhaps between two cities rather than families, was seen in ancient Roman times. During the Middle Ages across Europe, travelers might find hospitium in hospitia, buildings attached to monasteries. Hospitia came to serve travelers making holy pilgrimages and the sick. Essentially, the hospitia were guesthouses offering shelter, food, and comfort for the weary. As in the past, the modern-day hospice provides care and comfort to the weary traveler. Only today, the journey is to the end of life.

Modern-day hospice began in England during the mid-1960s, when Dame Cicely Saunders, a physician, established St. Christopher's Hospice in London. It was a facility characterized by light, gardens, small groupings of patients, and areas for families to gather. The care received in this environment translated the philosophy into modern practice. Florence S. Wald, the dean of the Yale School of Nursing, opened the first hospice in the United States in Connecticut in 1974.

Definition

The word *hospice* originates from the Latin *hospitium*, meaning a guesthouse. This origin perpetuates the confusion that hospice is always a unique and specific place. While there are facilities that are either partially or entirely used for hospice care, the place is not the most important component. The essential components of hospice as a philosophy are the unwavering commitment to relief of pain and suffering when a person is diagnosed with a life-limiting disease, an unyielding belief in the irreducible wholeness of personhood that addresses the meaning of life and death, the quality of life and death, an understanding of spirituality, and a steadfast dedication to the right to make choices and decisions about one's own care at the end of life.

Hospice is not about suicide, euthanasia, or absence of care; nor is it about the prolonging of life or the quickening of death. It is about providing comfort and palliative care at the end of life, when the treatment of a disease is no longer appropriate or possible. Palliative care is defined as the relief of pain, suffering, and stress caused by illness and disease. Services are directed at both the individual and the family. The individual is assured that relief of pain and suffering are paramount in all endeavors. The family is comforted by the attention to the relief of the pain and suffering and supported through the grieving process that accompanies a rational and dignified end of life.

Hospice Philosophy and Services

The overarching goal of hospice is to ensure comfort and dignity to the dying individual and the

family as a unit. As a philosophy of care, it can be implemented in a variety of settings. Individuals can receive hospice services in their own homes, a nursing home or other residential facility, a hospital, or a freestanding hospice facility. Most recipients obtain care in their own home or in nursing homes. The care team consists of family, physician, registered nurse, patient-care assistant, chaplain, social worker, psychologist, dietitian, volunteer, and bereavement counselors for the loved ones.

An individual's family or friends may refer the individual to a hospice, but a physician must document the diagnosis and life expectancy of the individual. Persons with less than 6 months to live are eligible for hospice benefits through Medicare, and Medicaid in 43 states. Many private health insurers also offer hospice coverage. Hospice recipients, with physician input, may receive more than 6 months of hospice services when they live beyond the original life expectancy.

In terms of national statistics (2006), the average length of service in a hospice is 59 days, and the median length of service is 21 days. Most recipients obtain care in their own homes (47%) or in nursing homes (22%). Most of those in hospice have a cancer diagnosis (44%), followed by heart disease (12%) and those with dementia (10%). Other medical conditions include, but are not limited to, lung, liver, or kidney disease, HIV/AIDS, stroke, or motor neuron diseases. The majority (81%) of hospice recipients are Caucasians, followed by African Americans (8%), and Asians, Hawaiians, or Pacific Islanders (2%). Most hospice recipients are 65 years of age or older (81%). Specifically, 65- to 74-year-olds account for 17% of the total admissions, 75- to 84-year-olds for 31%, and 85-year-olds and older for 33%.

Components of Hospice

Prior to a hospice admission, a meeting occurs with the individual, the physician, the hospice representative, and the family (as appropriate). In this meeting, discussions about the diagnosis, goals of care, and types of support occur. Specifically, hospice focuses on the physical, psychosocial, and spiritual needs of its recipients. Emphasis is placed on the relief of symptoms (pain, shortness of breath, and muscle spasm), thereby promoting

comfort for the individual. The individual, as long as possible, directs the care provided; and when no longer able to direct this care, his or her wishes are followed until death occurs.

If individuals move into a facility wherein hospice, as a philosophy of care, is practiced, they are encouraged to create a home environment with their own furniture, linen, photographs, and music. Individuals determine their visitors and visiting hours and use their own clothing, and family or friends are encouraged to prepare food, especially the patient's favorite foods. The goal of creating a hospice facility is to make the environment like an individual's home while providing the expert care needed to alleviate pain and suffering.

After death occurs, hospice provides loved ones with bereavement counseling. This has a variety of forms, from personal telephone calls to letters, support groups, and individual counseling, to annual services that honor all who have died in a specific hospice.

The Hospice Association of America (HAA), an affiliate of the National Association for Home Care and Hospice (NAHC), developed a *Hospice Patient's Bill of Rights* that is based on dignity and respect for all recipients; the ability to make decisions regarding care, privacy, and confidentiality; knowledge of financial charges and payments; and the right to the highest quality of care. These rights are embraced widely by the nation's hospices.

Advanced Directives

As the hospice philosophy and practices gained acceptance, there emerged a need to have a resource to guide the family and caregivers when individuals were no longer able to speak for themselves or to make decisions. Thus, advanced directives were created. By definition, an advanced directive is a statement of what healthcare an individual wishes to receive or not receive when that person no longer possesses the capacity to make a healthcare decision and/or is not able personally to address the issue. In 1990, the U.S. Congress passed legislation that created the Patient Self Determination Act. This act mandates that healthcare providers and healthcare agencies ensure that patients have information and education about advanced directives. Furthermore, any agency that accepts federal funds (i.e., Medicare

and Medicaid) for care provided must abide by an individual's advanced directive. All 50 states recognize the legality of advanced directives. However, each state uses its own version, but all are essentially the same.

An advance directive is created before the need arises. A living will and a durable power of attorney (for healthcare, as separate from all other arenas) are two major components. Individuals create living wills to address the type and amount of healthcare to be provided at the end of life and/or when they cannot communicate their wishes, such as in a healthcare emergency. A durable power of attorney is another document that identifies the person who the patient authorizes to make decisions when he or she is unable, for example, to execute the terms of the living will. Each state has specific regulations and laws as to what a durable power of attorney can and cannot authorize with regard to an individual's healthcare, but the key is that a specific person is designated by the individual in advance of the need. The individual makes the decision to appoint the said individual freely and without any type of coercion. The person so designated speaks on the individual's behalf when he or she is no longer able to, advocates the plans the individual made and documented in the living will, and is the decision maker when healthcare consent is required.

While advanced directives are legal documents, there is no requirement that attorneys create them. There are no specific forms or formats required, although forms are readily available. An adult-age individual with decision-making capacity may create and/or change a living will at any time and designate a person who will have durable power of attorney in healthcare matters. In most states, the advance directives need to be witnessed by two parties. The signatures affirm that the person signing the living will is indeed whoever it states it is, that this person is of sound mind at the time of the signature, and that the documents are signed freely. Both the living will and the durable power of attorney documents should be shared with the individual's loved ones and healthcare providers so that they are available when the need arises.

Advance directives are the legal system's way of assisting an individual in determining the quality of life at the end of life. Like hospice, advance directives neither prolong life nor hasten death.

They provide healthcare providers with the treatment wishes of individuals at the end of life.

Future of Hospice

In an era of growing consumerism in the United States, individuals are increasingly educated about their bodies and their medical conditions. Most individuals want to be fully informed and actively involved in decisions about and for them. To many, quality of care is as important, if not more important, than the quantity of care. At the same time, pain and suffering are unacceptable, and all efforts must be made to alleviate them. Additionally, death and conversations about death and dying often are feared and delayed. Discussions typically occur only when faced with major decisions and in a highly emotional context.

Hospice as a philosophy encourages quality of life at the end of life. It promotes neither artificial prolongation of life nor artificial hastening of death. Hospice is about determination and choice, quality of life and not quantity, advocacy for self and others, relief of pain and suffering at the direction of the individual, and a rational and peaceful end to life as we currently know it.

E. Carol Polifroni and Lynn Allchin

See also Cost of Healthcare; Home Health Care; Long-Term Care; Medicaid; Medicare; Nursing Homes; Pain; Quality of Healthcare

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- National Hospice and Palliative Care Organization (NHPCO): <http://www.nhpco.org>

HOSPITAL CLOSURES

As the nation's healthcare system continues to evolve, the role and need for hospitals is changing. Sophisticated patient care technology is no longer the exclusive domain of hospitals. Some of the most advanced breakthrough technology does not require traditional healthcare settings. The pharmaceutical sector has grown, basing its economic justification on the ability to prevent hospital care. Physicians and a variety of commercial ventures have become competitors for the business of healthcare that once routinely went to hospitals. As a result of these changes, many hospitals may be at risk of closing in the future. Therefore, it is important for health services researchers to assess both the factors associated with hospital closures and the effect that those closures have on the community a hospital serves.

There have been several evaluations of the determinants associated with hospital closings. There is also some literature concerning the impact of hospital closings on other available institutional services, as well as the economic impact of hospital closings on the community. However, there is very little literature evaluating the specific health impacts of hospital closings on the populations remaining in their former service areas.

This entry begins by presenting recent hospital trends and defining hospital closure. Then, it discusses the roles of hospitals and the causes and implications of hospital closures.

National Hospital Trends

The number of community hospitals in the nation and their beds has steadily declined since 1975. In

1975, there were nearly 5,900 community hospitals with nearly 950,000 beds. In 2005, however, there were fewer than 5,000 community hospitals (a 15% drop) with about 800,000 beds (a 16% drop). Yet the number of patients admitted to the nation's community hospitals during this time period increased from 33.4 million in 1975 to 35.2 million in 2005 (a 5% increase). Despite the increase in the number of patients admitted during this same time period, there was a dramatic decline in the average length of inpatient hospital stays. In 1975, community hospitals accounted for more than 250 million inpatient days of care. In contrast, in 2005, the number had declined to fewer than 200 million days of care (a 25% drop).

At the national level, changes in technology and economics have altered the demand for inpatient hospital care, and hospital closings have not been as rapid as the changes in the marketplace. The resulting occupancy rate of community hospitals in the nation declined from an average of 75% in 1975 to 67.3% in 2005. While this brief view of national statistics would seem to alleviate concern that hospital closures are a troublesome phenomenon, the issue is, in reality, more complex. Local variations, in several metropolitan areas, have demonstrated the impact of hospital bed reductions on increasing bypass hours to trauma centers, loss of emergency service capacity, and the spreading instability of charity care that moves from closed hospitals to remaining neighboring hospitals.

Defining Hospital Closure

Hospital closure can be defined in two ways. It can be defined as the decommissioning of a physical facility that has routinely provided inpatient health services for a community. Such a hospital is simply no longer there. Hospital closure can also be defined as the elimination of all available beds in a facility that have been designated for the type of care the facility has routinely provided. Such a hospital building may still remain standing, but the services it provided no longer exist. For example, a community hospital may be replaced by a skilled-nursing facility or a behavioral-health facility. In either case, the elimination of hospital beds serving the original purpose has taken place. The

effect of each type of hospital closing is not entirely the same, and to understand the significance of the closure, one must recognize the various roles and the impact of a hospital on its community.

Hospital Roles

The effects of closures are best understood in relation to the hospital's role in the community. When a hospital closes, the community served by that hospital loses both a valuable community resource as well as an access point to the healthcare delivery system.

One important role of a hospital in the community is to serve as a point of access to healthcare. Hospitals vary significantly with respect to the specific types of care they provide. Thus, a community hospital may provide access to care ranging from acute emergency care to tertiary-level specialty care. Consequently, when a hospital closes, access to each type of care rendered by the facility no longer exists for that community. The community must therefore rely on accessing these needed services via another local hospital (if one is accessible), which may or may not provide an equitable level of access.

As a community resource, a hospital is also often an important source of employment for a community. In many communities, the hospital is the single largest employer. Consequently, the hospital plays an important role in the local economy by injecting money into the community. For example, a study of hospital closures in rural communities between 1990 and 2000 indicated that in communities for which there were no alternative hospitals, the closing of a hospital resulted in a 1.6% increase in the unemployment rate and a 4% decrease in per capita income.

Often, hospitals actively sponsor community outreach programs that, in effect, contribute to the overall wellness of the community. Such outreach initiatives may include health education, mobile prevention units, ambulance services, health fairs, screenings, and first-aid training sessions. A hospital closure, therefore, means the elimination of these community outreach services, which can be a significant loss to communities that depend on such services. Some hospitals, such as government or not-for-profit organizations, may have fiscal

obligations that lead them to provide charitable care for uninsured residents of their community. Such organizations often provide large amounts of uncompensated care for a community and draw additional funds from the state or federal government to pay for the cost of that care.

An often overlooked role of the hospital is that of player in the healthcare market affiliated with the community. Often, communities are served by more than one hospital, and the relationship between these facilities in terms of services rendered, payer mix, market share, and so on is extremely important to the viability of each facility. When a hospital closes, the healthcare market changes, and this change affects the business of other hospitals in the market. A study of the effect of rural hospital closures on neighboring hospitals examined this issue. It concluded that a rural hospital closure resulted in a statistically significant increase in patient volume for neighboring hospitals. However, this volume increase did not translate to predicted improvements in the profitability of the neighboring hospitals. Other studies of urban hospital closures have found that when a hospital closes, uninsured patients disproportionately shift to the nearest hospitals, endangering their survival.

Finally, hospitals are crystallizing forces, bringing healthcare resources into a community and focusing the activity of professionals on the needs of the community. When the hospital closes, the attention of those professionals dissipates, and the community residents lose their services.

Reasons for Hospital Closures

Most hospital closures are associated with circumstances in which a facility is no longer able to meet its financial obligations. However, it must be noted that not all financially stressed hospitals close. Studies have identified a number of other factors associated with hospital closures.

In assessing the research on factors associated with hospital closures, several recurring themes appear. One study of hospital closures in New York indicated that facilities that closed had significantly fewer hospital beds and lower occupancy rates than those facilities that remained open. This study asserted that small, low-occupancy hospitals tend to close because they

lack the diversity in services and the overall strategic planning resources necessary to survive an evolving market and because there is often less community opposition to closing these facilities than to closing larger hospitals. This study also indicated that the racial composition of a hospital's community was an important factor in assessing the potential for a hospital to close, especially for a voluntary hospital. Hospital closure rates were shown to increase significantly for communities with higher percentages of African American residents.

A study of urban hospital closures between 1980 and 1987 concluded that hospitals that invested in technology that will allow them to offer a variety of services either as a standalone facility or as a part of a multihospital system are less likely to experience closure. On the other hand, the study also concluded that hospitals located in communities with higher percentages of African American residents were significantly more likely to experience closure.

Other studies have examined the determinants of hospital closure as they related to mergers and acquisitions, and the effects of Medicare's prospective payment system (PPS). One study indicated that strategic and institutional variables such as diversification, occupancy rate, and for-profit status were critical determinants of hospital viability. The study also concluded that environmental factors such as per capita income, physician-to-population ratio, and hospital-bed-to-population ratio may also influence hospital viability.

Future Implications

While hospital closures have occurred as a result of changing technology and the economics of healthcare, the impact of the closures has not been studied in the context of the nonroutine roles that hospitals fulfill in their communities. At the national level, hospital closures seem to be consistent with changes in demand for hospital services, yet there are significant local anomalies that have resulted in displacements of vital emergency services and access to service for uninsured patients. More research is needed to address these and other issues.

Benn J. Greenspan

See also Access to Healthcare; For-Profit Versus Not-For-Profit Healthcare; Healthcare Markets; Health Insurance; Hospitals; Multihospital Healthcare Systems; Uncompensated Healthcare; Uninsured Individuals

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HOSPITAL EMERGENCY DEPARTMENTS

The nation's hospital emergency departments (EDs) provide critical care to those in need, day

and night, regardless of an individual's ability to pay for the care he or she receives. However, EDs are experiencing many problems, and they are said to be at breaking point. ED patient volumes are on the rise, and they are increasingly being used to evaluate and treat nonemergent conditions. This has led to EDs that are increasingly overcrowded and overwhelmed, often resulting in poor patient outcomes and struggles for sustainability. The challenges faced by hospital EDs need to be addressed as they are an essential means of healthcare delivery for many and an integral part of the nation's healthcare system.

Background

Hospital EDs, often colloquially referred to as emergency rooms (ERs), developed over the 20th century in response to the need to rapidly assess, stabilize, and treat critically ill patients. Recent data show that 10% of all ambulatory-medical-care visits now occur in EDs. Many patients are evaluated in EDs and discharged; however, EDs are also often used as a bridge to inpatient admissions.

Prior to the 1970s, hospital EDs were staffed primarily by internists, surgeons, and other physicians on a rotating-call schedule. With the increasing number of patients seen in EDs and the recognition of a need for skills to treat high-acuity patients, the specialty of emergency medicine (EM) was developed and officially established in 1979. The first emergency medicine residency training programs were started in the 1970s, and these programs have rapidly expanded, with 146 accredited programs as of 2008. With the development of the specialty, emergency-residency-trained and board-certified emergency medicine physicians are increasingly staffing hospital EDs.

Characteristics

Modern hospital EDs are open 24 hours a day and are attached to hospitals with inpatient facilities. In 2005, a national survey conducted by the National Center for Health Statistics (NCHS) found that most EDs (65%) were operated by voluntary nonprofit hospitals. Four of 10 were located in nonmetropolitan areas, and many were

in hospitals with fewer than 100 beds (57%). However, hospital EDs in metropolitan areas see 86% of all patient admissions, with two thirds of nonmetropolitan EDs seeing fewer than 30 patients per day and two thirds of metropolitan EDs seeing 50 to 200 patients per day. EDs in nonmetropolitan areas typically have 10 treatment spaces, while those in metropolitan areas have 10 to 50.

Hospital EDs see patients on a “walk-in” basis (patients who arrive independently) or by arrival via ambulance. In 2005, nearly 18 million patients (16%) arrived by ambulance, up 25% from 1997. Patients are triaged on arrival, which is usually a brief assessment by a nurse, after which patients are categorized according to their level of acuity. Triage criteria include vital-sign abnormalities or specific chief complaints (primary presenting symptoms) that identify the patients that might have more urgent needs, who are given priority for physician evaluation. In 2005, the leading chief complaints were abdominal pain, chest pain, fever, and cough, which accounted for 20% of all visits.

Higher utilization rates were seen in some population subgroups, which included infants, person 75 years of age or older, Medicaid recipients, Asians or Pacific Islanders, and African Americans. The highest per capita utilization rates were for persons living in nursing homes (147.2 per 100 individuals). Other high utilization rates were for infants under 12 months of age (91.3 visits per 100) and homeless persons (62.7 visits per 100).

Private insurance was the most frequent form of payment, accounting for 40% of visits. Medicaid or State Children’s Health Insurance Program (SCHIP) accounted for 25% and Medicare for 17%. No insurance represented another 17% of visits. Utilization rates were highest for Medicaid patients at 89.4 per 100 individuals, followed by Medicare (51.0 per 100 individuals), no insurance (45.9 per 100), and private insurance (23.8 per 100).

Hospital EDs are staffed by physicians and nurses and sometimes by technicians, emergency medical service (EMS) personnel, nurse practitioners, or physicians’ assistants. Most EDs (65%) use outside contracts to provide physicians. Physicians evaluate patients in the EDs, and those requiring admission are assigned to an on-call primary-care physician (family practice, internist, or pediatrician) or occasionally to specialty services such as cardiology, general surgery, or orthopedic

surgery. In 2005, about 12% of ER visits resulted in hospital admission. The average total length of stay for those admissions was 5.2 days, with the leading hospital discharge diagnosis being nonischemic heart disease. Most ERs have specialists on call for consultations, which may be over the telephone or require the specialist to come to the ED, depending on the circumstances.

A broad variety of diagnostic tests and tools are available at EDs. In 2005, diagnostic and screening services were provided for 71% of visits. Blood tests were performed for 38% of visits and imaging studies done for 44% of visits. Medical procedures were performed for 47% of visits, and medications were given or prescribed for 77% of visits.

Some hospital EDs have dedicated laboratory services; more often, laboratory tests for ED patients are conducted by hospital laboratory services but earmarked as “stat” and given priority over other inpatient or outpatient laboratory processing. Results from laboratory tests performed in the ED are generally expected to be available within 30 to 90 minutes in order to assist in the timely diagnosis, treatment, and disposition of ED patients. Most EDs have limited “bedside” testing, including urine pregnancy tests and urine dipstick testing (with results available in minutes); but many EDs are now incorporating some stat bedside blood tests to assist in treating severely ill patients and to improve efficiency.

Radiologic imaging is typically available in EDs. Plain radiographs (X rays) are routinely available, and most EDs have the use of hospital computed tomography (CT) scanners, with a growing number having dedicated ED CT scanners. Ultrasound services are often available for specific emergency conditions, and bedside ultrasounds performed by emergency medical physicians are becoming increasingly common.

Many hospital EDs have separate “urgent-care” or “fast-track” areas that are dedicated, usually only during the highest-patient-volume hours, to streamline the care of patients with simple low-acuity complaints. These are generally patients who require minimal diagnostic testing and can be rapidly assessed and treated. Typical complaints treated in these areas include cough and cold symptoms, rashes, lacerations, minor wounds, minor fractures, and abscesses.

Some hospital EDs have rooms designated as resuscitation areas, which have some space and specialized supplies and are reserved for the most severely ill patients. Some EDs also have areas specifically designed for particular types of patients, such as psychiatric patients or asthmatics. Additionally, there are pediatric areas in some EDs, as well as dedicated pediatric EDs, which are generally found in large urban areas and associated with pediatric hospitals.

Many hospital EDs double up as “trauma centers.” In certain institutions, trauma patients (individuals suffering from physical injury) are seen in an area separate from other ED patients. In 2005, hospitals designated as trauma centers saw 37% of visits. In 2002, there were 1,154 trauma centers in the nation. Trauma center designation varies on a state-by-state basis and is not uniform. Some states designate only Level I or Level II centers, while others use a four- or five-tiered system and designate every ED as a trauma center at some level. In general, trauma centers are ranked according to certain standards, including the availability of hospital intensive-care units, operating rooms, and surgeons and some specialists, including orthopedic surgeons and neurosurgeons.

Growth in Visits

The annual number of hospital ED visits in the nation has increased 20% from 1995 to 2005 (96.5 million to 115.3 million). This is equivalent to 219 visits every minute to the nation’s EDs, or an average of 30,000 visits annually per ED. While ED visits are on the rise, the number of hospital EDs has decreased over this same time period from 4,176 to 3,795 (a decline of 9%), which has caused the average number of visits per ED to increase by 31%. Moreover, from 2000 to 2006, there has been a 12% decrease in short-term acute-care beds, while the total area of EDs has increased 15%. These statistics all demonstrate how EDs are taking on an increasingly larger share of the healthcare burden, which has led to numerous problems.

While most of the increase in hospital ED visits is attributed to the growth in the nation’s population, more than one third is accounted for by the growth in per capita use over that time period. In

2005, one fifth of all Americans made one or more ED visits, making the ED utilization rate 39.6 visits per 100 individuals. EDs are increasingly being used by the uninsured, for their ease of access and convenient hours. Additionally, many patients are sent to EDs by their primary-care providers for tests or procedures that cannot be easily performed in outpatient office settings. While many outpatient physicians in the past would directly admit patients who required hospitalization, it is now commonplace in many hospitals to admit those patients via the ED for stabilization, facilitation of testing, or ease, or because of lack of beds for direct admission. In some rural areas of the nation as well as some inner-city areas, the ED may be the primary source of healthcare for a large percentage of residents. Also, EDs are increasingly being used for public health surveillance and for disaster preparation and response.

With the passage of the federal Emergency Medical Treatment and Active Labor Act (EMTALA) in 1986, all patients presenting at the ED are required to receive a medical-screening examination and subsequent stabilization of any emergency conditions found. The purpose of this law was to prevent patients with emergency conditions from being turned away based on their ability to pay for services. Ironically, EMTALA has been criticized as actually decreasing access to care by forcing the closure of many EDs and trauma centers and creating incentives for hospitals to tolerate long waiting times and divert ambulances to other hospitals while continuing to accept elective admissions.

Problems

The National Academy of Sciences, Institute of Medicine (IOM), published a series of reports in 2006 that identified key ED problems. They include the following: (a) many EDs and trauma centers are overcrowded, (b) emergency care is highly fragmented, (c) critical-care specialists are often unavailable to provide emergency and trauma care, (d) the emergency care system is ill prepared to handle a major disaster, and (e) EMS and EDs are not well equipped to handle pediatric care. This section discusses these and other problems that EDs face.

Overcrowding

During the past 20 years, more than 100 medical articles have been published addressing the issue of overcrowding in the nation's hospital EDs. National data from 2004 estimated that 40% to 50% of EDs overall experienced crowding, with two thirds of metropolitan EDs reporting crowding. Overcrowding is often estimated by surrogate markers such as boarding times, time spent on diversion, and left-without-being-seen (LWBS) numbers. "Boarding" patients are those who are ready for admission but are waiting in the ED for an inpatient bed to become available. Diversion is the practice of diverting ambulances that bring patients to particular hospitals to other, presumably less crowded hospitals. When a hospital is "on diversion," the ED still sees walk-in patients but is temporarily relieved of the burden of also receiving ambulance runs. LWBS patients are those who present to the ED but leave before being evaluated by a physician. In 2004, an estimated 2% of patients were LWBS. Most of these patients leave due to frustration with wait times, and a significant proportion of these have been found to be acutely ill and are subsequently admitted to the hospital.

The nation's hospital EDs report boarding 22% of patients, with 73% of them boarding two or more inpatients. Almost half of the EDs report boarding patients for an average of 8.9 hours for more than 4 days per week. Due to overcrowding, EDs have been forced to make creative use of space. Fifty-nine percent report routinely using halls for housing patients, 38% double patients in rooms, and 47% use nonclinical space for patient care. With overcrowding, nurses and physicians are burdened with taking care of more patients, with an average of 4.2 patients per nurse and 9.7 patients per physician.

In 2003, there were more than half a million diversions, an average of one per minute. A 2004 survey reports that approximately one third of U.S. hospitals reported going on ambulance diversion sometime in the previous year, and 12% of hospitals in metropolitan areas reported having spent between 5% and 19% of their operating time in diversion status. Diversions can create problems by increasing ambulance transit times and disrupting patterns of care (forcing patients to

be seen at different hospitals from where their physicians and records are located).

More overcrowding has been found in hospitals in areas with larger populations, higher population growth, or higher percentages of people without health insurance coverage. The factor most commonly associated with overcrowding is ED boarding. In particular, hospitals with this problem cite difficulty in moving patients to critical care or telemetry-monitored beds. The reasons given by hospital administrators for not having enough inpatient beds are primarily economic. It is more profitable to staff only a sufficient number of beds that are likely to be occupied (which can limit the capacity to staff up for occasional spikes in admissions), and there is competition for available beds among scheduled admissions, such as surgery patients (who are generally considered more profitable than ER admissions).

Overcrowding leads to long wait times, decreased physician productivity, poor patient satisfaction, poor outcomes for patients, lengthened ambulance runs, and lessened ability of hospitals to respond to public health emergencies. In 2005, patients spent an average of 56.3 minutes waiting to see a physician and 3.3 hours for the full duration of the ED visit. Steps to address overcrowding include increasing capacity (often increasing the number of ED beds, using observation units, or adding personnel) and improving efficiency. However, these are generally methods of managing crowding problems rather than reducing them.

Emergency Medical Services

Hospital EDs are often used in conjunction with EMS. EMS are prehospital services usually provided by paramedics; emergency medical technicians (EMTs); or sometimes firemen, who provide on-site treatment of patients and transport them with ambulances to EDs. EMS vary greatly; within a community, many services may exist with some volunteer, some paid, some based in fire departments, and some operated by hospitals or other private companies. Additionally, in some geographic regions, services are divided into basic life support (BLS) or advanced life support (ALS), which differ in skill levels of providers and available supplies. Due to the great variation in EMS, the national IOM has identified fragmentation of

services as a problem. It cites poor communication between EMS workers and police and fire departments as well as between EMS and EDs. The IOM also notes a lack of uniformity in 911 agencies and lack of standards and certification for training EMS personnel.

Primary-Care Burden

Hospital ED have increasingly been used for non-urgent conditions. An estimated one third to one half of all ED visits are for nonurgent conditions that probably could have been seen in a primary-care outpatient setting. Several reasons have been postulated for this trend, including ease of access, lack of health insurance coverage, and erroneous patient perceptions of “urgent” and “emergent” conditions. One study showed that of patients with nonurgent conditions who presented to the ED, 27% reported that they used it for all their medical care, 66% reported that they didn’t know where else to go for their current problem, and almost half rated the ED better for unscheduled care. Approximately one third of ED have been classified as high-safety-net-burden providers (seeing many uninsured or underinsured patients), with hospitals located in the South more likely (61%) to have this designation. High-burden EDs see a higher percentage of nonurgent cases that are primary-care treatable.

Lack of On-Call Specialists

Many specialty physicians do not want to be on call for EDs because of the difficulty in getting reimbursed for services with many uninsured patients presenting to EDs. Also, many specialists perceive additional liability risks for working with ED patients, who may need high-risk procedures and with whom they don’t have an established relationship. Insurance premiums can be higher for specialists who offer on-call services to ED. Being on call can be disruptive to the specialists’ personal lives, and providing night and weekend services in addition to regular practice hours can be physically demanding. Due to these constraints, many EDs report a lack of on-call specialists, which could delay treatment of emergent conditions, some of which could be life threatening. Of all on-call specialists, the services of plastic and hand

surgeons have been most frequently reported as somewhat difficult to obtain (49%).

Pediatric Care

Children make up 27% of all ED visits, but only 6% of the nation’s ED have all the necessary supplies for pediatric emergency care. Deficiencies have also been noted in prehospital equipment and in EMS training for pediatric patients. Improved pediatric preparedness is found in hospitals with inpatient pediatric services, with higher pediatric volume, with teaching-hospital status, located in particular geographic regions, and with higher per capita income in the community.

Lack of Language Translation Services

Non-English-speaking patients face significant barriers to care when translation services are not available. Miscommunications can lead to misdiagnoses and can impair a patient’s ability to understand his or her medical condition, follow up as directed, and comply with recommended treatment. One study found that only 52% of non-English-speaking patients were satisfied with their ED care compared with 71% of English-speaking patients. Many EDs don’t have translation services available or don’t have services provided in a timely manner. Often, family members (especially children) are relied on to translate, which can lead to problems of inaccuracy, conflicts of interest, or compromised patient confidentiality.

Finances

Since hospital EDs are required to provide sophisticated services at all hours, operation costs are high. Services are not designed for nonurgent care, and increased use for these purposes creates unnecessary costs. Additionally, increased use of EDs by underinsured patients who cannot pay their bills leads to increased uncompensated care. The American Hospital Association (AHA) calculated that the cost for uncompensated care was \$26.9 billion for all community hospitals in 2004. Many measures that are being instituted to address ED overcrowding simply expand the EDs’ capacities to deal with higher volumes of patients but do little to curtail the inappropriate use of EDs.

Possible Solutions

The national IOM has outlined several key recommendations to improve EDs based on its recent studies. They include the following: (a) create coordinated, regionalized, and accountable prehospital trauma and emergency care systems; (b) create a lead agency (based at the Department of Health and Human Services [HHS]); (c) end ED boarding and diversion; (d) increase funding for emergency care; (e) enhance emergency care research; (f) promote EMS workforce standards; and (g) enhance pediatric presence throughout emergency care.

To improve ED efficiency and enhance patient flow in order to reduce overcrowding problems, it is recommended that hospitals adopt operations management techniques. Notably, the Centers for Medicare and Medicaid Services (CMS) and the Joint Commission need to institute standards that support moving patients to inpatient beds more quickly and discouraging boarding.

In response to the recent national IOM reports, an Academic Emergency Medicine Panel highlighted areas warranting attention at academic medical centers. These include (a) strengthening the education environment in academic EDs, (b) recognizing the importance of emergency medicine residency training and emergency medicine subspecialty development, (c) using educational loan forgiveness to encourage rural emergency medicine practice, and (d) addressing ED crowding and its adverse effects on quality of care and patient safety.

Stacey Chamberlain

See also Academic Medical Centers; Access to Healthcare; Emergency Medical Services (EMS); Emergency Medical Treatment and Active Labor Act (EMTALA); Hospitals; Inner-City Healthcare; Patient Dumping; Primary Care

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HOSPITALISTS

Hospitalists are physicians whose primary professional focus is the general medical care of hospitalized patients and who provide continuity of hospital care from admission to discharge, often seeing patients in the emergency room and organizing post-acute care. The term *hospitalists* was first coined in 1996. The recent American hospitalist movement continues to grow at a rapid pace.

Background

Hospital-based physicians in Europe and a small number of integrated health delivery systems in the United States, such as Kaiser Permanente, preceded the more general introduction of hospitals to manage inpatient care across the nation. Traditionally, primary-care physicians supervise

inpatient care. Recently, however, some primary-care physicians have begun to delegate the responsibility to a hospitalist, thus converging to European practice, where the general practitioner in the community refers the patient to a consultant for inpatient care.

Hospitalists were first introduced in the mid-1990s, and by 2005, survey data from the American Hospital Association (AHA) reported 16,000 hospitals in the nation. The association's survey indicates that 40% of short-term community hospitals have hospitalists on the staff. The Society of Hospital Medicine (SHM), the professional society for hospitals in the United States, estimates that in 2007 there were 20,000 hospitals in the nation. Most hospitalists are trained internists, family practitioners, and pediatricians.

The AHA survey also showed that larger hospitals were more likely to use hospitalists than smaller hospitals. General hospitals were more likely than specialty hospitals, and hospitals with at least 20 residents and those affiliated with a medical school were more than twice as likely as hospitals with less than 20 residents and those not affiliated with a medical school. Federal government and private nonprofit hospitals were more likely than local government and private for-profit hospitals to use hospitalists. Hospitalists tended to work in hospitals that also made available advanced diagnostic and therapeutic medical devices. Hospitals in urban and wealthier counties were more likely to use hospitalists. Hospitalist use was more prevalent in counties with higher managed-care penetration and greater competition among health maintenance organizations (HMOs). A higher average physician age, an older patient population, and a greater share of primary-care physicians in the county where the hospital was located were all associated with lower adoption rates.

Duties of Hospitalists

The emergence of hospital medicine as a new medical specialty adds a new dimension to the ongoing specialization process in healthcare along the geographic and institutional dimension, namely the site of care provision. Whereas existing medical specialties are largely defined by disease, organ system, patient age, or patient gender, hospitalists are

defined by the setting where they provide care—the hospital. In this sense, hospitalists are akin to intensivists, whose focus of specialization is the intensive-care unit of hospitals. Hospitalists, typically trained as generalists, can be contrasted with the growing number of ever more narrowly defined specialists working within the hospital whose services can no longer be coordinated *ad hoc*.

Although hospitalists enhance coordination of care within the hospital, some believe that they do so at the cost of potentially worsening coordination between the referring physician's office and the hospital. For this reason, hospitalists can be viewed as offering different advantages to physician groups and to hospitals that are comparing the likely benefits and costs of employing hospitalists directly.

Hospitals' Motives to Use Hospitalists

In response to the growing regulatory scrutiny and advances in medicine, coupled with the increasing pressures of prospective payment adjustments and the exhaustion of cost savings through conventional utilization management, many hospitals have been turning to hospitalists to cope with these operational challenges.

As they work exclusively in the hospital, hospitalists specialize in coordinating the care of hospitalized patients and thus are often efficient in managing throughput. By closely monitoring patients and managing the flow of information, hospitalists minimize the unproductive intervals between successive treatment stages, reduce the incidence of hospital-borne pathologies, help in the formulation of and compliance with clinical practice guidelines, and prevent unnecessary use of diagnostic tests and therapeutic procedures, thereby limiting utilization of hospital resources and minimizing the length of stay without compromising patient safety or treatment quality. Hospitalists aid in streamlining the administrative processes that govern hospital-based patient care and mediate between specialist physicians and staff. Given their constant presence in the hospital, their familiarity with the hospital's resources, and their greater social distance from the patient compared with the patient's primary-care physician, hospitalists are well positioned to manage

the utilization of expensive technologies and procedures. In this sense, hospitalists represent a new generation of utilization management.

In addition, hospitalists are often tasked with managing unassigned patients, who are frequently admitted through the hospital's emergency department and whose care is not assigned to a specific physician prior to admission. In academic medical centers, hospitalists are also charged with teaching duties.

Primary-Care Physicians' Motives to Use Hospitalists

The infrequency and the higher severity of the typical hospitalization have lowered the attractiveness of hospital work for office-based physicians. By delegating the hospital-based portion of care of their patients to hospitalists, office-based primary-care physicians can spend more time on office visits, need not invest in the knowledge and skills specific to hospital-based medical care, and can save commuting time between the office and hospitals. As the frequency of patient referrals by office-based primary-care physicians to hospitals has decreased, and as the sophistication of hospital-based care has increased, more and more primary-care physicians are finding it beneficial to use hospitalists.

Primary-care physicians who serve older patient populations may be worried about the potential discontinuity of care that the introduction of hospitalists creates at the point of the patient's transfer from the referring physician to the hospital. This handoff may lead to a loss of patient-specific information, such as comorbidities, medical histories, and treatment preferences, whose importance typically increases with patient age. This discontinuity presents a major challenge to the hospitalist model.

The similar per-episode reimbursement rate for hospital-based and office-based care for primary-care physicians seems to play a role in reducing the reluctance of some physicians to delegate the hospital-based portion of care to hospitalists. More in-depth specialization along the healthcare continuum is also hampered by the prohibition and prosecution of kickbacks and fee-splitting practices.

Employment Models

With regard to the employment model for hospitalists, in 2003, hospitals using hospitalists employed by a hospital or university constituted the largest group, followed by hospitals whose hospitalists were employed by a hospitalist-only group and those whose hospitalists were employed by a physician group. If hospitalists were uniformly engaged in a specific set of tasks, economic theory would predict, all other things being equal, that the healthcare system would converge to a single, cost-minimizing employment model. In this light, the diversity of employment models is puzzling to health services researchers and suggests that variation in the local characteristics of the market for physician services may play a large role. The choice of employment model affects the extent to which the efficiency gains promised by proponents of hospitalist use are realized and shared by the parties involved.

Apart from teaching duties for hospitalists who are employed by teaching hospitals, they are engaged in the same tasks across all employment models. By employing hospitalists directly, hospitals can potentially reward hospitalists for the cost savings, outcome improvements, and patient satisfaction ratings that they may achieve and thereby align the hospitalists' objectives with those of the hospital. This alignment may be particularly important when the hospital chooses to manage costly medical technologies, whose use can be monitored and controlled by hospitalists.

Insofar as hospitalists are charged with managing unassigned patients, who are disproportionately uninsured and therefore do not constitute a source of separate reimbursement for hospitalists, direct employment by the hospital may provide both parties with a convenient solution to the management of unassigned patients.

Some primary-care physicians may prefer to contract with independent provider groups and physician groups if they give them better control over the hospitalists' priorities in treating the referring group members' hospitalized patients. Compared with direct employment by the hospital, this arrangement may mitigate the possible loss of knowledge about the patient's medical history and treatment preferences, which might be particularly serious for older patients.

In addition to primary-care groups and hospitals, hospitalists may choose to organize themselves as freestanding practice groups. Hospitalist-only groups are free to serve multiple primary-care physician groups, as well as multiple hospitals, and therefore may be in a position to diversify across different patient groups that are associated with individual primary-care physician groups and hospitals.

Which employment model prevails in the long term will depend on the number of physicians prepared to work as hospitalists relative to the demand for them. If demand outpaces the supply, hospitalists will likely choose to organize in the form that allows them to capture most of the gains and addresses their personal needs best.

Fraud and abuse laws, as well as ethical considerations and increasing scrutiny, make it difficult to share any potential gains from using hospitalists, unless the party employs them directly. By developing vertically integrated working structures, in which physicians are salaried by the hospital, the incentives of physicians and hospitals are more closely aligned. As bona fide employment relationships are one salient exception to the anti-kickback statute, vertical integration allows hospitals to control costs by supervising physicians through utilization management techniques, clinical practice guidelines, and other care protocols.

Future Implications

The use of hospitalists has emerged partly in response to regulatory pressure, such as the switch to a prospective payment system and the passage of the federal Balanced Budget Act of 1997. In particular, the widely adopted practice of payment per Diagnosis Related Group (DRG) has encouraged hospitals to find new ways to cut the length of stay without jeopardizing quality of care. While the role of hospitalists in reducing average length of stay seems well established, it remains debatable whether this effect was a by-product of or the principal reason for their emerging prominence. It is also not clear whether hospitals will be able to continue to appropriate the efficiency gains from lower hospitalization stays in the long run. The new type of practical knowledge and evidence-based medicine that hospitalists have been helping to develop and propagate will eventually lead to a

new yardstick for payers, who will likely internalize the new standards and lower their effective payments accordingly. As a result, more pressure may be put on hospitalists to come up with even better ways to decrease length of stay further. Another driver of the hospitalist movement is the pay-for-performance model of reimbursement. A growing number of hospitalist programs have quality-based incentives, often matching the pay-for-performance targets of the hospital.

The future course of the diffusion of the hospitalist model is unclear. If the principal barrier to further diffusion of the hospitalist model is a lack of information among nonadopting hospitals, a continued process of learning will encourage more hospitals to adopt and thereby help contain cost further. While initially raising hospital profits, physician wages, or insurance profits, rate-setting entitlement programs may eventually reduce hospital reimbursement rates, which should then be passed on to consumers in the form of lower insurance premiums and taxes. On the other hand, if the principal barrier to further diffusion lies in the small size of benefits compared with the cost of adoption, additional diffusion will be minimal and the efficiency gains may have been already exhausted.

Lorens A. Helmchen and Guy David

See also American Hospital Association (AHA); American Medical Association (AMA); Fraud and Abuse; Hospital Emergency Departments; Hospitals; Physicians; Primary-Care Physicians; Quality of Healthcare

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HOSPITALS

Hospitals are the centerpiece of U.S. healthcare. Hospitals are multipurpose healthcare institutions. They provide a place for physicians and other clinicians to treat patients, for special diagnostic and treatment services, and for emergency care services. They are important resources in times of crises, for aggregating healthcare assets to benefit the community, and major sources of employment and other economic benefits. Hospitals also often serve as focal points for the coalescing of people's efforts to address the healthcare needs of communities.

Definitions

Hospitals are increasingly defined by the various organizations that license, regulate, and accredit them. As such, the technical definition of a hospital may vary widely across nations, states, and programs.

The World Health Organization (WHO), for example, broadly defines a hospital as an organization that is permanently staffed by at least one physician, can offer inpatient accommodations, and can provide active medical and nursing care.

The American Hospital Association (AHA) more narrowly defines a hospital as an organization that

(a) has at least six inpatient beds that are continuously available for care; (b) is constructed to ensure patient safety; (c) has an identifiable governing authority responsible for running it, a chief executive who reports to the authority, a medical staff with licensed physicians, and at least one registered nurse supervisor and continuous nursing services; (d) admits patients only by a member of the organization's medical staff; (e) maintains medical records; and (f) provides pharmacy services and patient food services, including special diets.

The National Center for Health Statistics (NCHS) defines a hospital, for the purpose of its surveys, as an organization with an average length of inpatient stay of less than 30 days (short stay) whose specialty is general (medical or surgical) services or that provides general medical care for children. NCHS excludes federal hospitals, hospital units of institutions, and hospitals with fewer than six beds staffed for patient use.

Classifications

Hospitals are classified in many ways, such as by their ownership, the services they provide, whether they are community hospitals, and whether they are members of a multihospital healthcare system.

In terms of ownership, hospitals are classified as being nongovernment not-for-profit institutions (i.e., church operated, or other), investor-owned (for profit) institutions, or government-owned institutions (i.e., federal, state, or local).

In terms of the services they provide, hospitals are classified as being general institutions (providing a wide array of patient services, diagnostic and therapeutic, for a variety of medical conditions), special institutions (providing services for patients with specific medical conditions), rehabilitation and chronic-disease institutions (providing services to handicapped or disabled individuals requiring restorative treatment), or psychiatric institutions (providing services for patients with psychiatric illnesses).

A very important distinction is whether an institution is a community hospital or not. The AHA defines community hospitals as all nonfederal, short-term (having an average length of inpatient stay of less than 30 days), general and other special hospitals (e.g., children's hospitals, obstetrics and

gynecology, rehabilitation hospitals) whose facilities and services are available to the public.

Hospitals can also be classified by whether they are members of a multihospital healthcare system (two or more hospitals owned, leased, sponsored, or contract managed by a central organization) or a single stand-alone institution.

Hospitals in the United States

In 2006, there were a total of 5,747 hospitals registered with the AHA in the United States. Of the total, the majority, 4,927, were community hospitals (85.7%). Most of the nation's community hospitals were nongovernment not-for-profit institutions (2,919 hospitals, or 59.2%), followed by state and local government institutions (1,119 hospitals, or 22.7%) and investor-owned institutions (889 hospitals, or 18.0%). Most community hospitals, 2,926 (59.4%), were located in urban areas, while 2,001 (40.6%) were in rural areas. And most community hospitals (2,755 or 55.9%) were members of a multihospital healthcare system.

In terms of noncommunity hospitals, there were 221 federal hospitals (e.g., Veterans Affairs, Public Health Service, and Department of Justice hospitals), 451 nonfederal psychiatric hospitals, 129 nonfederal long-term care hospitals, and 19 hospital units of institutions (e.g., prison hospitals and college infirmaries).

There were a total of 947,412 staffed hospital beds in the nation, with community hospitals accounting for 802,658 beds (84.7%). There were a total of 37,188,775 admissions to all hospitals, with 35,377,659 admissions to community hospitals (95.1%). The total expenses for all hospitals were \$607,355,354,000, with community hospitals accounting for \$551,835,328,000 (90.8%).

Licensure, Regulation, and Accreditation

Hospitals must meet the myriad standards created by various government regulatory bodies. Such standards include, among others, (a) state and local licensure requirements; (b) conditions of participation for federally funded payment programs (i.e., Medicare, Medicaid, and TRICARE, the Military Health System); (c) rules governing research, the use of controlled drugs, radiation safety, and patient

rights; (d) patient privacy guidelines; (e) state and federal tax-exempt requirements (for not-for-profit hospitals); and (f) federal and state rules regarding assured access to emergency medical care.

The most direct independent force in molding the structure of contemporary hospitals has been the Joint Commission. The Joint Commission sets standards through which almost all nongovernmental hospitals and many other healthcare organizations are measured to attain accreditation approval. This accreditation is not only a means of asserting a quality status to the public at large but also serves as the surrogate approval mechanism for many other regulatory agencies and other state and federal certification. Approval may also be the key to being accepted by payers such as Medicare, Medicaid, and Blue Cross. While the accreditation process is voluntary, and hospitals are required to pay for participation, the link to certification, licensure, and payment makes it all but mandatory. Its impact on the structure of hospital medical staff is, as a result, unavoidable.

History

Specially organized places where individuals sought relief from illness or injury, places to receive care in the process of dying, and places to go for birthing have existed in many forms for thousands of years. The ancient Greeks, Egyptians, and Romans established temples where rites were performed to cure the sick.

Perhaps the oldest highly organized institution specifically dedicated to the care of the sick was established in Mihintale, Sri Lanka, sometime around the 4th century BCE. Archeological evidence appears to show that the well-constructed hospital had a waiting room, a dispensary, examining rooms, residential rooms for patients, and a bath where patients would be immersed in medicinal herbal water or oil.

In Europe, hospitals were typically created by various religious orders. Hospitals were also established as hospices along the major pilgrimage routes. The name *hospital* comes from the Latin *hospes*, referring to either a visitor or the host who receives the visitor. From *hospes* came the Latin *hospitalia*, an apartment for strangers or guests, and the Medieval Latin *hospitale* and the Old

French *hospital*. In England, in the 15th century, the name shifted to mean a home for the elderly or infirm or a home for the down-and-out. *Hospital* only took on its modern meaning as an institution where the sick or injured are given medical or surgical care in the 16th century. Other terms related to hospital include *hospice*, *hospitality*, *hospitable*, *host*, *hostel*, and *hotel*.

In the New World, the Spanish conquistador Hernando Cortez built the first hospital in 1524 in Mexico City. The Hospital of the Immaculate Conception (which in 1663 became the Hospital of Jesus of Nazareth) is today the oldest continuously operating hospital in America. Throughout the Spanish settlement of America, various Catholic orders established a number of hospitals.

As other Europeans settled in what would become the United States, they also established hospitals. As the population of the new country expanded, more hospitals were created. Specifically, hospitals were established for a number of reasons. Religious orders created hospitals in response to local needs. Some communities created hospitals to expand their almshouses and prisons in order to house the insane, the poor, and others who did not have a home in which to receive care, whereas other communities created hospitals to contain patients who were contagious or who were in some other way undesirable. Physicians also created hospitals to have a place to support patient care. Some communities built hospitals as a place to support training of physicians and other professionals to meet their healthcare needs and/or as a place to support research and the development of new medical technology. In addition, individuals and corporations created hospitals as profit-making ventures to fill specific market niches.

Technology and the Modern Hospital

Today's modern hospital emerged in the latter half of the 19th century. Although a number of factors were responsible for its emergence, arguably, the two most important factors were the development of anesthesia and the germ theory of disease and antiseptic techniques.

While American surgeons had much of the knowledge needed to conduct major surgical procedures by the 19th century, because the

surgeons lacked anesthesia, they had to operate quickly, patients suffered great pain and torture, and postoperative infection rates were high and often deadly. It was not until the mid-19th century with the introduction of anesthesia, such as nitrous oxide, ether, and chloroform, making possible the systematic application of surgery, that the growth of hospital services began. As a result, surgeons became the professional leadership in the formalization of hospital organizations well into the 20th century.

In the mid-19th century, individuals such as Oliver Wendell Holmes, Ignatz Semmelweis, Louis Pasteur, Joseph Lister, Robert Koch, and others advanced the germ theory of disease and demonstrated effective measures that could reduce the rate of disease, methods of immunization, and ways to prevent the raging infectious disease death rates in hospitals. With the reduction of diseases such as puerperal fever, a deadly disease of women giving birth, the public no longer viewed the hospital as a place to die; instead, it was a place to be cured. New antiseptic techniques developed by Lister lowered the infection rates from surgery. Previously, almost all wounds became infected, and mortality rates from surgery were as high as 90%.

Today, technologic innovations and medical advances continue to take place in hospitals. For example, recent surgical innovations include minimally invasive surgery, various endoscopic procedures, and the use of surgical robots that allow delicate microprocedures to be performed. In addition, advances in physiology and the monitoring technology of anesthesia have extended surgical procedures to older and sicker patients. Interventional instruments such as the laparoscope and balloon catheters continue to radically change hospital care, while advances in the development of radiation therapy have expanded the treatment options for many diseases. New imaging instruments such as ultrasonography equipment, thermal imaging equipment, high-speed computerized tomography (CT) scanners, magnetic resonance imaging (MRI) equipment, and positron emission tomography (PET) scanners are opening a new world of early and noninvasive diagnostic techniques.

The Hospital Medical Staff

As hospitals evolved through the 19th century, the role of physicians remained as that of independent caregivers and entrepreneurs. Their relationship with the hospitals of their time was as individuals and, for the most part, was neither organizational nor economic. The concept of mutual benefit had mostly to do with the perceived need for a place to keep those patients who could not be treated at home. The physicians performed surgery and attended to their patients, but there was little demonstration of an organized role in the governance or oversight of medical care as a whole.

However, it was in this period that the functional and economic basis for cooperation among physicians grew. Acceptance by a group of colleagues, willingness by those colleagues to refer patients to the member for service, and willingness to see a colleague's patients when he or she was not available were all valuable resources for a physician. As these benefits became more important, the notion of limiting who could join the medical staff of the hospital and share its benefits became more important. Being selective about who may join the hospital medical staff has been a powerful tool for improving and maintaining healthcare quality, but it also has been responsive to economic incentives.

The role of gatekeeper has sometimes been an appropriate one for the hospital medical staff, and sometimes it has been abused. In addition to helping staff focus on maintaining quality, it has also been closely related to economic factors and the success of the staff physicians.

Today's hospital/hospital medical staff partnership is constructed in an environment of regulation more intense than at any other time. But these recommendations and requirements have emerged slowly, over a period of many years, as the concepts of clinical science, technology, and ethical responsibility have grown more complex.

Hospital medical staffs originally began as social organizations that facilitated an orderly referral of patients from one member to another, controlled the growth of the medical staff, and helped nurture the addition of new members deemed desirable. The mutuality of operating and economic interest among staff members and the hospital in which they operated was the powerful

glue that held them together, and the choices made in that mutuality would benefit the patient, whose best interest was served by the increasing availability of medical services.

This was convenient and economically productive at a time when the majority of care was on a fee-for-service basis. The economic basis for this exclusivity was also the basis for attacks on it by excluded physicians.

While the courts in the 1970s and 1980s forced hospital medical staff to become less exclusive and opened staff privileges to any qualified physician, the legitimate need to control access to staff had to be recognized and a new way had to be found to serve that need. There was, in part, as a response, a significant increase in externally imposed regulation on the hospital. This created many more complex responsibilities for the medical staff and its elected officers. Organizing and monitoring to ensure the quality of care became a substantial task. Later, there emerged complex reimbursement methodologies that required even more staff involvement in oversight, regulation, and assurance of fairness to the patient.

Hospital Management

Over the course of the past century, as hospitals increased in size and complexity, and the financing of care moved from self-pay to a third-party reimbursement system, healthcare administration as a profession evolved to meet these new challenges. Early hospital administrators were called superintendents, and they typically had little formal educational training for their jobs—many were nurses who had taken on administrative responsibilities. For example, more than half of the superintendents who were members of the AHA in 1916 were graduate nurses. Other hospital superintendents were physicians, laypersons, and Catholic nuns.

The first degree-granting program in hospital administration was established at Marquette University in Wisconsin. In 1927, two students, both women, received their degrees, but in 1928, the program, with no other graduates, failed.

In 1934, Michael M. Davis, a pioneer researcher in the economics, quality, and organization of medical care, developed the first graduate program in hospital administration at the University of Chicago. Davis recognized that most hospital

superintendents of the time lacked proper training in business. The new program was placed in the university's business school. Davis developed the curriculum, which included 1 year of academic course work in accounting, statistics, and management and a hospital residency. With the success of the program, other universities established hospital administration programs based on Davis's model.

Before the founding of the first graduate program in hospital administration, a group of practicing hospital superintendents came together in 1933 and formed the American College of Hospital Administrators (now the American College of Healthcare Executives [ACHE]), the first professional association for hospital administrators. And while both clinically trained and lay administrators could join the college, the emphasis was clearly on the lay administrator. Among the 106 charter fellows of the college, only 32 were physicians. Over the years, the college has grown; and today it is an international professional society of more than 30,000 healthcare administrators who lead hospitals, healthcare systems, and other healthcare organizations.

While hospitals have continued to evolve, the field of healthcare administration continues to sustain three primary objectives. First, healthcare administrators are responsible for the business and financial aspects of hospitals, clinics, and other health services organizations, and they are focused on increasing efficiency and financial stability. Their roles include human resources management, financial management, cost accounting, data collection and analysis, strategic planning, marketing, and the various maintenance functions of the organization. Second, healthcare administrators are responsible for providing the most basic social service: the care of dependent people at the most vulnerable points in their lives. Third, healthcare administrators are responsible for maintaining the moral and social order of their organizations, serving as advocates for patients, arbitrators in situations where there are competing values, and intermediaries for the various professional groups that practice within the organization.

The challenges faced by the healthcare administrators of hospitals are many. Shortages of nurses and other healthcare workers, concerns for the safety and quality of healthcare services, rising costs, the growing number of uninsured Americans, an aging population, and the rapidly changing

medical technology and practice make managing hospitals a complex and challenging task.

Benn J. Greenspan

See also Academic Medical Centers; Access to Healthcare; American College of Healthcare Executives (ACHE); American Hospital Association (AHA); Health Insurance; Hospital Closures; Joint Commission; Multihospital Healthcare Systems

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I

IATROGENIC DISEASE

Iatrogenic disease commonly refers to a physician-induced disease and more generally to a disease state caused by the commission of acts by the physician rather than the omission of needed treatment. The word *iatrogenic* comes from the root *iatro*, the Greek word for physician, or more generally a healer, and the word *genic*, meaning to come from or be created by. Thus, iatrogenic disease literally means a disease state that is brought forth by those who intend to heal. More broadly, however, the term *iatrogenic disease* has been referred to any adverse event that is associated with a healthcare provider, including a nurse or medical technician, or treatment. Iatrogenic disease poses itself as a risk to patients, and it can be the result of several factors including negligence, medical error, and/or the adverse effect of treatments. It is estimated that iatrogenic disease is the third leading cause of death in the United States.

Overview

Iatrogenic disease has been cited as a widespread national problem. In 2000, the national Institute of Medicine (IOM) released a report titled *To Err Is Human: Building a Safer Health System*. This landmark report estimated that between 44,000 and 98,000 deaths occur each year in the nation's hospitals from medical errors. An earlier report about medical errors in New York hospitals spurred the Joint Commission to create a sentinel

event-reporting system. After the IOM report, the Joint Commission created a set of national patient safety goals that were incorporated into the accreditation process to reduce medical errors.

The most obvious example of iatrogenic disease is medical errors. Common medical errors include performing an operation on the wrong body part or dispensing the wrong medicine due to negligence; however, this is only a small part of iatrogenic disease. The greatest amount of iatrogenic disease is caused by the unintended side effects or adverse effects caused by drug interactions. These adverse effects may range from mild disease states, such as impaired sleep or indigestion, to severe consequences, such as heart failure, stroke, and death. Sometimes, the adverse effects are known and accepted by the patient because the positive effects of the treatment outweigh the adverse effects. In these cases, while the resulting disease state is in fact iatrogenic, the term is often not applied because iatrogenic disease is generally used pejoratively.

Iatrogenic disease may also result in hospitalized patients acquiring nosocomial infections. For example, hospital staff may unintentionally transmit microbes during the routine patient encounter because of improperly sterilized medical equipment and through the use of unclean or ungloved hands.

Another example of iatrogenic disease derives from interventions that are done or not done as a result of financial incentives. For example, when a healthcare provider decides to use a certain medication because of its association with a

pharmaceutical company, any disease state that results from choosing the particular medicine over a more effective alternative is considered to be an iatrogenic disease. Thus, the referral for an intervention for the purpose of profit rather than for the best interest of the patient also results in iatrogenic disease. Many studies of physician behavior have documented that financial incentives change practice patterns.

Physicians also change their behavior in response to potential litigation, which can be brought on by medical negligence, an action punishable in the U.S. judicial system. This practice, often referred to as defensive medicine, may have positive outcomes because the behavior of the provider changes to try to avoid negligence. However, this behavior may also lead to unnecessary tests, procedures, and treatments, which ultimately result in iatrogenic disease.

A more complicated example of iatrogenic disease is the use of unproven diagnostic and therapeutic modalities. Many practice patterns in modern medicine are not definitively proven to be beneficial. The recently debunked routine practice of prescribing estrogen replacement therapy at menopause for women is a case in point. In this instance, a substantial amount of basic science data, as well as data from observational studies in women, strongly suggested that postmenopausal estrogen protected against heart attacks. However, the results from a randomized controlled trial (RCT), considered the gold standard of evidence-based medicine, showed that hormone replacement therapy actually caused myocardial infarctions. As a result, many women were having iatrogenic heart attacks for decades because of poor-quality data. Similarly, the currently accepted protocol for prostate cancer screening and treatment in men has been studied, and the findings suggest that these processes may lead to iatrogenic disease. To prevent this type of large-scale iatrogenic disease, modern medicine needs the right kind of evidence to guide its actions.

Iatrogenic disease is not limited to conventional medical practices, however. Alternative-medicine practitioners can also cause iatrogenic disease. For example, ephedrine, an active ingredient in many alternative weight loss products, was withdrawn from the market because it was shown to cause strokes.

Future Implications

Iatrogenic disease is a consequence of modern medicine; however, much of this burden can be reduced through a number of changes. For instance, medical errors are being tackled through error reduction strategies—a technique that has been successfully used in the aeronautics industry. Furthermore, the National Institutes of Health (NIH) funds large RCTs on many important treatment modalities, including alternative medicine. Additionally, many organizations have implemented incentives to improve healthcare quality, which are now being considered by Medicare. With new safety-oriented procedures, financial incentives geared toward patient safety and quality, tort reform, and emerging scientific evidence, iatrogenic disease can be overcome.

Gregory Vachon

See also Adverse Drug Events; Evidence-Based Medicine (EBM); Joint Commission; Malpractice; Medical Errors; National Patient Safety Goals; Patient Safety; Quality of Healthcare

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<http://www.theifc.org>

INDIAN HEALTH SERVICE (IHS)

The Indian Health Service (IHS), an agency of the U.S. Department of Health and Human Services (HHS), is the principal healthcare provider to American Indians and Alaska Natives (AI/AN) and acts as their health advocate. The mission of the IHS is to provide quality healthcare services to the 562 federally recognized tribes of American Indians and Alaska Natives. Its goal is to ensure comprehensive, culturally acceptable personal and public health services and to ensure that these services are available and accessible to those who are eligible. Since its inception, the IHS has been working with various tribes, urban Indian programs, and other Indian organizations to achieve these goals.

Background

The federal government has the responsibility of meeting the health needs of American Indians and Alaska Natives, as promulgated by the Snyder Act of 1921; the Indian Health Care Improvement Act (IHCIA), as amended; and the Indian Self Determination and Education Assistance Act (ISDEAA). The Snyder Act and the IHCIA have provided the authority for the federal government programs to deliver health services, while the ISDEAA promotes the tribal administration of federal Indian programs, including healthcare.

Established on July 1, 1955, the IHS works in partnership with American Indians and Alaska Natives to honor its goal of providing optimal care and to promote the physical, mental, emotional, and spiritual health of American Indians and Alaska Natives, along with protecting their sovereign rights. The IHS serves approximately

1.9 million of an estimated 3.3 million American Indian and Alaska Native population.

More than half of the IHS's budget is handled directly by the tribes. In turn, the IHS helps the tribes develop their health programs and coordinate their health planning using federal, state, and local resources. However, many of the tribes lack the necessary resources to manage their own programs. There is also a growing interest among managed-care organizations to contract with the tribes for clinical services. Some American Indian and Alaska Native leaders worry that these trends may undermine the federal government's responsibility to the tribes.

Health Disparities

While the overall health status of American Indians and Alaska Natives has improved in the past few decades, important disparities still exist between the American Indian and Alaska Native population and the general population in terms of mortality, disease rates, costs, and access to healthcare.

The five leading causes of American Indian deaths in 2004 were heart disease, cancer, accidents (unintentional injuries), diabetes mellitus, and stroke (cerebrovascular diseases). In contrast, the five leading causes of deaths for the entire population of the nation were heart disease, cancer, stroke, chronic lower respiratory diseases, and accidents.

Life expectancy for American Indians and Alaska Natives is lower than for all other races in the nation. The median age of American Indians and Alaska Natives is 28.0 due to high-mortality rates in early life. For example, the infant death rate is 10 per 1,000 live births compared with 7 per 1,000 for the entire U.S. population (2001–2003 rates).

Compared with the nation's population, American Indians and Alaska Natives more frequently die from tuberculosis (750% higher), alcoholism (550%), diabetes (190%), accidents (150%), homicides (100%), and suicides (70%). They also tend to suffer from higher rates of infectious diseases, likely the result of waste disposal and sanitation problems. American Indians and Alaska Natives have the third highest rate of HIV/AIDS diagnoses in the nation, and they are more likely to seek and receive treatment in the later stages of illness, thus resulting in shorter life spans.

American Indians and Alaska Natives have the highest rate of Type II diabetes in the world. The IHS healthcare expense per American Indian/Alaska Native is \$2,158 compared with \$5,921 for the U.S. population. The American Diabetes Association estimates that the average cost of diabetes care is more than \$13,000 per diabetic patient per year, largely due to the cost of pharmaceuticals. In the past, the emphasis of the IHS had been on the clinical care of diabetes and the prevention of complications rather than on the prevention of the disease itself, but that is changing.

Needed services are often rationed due to lack of funding. Funds are not distributed proportionally, and additional funds are not available should more money be needed for health services. The tribes may offer funds but often not enough to cover the shortfalls. Many facilities have negotiated discounts for contract care. Most hospitals have been willing to discount, but many physicians are not always as willing.

Availability of services depends on accessibility to IHS-funded facilities. However, not all IHS facilities offer the same services. And there is often a long waiting time between the call for an appointment and the actual service.

Some services cannot be provided on-site because of the growing complexity of medical care, which is beyond the scope of current IHS clinics and health centers. Sometimes, patients are forced to use contract care or to travel great distances to a discounted hospital or an IHS facility.

This presents a challenge to the private sector, having to deal with the social, cultural, and other characteristics that divide this population from other populations. American Indians and Alaska Natives are a very diverse group, and they cannot be all grouped together because of differences in language skills and customs.

Organization

The IHS is a complex organization, with myriad programs operating under varying circumstances across geographic areas.

Its main headquarters is located in Rockland, Maryland. It also has 12 area offices covering 35 states, most states being in the western portion of the country. Services are administered through these offices and 163 IHS- and tribally operated

service units. The basic organizational element of the healthcare program is the service unit usually serving the local community, and it is often hospital based.

The IHS has its own roster of physicians, nurses, aides, pharmacists, and dentists and is predominantly staffed by American Indians and Alaska Natives. The IHS operates 33 hospitals, 52 health centers, and 38 health stations. Tribal hospitals number 15, with 220 health centers and 116 health stations. There are 34 urban programs in existence, including community health and comprehensive primary healthcare services.

Future Implications

The costs of the IHS are increasing as a result of the overall increasing costs of healthcare and because of increases in the size of the American Indian and Alaska Native population. The eligible population was estimated to increase by 1.6% in 2007, or an additional 30,000 people, which means more healthcare demands for services now and in the future.

However, for FY2009, the IHS will receive federal funding of \$3.3 billion, a \$21.3 million cut. Given the rising costs and insufficient funding, along with a growing trend toward managed care, the IHS faces a challenging future in fulfilling its mission.

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See also Access to Healthcare; Cultural Competency; Diabetes; Ethnic and Racial Barriers to Healthcare; Health Disparities; Public Health; Rural Health; Vulnerable Populations

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INFECTIOUS DISEASES

Microorganisms are everywhere. They are found throughout the environment and by the billions on the skin and in the gastrointestinal and respiratory tracts. Most are quiescent, colonizing the host without producing disease or prevented from doing so by the body's normal defenses. Intact skin and mucosal surfaces, as well as specialized elements of the immune system, serve to limit the host-microbe interaction. However, when circumstances change and this delicate balance is disrupted, such as when a burn destroys intact skin, antibiotic therapy alters normal microbial flora, or surgery disturbs the normal anatomic barriers, microorganisms gain access to the host and create an opportunity for an infection to occur. An infectious disease then is a clinically evident disease affecting the host due to a microorganism or one of its products.

Microbial Factors

The variety of microorganisms capable of infecting humans is broad and includes bacteria, viruses, fungi, protozoa, helminthes, arthropods, and, rarely, proteinaceous substances called prions. Organisms that invade or damage tissue in a

healthy host are termed *primary pathogens*. Their virulence or capacity to cause disease depends on the number of organisms transmitted and their ability to enter tissues, evade the host's defenses and multiply, or produce extracellular products such as toxins. Organisms that invade and cause disease in a host with altered resistance are termed *opportunistic pathogens*. These organisms are often part of the host's normal flora, residing within the gastrointestinal or respiratory tracts, or may be acquired from the host's environment. They take advantage of the host's altered defenses, due to, for instance, genetic defects, immunosuppressive therapy, cancer chemotherapy, or changes in the antimicrobial flora due to exposure to an antimicrobial drug.

Transmission

An exogenous disease, such as malaria, is caused by a microorganism whose natural environmental reservoir is outside the body. Other infections, such as appendicitis, are caused by a constituent of the indigenous microbial flora and designated as endogenous diseases. Organisms may be transmitted to the host by several different mechanisms including direct or indirect contact, which includes hand contact or a sneeze; contaminated food or water; contact with a contaminated inanimate object; or the bite of an insect vector. Entry thus may be by inhalation, ingestion, injection, or direct implantation.

Once transmitted, the organism colonizes the host's tissue at the site or portal of entry before undergoing a period of multiplication, leading to subsequent invasion of tissue and/or production of disease-causing toxins. An infectious disease becomes clinically evident when the microbe invades locally and/or disseminates throughout the body and produces tissue injury or organ dysfunction. Injury may be a direct effect of the organism or its toxins. In some cases, it may be due to the host's own inflammatory or immune response. Some organisms grow only at a specific body site, while others disseminate widely. The host and/or microbe determine the factors accounting for this tissue tropism. Some microbes are obligate intracellular parasites and must invade cells for their survival; malaria spreads in this way. They often have surface molecules that facilitate entry into

their target cells. Other microbes use the host's own scavenger cells but resist the normal killing mechanisms to survive, proliferate, and cause an infectious disease, such as tuberculosis.

Host Immunity

Fortunately, most infections in the normal host are self-limited due to a series of immune mechanisms that have evolved over time. Innate immunity is not influenced by repeated infections, while adaptive immunity follows repeated exposure to an organism or its products. Innate mechanisms constitute the first line of defense. Mechanical barriers, such as skin and mucosal membranes, and normal secretions, such as tears, saliva, and urine, make entry into the body difficult. The indigenous microbial flora discourages pathogenic colonization by competing for binding sites and nutrients or producing inhibitory chemicals called *bacteriocins*. Invasion of the host produces a series of acute-phase responses manifested by mediator molecules such as interleukin-1 and the complement system. These reactions initiate the host's response to limit the spread of the pathogen.

Adaptive or specific immunity has two major coordinated components. The B-lymphocyte system produces specific immunoglobulins, or antibodies against the pathogen. The T-lymphocyte system activates the killer cells to attack intracellular microbes or produce cytokines, chemicals that stimulate other scavenger cells or macrophages, which then may limit the infection.

History

Microbes have populated the earth longer than man has existed, and infections have undoubtedly played a role in his survival. Plagues are noted in the Old Testament and occurred as man began forming aggregate groups large enough to sustain epidemics of new or evolving pathogens that could be transmitted from person to person. The origin of many infectious agents remains a mystery, but man became the established reservoir for many of these microbes. Infected animals and contaminated food and water were additional sources of other organisms. As there was little previous exposure to these microbes, the level of immunity was low, and mortality rates for infections such as

smallpox, rubella, and measles were high. As exposure continued, levels of immunity in the population rose, and resistance increased, leading to lower prevalence, reduced mortality, and more predictable patterns of occurrence.

The Greek physician, Hippocrates, the father of Western medicine, was one of the first to describe diseases such as malaria, tuberculosis, mumps, diphtheria, and probably influenza in enough detail to make them recognizable today. Epidemics of measles and smallpox occurred in ancient Greece and Rome. The Black Plague, which hit Europe in the Middle Ages, killed an estimated 25 million people, or 25% to 50% of the European population at the time.

The European settlement of the Americas in the 15th and 16th centuries introduced smallpox, measles, and typhus into New World populations with no immunity to these diseases. From 1511 to 1560, the population of Mexico declined from about 20 million to 3 million and then to 1.6 million by the turn of the 17th century. The colonization of the New World by Europeans was accomplished more by the pathogens they brought than by their traditional weapons.

Epidemics continue to unfold across the world due to both old pathogens and new ones. The Spanish flu pandemic of 1918 to 1919 killed 25 to 50 million people worldwide. Two other less virulent influenza pandemics occurred in the 20th century, and new strains of the influenza virus are continually emerging. According to many experts, another pandemic is inevitable.

The ability to control many of these pathogens has made great strides in the past several centuries. Edward Jenner developed the first vaccine for smallpox in 1786, which eventually led to its control. It became the first and only infectious disease to ever be managed and eliminated worldwide. The work of Robert Koch and Louis Pasteur and the introduction of the germ theory of disease made the control of infectious diseases possible. Isolation and identification of microbial agents led to descriptions of the epidemiology and natural history of many infectious diseases. By the end of the 19th century, water purification treatment, vector control, and rodent reduction programs were beginning to make strides in the control of many pathogenic microbes. The 20th century saw major public health strides in vaccine development

and usage for the control of polio, measles, mumps, diphtheria, and tetanus. These achievements have truly been one of the public health success stories throughout the developed world, and public health measures to control infectious diseases are having similar success, where implemented, in developing countries. Furthermore, such measures are extremely cost-effective. For example, every \$1 spent on a vaccine against measles, mumps, and rubella (MMR) saves \$21, while every \$1 spent on a vaccine against diphtheria, pertussis, and tetanus (DPT) saves \$29. However, these diseases have not disappeared. If effective vaccination campaigns are not continued until these microorganisms are eradicated everywhere, their reemergence is likely.

The serendipitous discovery of penicillin by Alexander Fleming in 1929 heralded a new age of the treatment of infectious diseases. For the first time, effective therapy for bacterial infections was possible. The post-World War II era brought the discovery and/or synthesis of many new antibiotics, leading to treatment of common infections of the lung, skin, and urinary tract and ever-increasing control of life-threatening bacterial infections such as tuberculosis and typhoid fever. Antimicrobials to treat various viruses, fungi, and parasites have also been developed. With the success of the new antibiotics, some physicians even predicted the end of infectious diseases—an optimistic view that was soon proven false. Unfortunately, microorganisms replicate rapidly, and within a few years of the development of antibiotics, resistance began to emerge. The last three decades of the 20th century brought a resurgence of resistant sexually transmitted diseases; increasing antibiotic resistance in common bacteria; as well as the identification of new infections such as legionnaire's disease, toxic shock syndrome, lyme disease, and acquired immunodeficiency syndrome (AIDS).

In 1992, the national Institute of Medicine (IOM) issued a report, *Emerging Infections: Microbial Threats to Health in the United States*, which emphasized the global nature of emerging pathogens. The landmark report outlines modern demographic, environmental, and behavioral changes leading to diseases of infectious origin whose incidence in humans has increased or threatens to increase in the near future.

Strategies for preventing these infections demanded both national and international

responses. The Centers for Disease Control and Prevention (CDC), in partnership with federal, state, and local agencies, foreign governments, the World Health Organization (WHO), and many groups in private industry, formulated plans to address these emerging infectious disease threats. In the United States, some success has been achieved with the reduction of childhood bacterial meningitis, group B streptococcal infections in infants, and bloodborne diseases such as hepatitis B and human immunodeficiency virus (HIV). Still, worldwide epidemics of tuberculosis, malaria, and AIDS continue. Tuberculosis infects up to one third of the world's population and causes 2 million deaths per year; drug-resistant malaria kills 1 million children in sub-Saharan Africa each year and has crept into new habitats; and AIDS has infected more than 40 million people to date and continues to spread throughout the developed and the developing world. Despite a century of scientific progress, infectious diseases still cause tremendous human suffering, deplete scarce resources, impede social and economic development, and contribute to global instability. Much more work needs to be done before the control of these major pathogens becomes a reality.

Infectious Diseases and Healthcare Today

Healthcare today is delivered in many venues, including physicians' offices, immediate-care clinics, specialty centers, long-term care facilities, emergency departments, and hospitals. The sickest and most vulnerable patients are hospitalized, undergoing the most procedures and interventions and receiving the most medications. They are at risk for a variety of healthcare-associated infections. The national Institute of Medicine's (IOM) report *To Err Is Human: Building a Safer Health System* estimated that hospital-related adverse events in the nation, including hospital-associated infections (HAIs), cause an estimated 44,000 to 98,000 deaths annually at a cost of \$30 billion. HAIs may affect as many as 5 to 15 per 100 hospitalized patients, with associated complications in 25% to 50% of patients in intensive care.

Attempts to prevent hospital infections began with Ignaz Semmelweis's introduction of hand washing with chlorinated lime solution to prevent maternal mortality at the Maternity Clinic in

Vienna in 1847. These efforts were continued with Florence Nightingale's *Notes on Hospitals* in 1863, in which she reported mortality rates for the main hospitals in the United Kingdom and noted the relationship between the lack of sanitary conditions and postoperative complications. In the United States and elsewhere, surveillance and the systematic collection, analysis, and interpretation of data form the basis of infection control essential for the evaluation and subsequent intervention to control infection risk in hospitals and other health-care settings. The CDC in the 1970s began the Study of the Efficacy of Nosocomial Infection Control (SENIC) Project to evaluate the effects of surveillance and reporting on hospital infection rates, and it found that 35% to 50% of all hospital infections were associated with just a few patient care practices: (a) the use and care of intravenous and urinary catheters, (b) surgical procedures, (c) mechanical support of lung function, (d) hand hygiene, and (e) the use of isolation precautions. During the past four decades, it has become clear that hospital-associated infections are good indicators of the quality of patient care. Interhospital comparisons, however, have been difficult due to differences in the severity of illness in patients and lack of standardization of methods of measurement. To reduce infections associated with these interventions, standardized guidelines and prevention programs have been introduced in most hospitals, and they have proven to be cost-effective. Prevention of the transfer of organisms from one patient to another via the hands of healthcare personnel is one of the most important interventions to control HAIs. Hand hygiene, including hand washing and/or the use of alcohol-based hand antiseptics, remains a major compliance problem that is being addressed aggressively in most healthcare settings. Guidelines have been revised, and campaigns including education, compliance monitoring, and feedback are becoming the norm.

Antimicrobial Resistance

The control of healthcare-associated infections has become complicated with the rise of microorganisms resistant to many commonly used antibiotics. The promise that bacterial infections would disappear or be easily controlled with antibiotics has disappeared. New multidrug-resistant organisms

(MDROs) are replacing older more susceptible ones. Today, this is one of the major problems confronting the control of infections, particularly in vulnerable populations in hospitals and long-term care facilities. The pharmaceutical cost of the development and approval of new antibiotics to successfully combat these new threats continues to escalate, and the incentives for a return on investment are diminishing. In the past decade, far fewer new antibiotics have been developed than needed, with only four developed between 2003 and 2007. Of these, only one was a novel drug. Hospitals are currently having to deal with an increasing number of patients with infections due to resistant staphylococci, *Escherichia coli*, and *Candida* species. Most of the hospital-acquired infections in intensive-care units are due to these and similarly resistant organisms. Unsuspected resistance can lead to treatment with an inappropriate antimicrobial, one in which the microorganism is not susceptible. Treatment courses are longer, hospitalization is prolonged, and mortality rates are higher in those infections due to resistant organisms. Controlling these infections in the hospital depends on early detection, hand hygiene, implementation of isolation precautions, and appropriate use of available antibiotics, all of which increase hospital costs in days of decreasing reimbursement. Other healthcare settings, especially long-term care facilities and hospital emergency departments, are facing similar problems.

Effective therapy depends not only on the susceptibility of the organism to the antimicrobial but also on host factors, the virulence of the organism, and the pharmacology of the drugs. Ideally, the choice of an appropriate antimicrobial should strive for maximal efficacy, with minimal toxicity, at the lowest cost, and with the smallest risk of inducing further resistance. To maintain the efficacy of the antimicrobials in use today, several strategies have been instituted or are needed. These approaches include the following: (a) campaigns to educate physicians and the general public to avoid using antimicrobials for common infections such as viral upper-respiratory infections in children or acute bronchitis in otherwise healthy adults; (b) new government regulations limiting the use of antimicrobials in animal feed, which drives the development of resistance in

human pathogens; (c) optimal development and use of vaccines to prevent common diseases such as ear infections and pneumonia in children; and (d) appropriate funding for public health programs to monitor and control emerging and reemerging pathogens.

Unless Americans become better stewards of current antimicrobials and encourage research and development of new ones, the ability to treat even common infections will diminish. Infectious diseases may return as the most common cause of death in the nation.

The impact of the national IOM's *To Err Is Human: Building a Safer Health System*, which included healthcare-associated infections, in terms of morbidity, mortality, and costs sparked organizations such as the Institute for Healthcare Improvement (IHI) to develop several new programs, guidelines, and standards for patient care and safety within healthcare systems. The Five Million Lives Campaign, started in 2007, targets, among other goals, reduction from harm caused by surgical-site infections and infections caused by the multidrug-resistant *Staphylococcus aureus*. Furthermore, several state legislatures are contemplating new laws for screening of patients on entry into the hospital to limit the spread of multidrug-resistant organisms in an effort to address quality-of-care issues. Whether these costly programs will have a lasting impact in today's healthcare milieu remains an open question.

Future Implications

The past several decades have witnessed the emergence of new infectious diseases and the resurgence of infectious diseases once considered vanquished. Today, many microorganisms are resistant to antibiotics, and treatment of infectious diseases is becoming more complex and expensive. New antibiotics and antiviral agents need to be developed, as well as new molecular techniques to better detect and trace the spread of microorganisms rapidly and globally.

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See also Acute and Chronic Diseases; Continuity of Health Service Operations During Pandemics; Disease; Emerging Diseases; Epidemiology; Iatrogenic

Disease; International Classification of Diseases (ICD); Public Health

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- Infectious Diseases Society of America (IDSA): <http://www.idsociety.org>
- Institute for Healthcare Improvement (IHI): <http://www.ihi.org>
- Society for Healthcare Epidemiology of America (SHEA): <http://www.shea-online.org>

INFLATION IN HEALTHCARE

Inflation in healthcare is the continued increase in the price of healthcare goods and services. Inflation in healthcare is reported in several ways. First, the rate of growth in per capita healthcare spending is often compared with the rate of growth in the per capita gross domestic product (GDP) to measure whether healthcare spending is growing faster or slower than the overall economy. Second, national health expenditures as a percentage of GDP are used to determine whether healthcare spending as a proportion of overall spending is growing over time. National health expenditures as a percentage of GDP have steadily increased in the United States from 7.0% in 1970 to 16% in 2007.

Another important measure of inflation in healthcare in the nation is the consumer price index (CPI). The CPI is an overall measure of average retail price changes over time. Medical care is included as two components of the CPI, measuring medical-care services, including professional medical services, hospital and related services, and health insurance, and medical-care commodities, including prescription drugs and nonprescription drugs and medical supplies. Since the CPI measures inflation for goods and services purchased at the retail level, it is limited to out-of-pocket spending for medical care by consumers and excludes, for example, payments for health insurance coverage by employers and the government.

Factors Driving Inflation

Inflation in healthcare can be caused by factors that are related to either the demand or the supply of a healthcare good or service.

Demand-Side Factors

Demand-side factors associated with escalating healthcare spending include changes in the demographic composition of the population, changes in health insurance coverage, changes in the health status of the population, and general economic conditions (e.g., growth in personal incomes, proportion of the population living in poverty).

Demographics can influence healthcare inflation through changes in age, gender, ethnicity/race,

and geographic region of residence. Older people have a higher prevalence of chronic health conditions and use more healthcare resources than younger people. As the nation's population ages, per capita healthcare spending also increases.

Changes in health insurance coverage influence healthcare inflation by changing the consumer demand for healthcare. Increases in health insurance coverage, through more comprehensive coverage or reductions in consumer cost sharing, reduce prices to the individual consumer and increase demand for healthcare. When managed-care organizations increase provider choice by broadening networks and reducing referral restrictions, per-enrollee spending may also increase. Conversely, shifting more costs to the individual consumer through higher copayments or deductibles, for example, decreases the demand for healthcare.

Although considered as a small component, the health status of the population is another driver of healthcare inflation. Behavioral factors such as obesity, smoking, and a general sedentary lifestyle increase healthcare spending. As a population becomes less healthy, per capita healthcare spending also increases.

Finally, growth in personal income may also drive demand for healthcare. Healthcare is a normal good, meaning that as a consumer's income increases, he or she demands more healthcare services.

Supply-Side Factors

Supply-side factors related to escalating healthcare spending include provider supply, changes in provider operating costs, changes in provider payment mechanisms, and advancements in technology.

Changes in the overall provider supply and a mix of the types of providers is one supply-side driver of inflation. Specialists have been shown to use more expensive technology and resources, while midlevel providers, such as nurse practitioners and physician assistants, may be lower-cost alternatives.

Provider operating costs, including wages, medical malpractice premiums, and other operating expenses, can influence inflation. Continued increases in medical malpractice premiums increase operating costs and also encourage increases in defensive medicine, liability-induced changes in

healthcare goods and services provided to an individual patient as a way of reducing the likelihood of incurring a lawsuit. Malpractice litigation accounts for some of the differences in healthcare inflation between nations that are more versus less litigious. Furthermore, shortages in specific labor markets, such as the nurse labor market, also increase inflation by driving up provider operating costs.

Provider payment mechanisms may also influence inflation. Fee-for-service payment mechanisms encourage overutilization, while capitation-based payment mechanisms encourage more cost-effective utilization.

Technological innovations and improvements, such as new equipment, new medical and surgical procedures, and new pharmaceutical drugs, are another driver of healthcare inflation. New technologies may create demand for care that did not previously exist, may increase demand for treatments that are less invasive or have an improved prognosis over older treatments, and may be more expensive per treatment.

Solutions to Mitigate Inflation

Both supply-side and demand-side interventions have been used to mitigate the continued increases in healthcare prices. In the United States, price controls have been implemented for both hospitals and physicians in an effort to reduce price increases. Medicare uses a prospective payment system (PPS) based on Diagnosis Related Groups (DRGs) to control hospital costs and uses the National Physician Fee Schedule to reimburse physicians for professional services. Many private payers also use variations of Medicare's PPS and physician fee schedule. Managed care has been used as a mechanism to reduce healthcare spending primarily through supply-side incentives such as capitation; primary-care gatekeeper physicians; prospective, concurrent, and retrospective utilization review; second-opinion examinations; and prior authorization requirements.

Future Implications

Strong supply-side incentives to mitigate healthcare spending increases, such as those provided by health maintenance organizations (HMOs), have

waned in recent years. In response to a backlash by providers and consumers to the stringent controls used by many managed-care organizations, incentives to control healthcare spending have shifted to the individual consumer. High-deductible health plans coupled with health saving accounts have been touted by both the federal government and employers as a mechanism to reduce rates of healthcare spending growth by shifting more costs to the individual consumer. It seems likely that such plans will greatly increase in the future.

Tricia J. Johnson

See also Competition in Healthcare; Cost of Healthcare; Healthcare Financial Management; Health Economics; Health Insurance; Malpractice; Payment Mechanisms; Technology Assessment

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- National Coalition on Health Care (NCHC): <http://www.nchc.org>

INFORMED CONSENT

Informed consent is the process by which a provider and patient discuss the merits of a proposed therapeutic intervention, and it serves as a significant component of the provider-patient relationship. Informed consent is neither a signature on a consent form nor a tool to avoid a lawsuit, but rather, it is a communication process. The informed-consent process typically includes a discussion between the provider and the patient to help guide the patient's decision to undergo or forgo a specific treatment or intervention. The informed-consent process is an ethically and legally required discussion that is tailored to the particular needs of the patient and to the specific medical circumstances. Informed consent occurs prior to and separate from documentation of any form. During the informed-consent process, patients also have the opportunity to ask questions so that they have a better understanding of the proposed course of treatment and therefore are able to make an informed decision based on all the risks, benefits, and alternatives. The informed-consent process is a distinct, identifiable, and essential factor of patient care in procedurally based specialties such as surgery. In specialties that are not procedurally based, such as internal medicine, the informed-consent process happens naturally during the provider-patient discussion; it is, however, no less essential to building a trusting relationship.

Informed consent should not be coerced, manipulated, threatened, or induced by fraud. The person with the requisite knowledge and experience to perform the therapeutic intervention and explain the critical elements is required to disclose to the patient the diagnosis, the proposed therapy and the rationale for recommending it, the associated risks and anticipated benefits, the available alternatives, and the consequences of refusing treatment. A competent patient retains the right to refuse appropriate treatment. A strong treatment recommendation by a provider is not, however, considered coercion as long as the recommendation is made to the decision maker.

There are four exceptions to the informed-consent disclosure: (1) in emergent situations when life and/or limb are immediately at risk, (2) if the patient is unconscious or incompetent and no

legally authorized patient representative is available, (3) if the patient declines the right to know the information, and (4) if the provider determines that disclosing the information to the patient would actually cause greater harm. The fourth exception, often called therapeutic knowledge, is discouraged in most healthcare institutions, but it is applied on a regular basis under the guise of paternalistic medicine. This entry highlights the experiences and challenges of the informed-consent process in the United States, the United Kingdom, Canada, and Australia.

Overview

Informed consent is based on the contemporary perception of autonomy, or self-determination, which arose from 17th-century political and legal philosophy. The concept of autonomy in the Australian, Canadian, British, and American medical fields, however, did not surface until major social changes took place in the mid 20th century. The American, Australian, Canadian, and British medical societies finally officially recognized patient autonomy in the 1980s. Despite the British medical community's acknowledgment of a patient's right to autonomy, the British legal system remains disproportionately paternalistic compared with that of the United States, Australia, and Canada.

Recent technological advancements have made information more readily available and accessible. As a result, the widespread dissemination of medical information, written in nontechnical language to be easily understood by those who are not medically trained, has led to a change in patients' overall attitudes toward providers. It has also influenced patients' willingness to accept providers' diagnostic and therapeutic decisions and patients' requests for specific medicinal or procedural interventions. Nonetheless, providers still must provide patients with accurate information and facts to help them make appropriate healthcare decisions; without the expertise of medical professionals, individuals may base decisions on marketing and promotion campaigns. Medicine itself has significantly changed because of these scientific advancements. The general use of anesthesia, for example, makes it impossible to obtain a patient's consent to change a surgical plan at the

exact time a surgeon is legally required to obtain it. Providers are able to diagnose seriously ill patients before the patients themselves know it or feel sick, and the number of therapeutic options to select from has increased exponentially. Thus, proper informed consent in this rapidly changing environment is paramount.

Legal Dimensions of Informed Consent

The advancement of the idea of self-determination forms the legal foundation for informed consent. The legal causes of action related to informed consent are battery and negligence. For example, if a provider touches a patient without that patient's explicit consent, then the provider is considered to have committed an act of battery even if the provider believed that the action was in the best interest of the patient. If, however, the provider touched the patient in the exact way in which the patient had consented but failed to provide the patient with pertinent information that the patient considers necessary to decide whether to consent, then the provider is considered to have committed an act of negligence.

The United Kingdom and the United States have long recognized the legal and ethical obligation for informed consent. Comparatively, in Canada and Australia, informed consent is a relatively new concept. Battery was the leading cause of action in the United States and United Kingdom until 1957, when jurists began to hold that negligence was the appropriate cause of action for an alleged breach of a physician's duty to care, specifically the duty to disclose information to patients. However, Canada and Australia base the causes of action on the premise of negligence.

Two legal standards exist for disclosure of information to patients: the professional standard and the reasonable-person standard. The professional standard states that a provider must disclose information that is usually made available by the medical profession. British courts have exclusively used the professional standard. On the other hand, the reasonable-person standard states that a provider must disclose information as to what a reasonable person in the patient's position would want to know in order to decide whether to undergo or forgo a therapeutic procedure or intervention. The reasonable-person standard is

used solely by the Australian judiciary. Canada uses the professional standard with regard to diagnosis only and the reasonable-person standard for disclosure of material information. The United States also uses both the professional standard and the reasonable-person standard. Judicial preference in the United States, however, is clearly for the reasonable-person standard. Successful lobbying by the medical profession resulted in 25 state legislatures enacting professional-standard statutes.

Defenders of the professional standard, independent of country, argue that the standard is consistent with a provider's obligation to provide care in the patient's best interest by providing him or her with the latitude to decide what information to share. The provider, because of his or her medical knowledge and training, is more qualified to make medical decisions for the patient and to determine what information will only serve to confuse or scare the patient. Proponents of the reasonable-person standard, however, argue that this other standard reconciles the tension between a provider's duty to disclose information and a patient's right to make an informed decision with regard to his or her healthcare. The patient cannot make an informed decision without the provider at least providing a modicum of material information. Patients look to providers for guidance, advice, and information that they feel is necessary to decide whether to trust the provider enough to voluntarily agree to consent to the therapeutic intervention. Many have argued that the professional standard is no longer viable and that the reasonable-person standard better serves patients' needs.

Australia and Canada have based their standards for disclosure and causes of action on the legal precedence set in the United States and the United Kingdom. Although there is some indication that Australian, Canadian, and U.S. legal decisions are influencing the beliefs of the British judiciary, currently the English system remains steadfastly wedded to the professional standard for disclosure.

Impact of Healthcare Delivery and Cost

From a delivery-of-care and healthcare systems perspective, engaging in the informed-consent

process requires financial resources and organizational oversight. In the United Kingdom, Australia, and Canada, the healthcare system bears the cost of the provider's time devoted to informing patients. In the United States, the ethical and legal obligation to engage in the informed-consent process approximates to an unfunded mandate as both patients and providers bear the cost. The major healthcare insurance plans do not allow providers to bill for informed-consent discussions, leaving providers to incorporate the discussion into other billable procedures. This practice often causes the discussion to be rushed and/or incomplete. It also means that a provider may delegate the obligation to obtain informed consent to an individual who does not possess the same amount of knowledge of and experience with the therapeutic intervention, resulting in the patient receiving inadequate or incorrect information.

As with financial resources, the United Kingdom, Australia, and Canada have a centralized process for making decisions regarding informed consent. Administrators and providers collaborate to decide on the minimum amount of information that must be disclosed to the patient. In the United States, however, the process is decentralized. It is left to the individual organization or provider to discern which standard for disclosure to follow in order to provide the legally required minimum amount of information to patients.

Impact on Public Health

Informed consent not only affects the individual patient, but it also has profound effects on public health. Through informed consent, providers can engage patients in discussions to prevent and manage chronic diseases and help patients understand the consequences that these diseases have on their health and lifestyles. Providers can also protect the spread or reemergence of infectious disease by reminding patients of the cost of complacency about vaccination. They can also help patients avoid resistance to medications, as well as prevent early mortality, by taking joint responsibility for patient compliance. Finally, providers can rebuild and strengthen the social contract that the medical profession has with the community and with the individual patient.

Future Implications

As greater emphasis is placed on patient autonomy, providers must find a method of reconciling the ethos of paternalism with the patient's right to self-determination. The medical community, not jurisprudence, must take responsibility for developing an informed-consent doctrine that acknowledges and respects patient autonomy while simultaneously supporting the authority of the provider in diagnosis and treatment. This goal can be accomplished through shared decision making and acknowledging the limits of scientific knowledge.

Understanding the degree and accuracy of information communicated during the informed-consent discussion and enhancing the process will benefit both public health and patient care. By viewing informed consent as a therapeutic component of patient care, the provider shows respect for the patient, engages the patient as an active participant in healthcare decisions, improves the patient's understanding of the risks associated with certain behaviors, and increases compliance with suggested medical therapies. This partnership enables the provider to address the patient's concerns at the appropriate time and to build a foundation of trust. The trend toward an increased deference for patient autonomy is growing in the United States, Canada, Australia, and even the United Kingdom.

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See also Adverse Drug Events; Ethics; Health Literacy; Malpractice; Medical Errors; Physicians; Randomized Controlled Trials (RCTs); Vulnerable Populations

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INNER-CITY HEALTHCARE

Almost half of the world's population resides in an urban area, where some of the most pressing social problems include poverty and pollution. The rapid urbanization of regions has resulted in the need to address a variety of social issues, ranging from poverty, sanitation, and healthcare to education, housing, and family planning.

The inner city is generally characterized as an area of a city where there are a disproportionate number of unemployed or low-pay individuals, single parents, and sick or disabled persons living in poor housing conditions. Inner-city healthcare is a multifaceted issue that relates to the health disparities that exist within the poorer and more densely populated areas of a city. Individuals who reside within the inner city often experience inequalities in health due to lower socioeconomic status, job loss, and various health problems. The health issues of the inner city involve a complex and myriad set of interactions between socioeconomic, behavioral, and environmental factors that relate to race and ethnicity. Some of the most prevalent public health threats in the inner city include homelessness, substance abuse, mental illness, HIV/AIDS and tuberculosis transmission, violence, and pollution. The public policies of an

area can also exacerbate the health conditions of the inner city by not providing adequate housing, social welfare, and access to healthcare. It has been posited that the health problems that evolve in the inner city may also spread to other urban, suburban, and even rural areas. As a result of these consequences, a multifaceted approach is needed to improve the overall health status of inner-city residents.

Overview

The issue of poverty is at the crux of the poor state of health of the inner city. The link between socioeconomic status and health has been previously demonstrated. Poverty is related to poor health, by the barriers created in accessing preventive healthcare, proper nutrition, and housing, as well as to higher mortality rates. Poverty has also been associated with higher rates of violence, child abuse, and familial and community deterioration. There is also some emerging evidence to suggest that the disparity in the distribution of income within states has adverse effects on health, and therefore the distribution of income may be a predictor of the health status of a society.

The phenomenon of an urban health penalty has been used by the American College of Physicians (ACP) to describe the situation when healthier and more affluent residents leave a city and the residents who remain encounter serious health problems that interact with the physical and economic decline of a city. Generally speaking, disproportionate numbers of racial and ethnic minorities inhabit these inner-city areas, which are characterized by economic decay and a multitude of health problems. The issues related to urban health are the consequence of a complex set of interactions between behavioral, socioeconomic, and environmental factors.

Inner cities are challenged by the issues of cost, quality, and access to healthcare, much like the larger U.S. healthcare system. These issues, however, are magnified in inner-city areas because of scarce resources and stresses on the system. Because of this, inequalities and injustices in the health of inner-city residents are readily apparent. The health problems of the inner city include a range of chronic and acute illnesses, such as substance abuse, violence, teenage pregnancies, HIV/AIDS,

sexually transmitted diseases (STDs), mental illness, infant mortality, asthma, tuberculosis, and diabetes. The determinants associated with these health problems are poverty, poor nutrition, lack of adequate housing, violence, and the dearth of social services. The lack of access to appropriate healthcare facilities also exacerbates the problems in these areas. Studies have found that there are differences in preventable hospital admissions between high- and low-income areas throughout the United States. Furthermore, even individuals with universal access to healthcare from Medicare still experience differences in health outcomes. A study by Marian Gornick and colleagues comparing Whites and Blacks found that Blacks and lower-income individuals received fewer preventive services, such as immunizations and screenings, and experienced higher mortality rates. Another study by C. McCord and H. P. Freeman found that the mortality rate in Harlem, New York, is higher than that of the developing country of Bangladesh, which is characterized as having one of the lowest incomes in the world. Additionally, this study found that the survival rate of males beyond the age of 40 is lower in Harlem than in Bangladesh. The reasons cited as the cause of the higher mortality rate in Harlem include cardiovascular disease, diabetes, influenza, homicide, and drug dependency.

Even in egalitarian countries such as Canada, where it is assumed that disparities are nonexistent because of universal access to healthcare, inequalities in health outcomes still remain. A study by David Alter and colleagues found that residents in Ontario from the wealthiest neighborhoods received 23% more coronary angiograms and had 45% shorter waiting time to receive an angiogram than those from the poorest neighborhoods. The authors also found an inverse relationship between mortality 1 year after myocardial infarction and income.

Violence

Violence has been cited as a major cause of morbidity and mortality among young adults and adolescents. Studies have shown that youths in the inner city are often exposed to violence. Violence in these communities can lead to the destruction of social relationships and cause social disarray.

Individuals who engage in violent acts are more likely to be of a lower socioeconomic status and have been physically abused. Violence can have an adverse effect on the mental health of young individuals residing in the inner city and may result in suicidal ideation, posttraumatic stress disorder, and depression.

Mental Illness

Mental illness is one of the major health problems confronting the inner city. One study by P. Koegel and colleagues estimated that 28% of homeless individuals in Los Angeles's Skid Row were chronically mentally ill. Compared with a household sample, the rates of major mental illnesses in this cohort were disproportionately high for every mental disorder examined. Additionally, the rates of substance abuse and schizophrenia were higher among those who were repeatedly homeless or were homeless for longer periods of time.

Asthma

Residents who are poor and reside in certain urban areas and are predominantly racial/ethnic minorities are at greatest risk of developing asthma. The association between living in certain urban neighborhoods and a disproportionate risk of developing asthma has only recently been recognized. Studies have highlighted the geographic variation in asthma deaths in the United States and found that children and young adults who reside in urban areas have significantly higher death rates. On closer examination, it has been found that the death rates from asthma in urban areas are concentrated within the inner-city areas, where poverty is also high. Blacks are reported to have higher rates of asthma at all ages than Whites. A strong correlation is indicated between socioeconomic status and prevalence of asthma. Studies have shown that socioeconomic status is a major factor in the disproportionate burden of inner-city asthma. The living environment, which is highly correlated with socioeconomic status, plays a large role in asthma prevalence. Exposure to pollutants in the living environment may result in the onset of asthma. Family structure and dysfunction may also have a role in asthma morbidity and management.

HIV/AIDS

HIV is another public health concern in the inner city. A variety of risk factors and the lack of healthcare facilities contribute to the high prevalence of HIV in these areas. The use of alcohol and cocaine, particularly crack, has been linked to the spread of STDs and HIV in the inner city. Crack use is thought to contribute to the heterosexual transmission of HIV. Injection drug users are also at risk for HIV transmission by sharing contaminated needles. Men who have sex with men and commercial sex workers also present themselves as potential risk factors for HIV transmission. Given these numerous risk factors, HIV prevalence remains high in the inner city.

Nutrition

The lack of access to fresh food and produce intertwined with the issue of poverty in the inner city results in the poor nutritional status of inner-city residents. Research on an elderly inner-city population found that these residents are at high nutritional risk and lacked resources to pay for food, had poor food intake, and were unable to prepare food. Furthermore, childhood obesity is becoming a major problem among inner-city children. The lack of physical activity and lack of nutritious foods have been cited as the cause of this condition.

Research in the Inner City

Participation by community members is essential to build lasting public health interventions in the inner city. In 1995, the U.S. Centers for Disease Control and Prevention (CDC) established three urban research centers (URCs) to improve the health and quality of life of urban residents in New York, Detroit, and Seattle. The aim of this project was to develop collaborative partnerships among researchers, academics, private and public partners, and community members to create sustainable and effective interventions through community-based participatory research. Through its preliminary work, the URCs established research priorities, acquired core funding, and raised their ability to conduct community-based research. Some of the initial challenges experienced by the URCs included gaining the trust of the community, balancing power, acquiring resources, and

developing effective interventions. The problems common to all the URCs included institutional racism, time constraints, and distribution of resources. Despite these challenges, the work of the URCs resulted in collaborative partnerships, public health programs, and institutional capacity to carry out community-based participatory research in urban areas.

Short-Term Solutions

Addressing the widespread health problems of the inner city poses many formidable challenges and requires a multifaceted and broadly sweeping approach, from primary prevention to specialized and acute care. Changing urban policy to address the root cause of poverty is necessary to mitigate the health problems faced by these communities. As a first step, the link between socioeconomic factors and health status must be recognized to improve the health of inner-city residents. Furthermore, the healthcare delivery system in these areas must be improved by addressing the issues of coverage, providers, and public health. Adequate healthcare coverage must be made available for inner-city residents to access the healthcare system. The Medicaid safety net is an important part of securing access to healthcare for the low-income and vulnerable populations.

Primary-care providers are also an essential component in delivering healthcare to inner-city residents. One of the biggest shortcomings of the healthcare system is the limited number of primary-care providers who practice and deliver care to the urban poor and the decline of office-based primary care in these underserved areas.

The inner city is also plagued by some of the most pressing public health problems, including tobacco use, substance abuse of alcohol and drugs, teenage pregnancies, and violence. The most effective solutions to addressing these problems go well beyond the biomedical model, and it must include the public health approach of primary prevention and education. The environmental context of the inner city, including housing, unemployment, pollution, and violence, must also be properly addressed. These initiatives require collaboration among the government, healthcare providers, communities, and individuals.

The reform and changes to the Medicaid program in the late 1990s have also made it more difficult for the neediest citizens, particularly those who live in the inner cities, to receive needed healthcare. Medicaid managed care and the restriction of providers who can participate in the program have proved to be a challenge. Furthermore, the welfare reform bill, Temporary Assistance for Needy Families (TANF), has made it more cumbersome for needy individuals to receive welfare assistance and food stamps. Nutrition programs are a vital component of the safety net for the urban poor, especially children.

Future Implications

The United States has the most advanced medical technologies available, yet the health of its inner-city residents remains poor. Healthcare reform has been tremendously difficult to achieve, and programs targeting the underserved, including the urban poor, have been minimal. As the federal government continues to reduce funding, the states will have greater responsibility for caring for their most marginalized citizens living in the inner city. It is likely that initiatives targeting the health of inner-city residents will continue to be advocated in the years to come.

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See also Access to Healthcare; Centers for Disease Control and Prevention (CDC): Community-Based Participatory Research (CBPR); Ethnic and Racial Barriers to Healthcare; Health Disparities; Medicaid; Medicare

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INSTITUTE FOR HEALTHCARE IMPROVEMENT (IHI)

The Institute for Healthcare Improvement (IHI) is an independent, nonprofit organization helping to lead the improvement of healthcare throughout the world. Founded in 1991 and based in Cambridge, Massachusetts, the IHI works to accelerate improvements by building the will for change, cultivating promising concepts for

improving patient care, and helping healthcare systems put those ideas into action. Employing a staff of approximately 100 individuals and maintaining partnerships with hundreds of faculty members, the IHI offers comprehensive programs that aim to improve the lives of patients, the health of communities, and the joy of the healthcare workforce.

Background

Healthcare is a highly complex system, vastly underperforming its potential. The gap between what healthcare achieves today and what it could achieve at the same or lower cost is so large that the National Academy of Sciences, Institute of Medicine (IOM), declares it a “chasm.” Crossing this chasm will require massive change. There are examples of excellence—organizations that have overcome obstacles and redesigned patient care. The challenge is to make these examples the rule, not the exception, so that all patients reliably receive the best care possible.

The IHI was formed to help healthcare cross the quality chasm—to shepherd a growing movement of healthcare leaders trying to find alternatives to the status quo.

Organizational Goals

Improving healthcare is the IHI’s fundamental mission and daily work. The institute has adapted its goals from the IOM’s six improvement aims for the healthcare system: care that is (1) safe, (2) effective, (3) patient centered, (4) timely, (5) efficient, and (6) equitable. The IHI calls this the No Needless List, which includes the following: no needless deaths, no needless pain or suffering, no helplessness in those served or serving, no unwanted waiting, no waste, and no one left out.

The IHI seeks to accelerate the measurable and continued progress of healthcare systems toward these bold objectives, leading to breakthrough improvements that are truly meaningful in the lives of patients. The institute accomplishes this by building the will for change, cultivating innovative improvement ideas, and helping healthcare systems put those ideas into action.

Learning System

The IHI’s programs and activities connect people from across the world in an ever-evolving learning system, based on a philosophy of “all teach, all learn.” This system enables committed individuals and organizations to collaborate on improving healthcare—because it is far easier to improve together than it is to do it alone. The system includes four components: (1) innovation, (2) strategic relationships, (3) learning opportunities, and (4) knowledge of the world.

Innovation

At the center of the institute’s work is the creation and testing of new ideas—novel concepts for improving patient care. The IHI collaborates with a handful of cutting-edge organizations, on a project basis, to test new solutions on old problems through research and development that drive the organization’s work.

Strategic Relationships

Once a promising change concept has been successfully developed in one setting, it needs to be fully vetted and piloted in other settings. The IHI maintains a variety of closely aligned strategic relationships, with dozens of organizations, that test and deploy these changes. The most common types of relationships are strategic partnerships, the International Management Package for Administration of Clinical Trials (IMPACT), and learning and innovation communities.

Strategic partnerships are high-level relationships focused on transforming entire systems of care by concentrating on strategic objectives and system-level improvement. In addition to working closely with several major healthcare systems in the United States, the IHI is also involved in strategic-level efforts with providers in the United Kingdom, Sweden, Malawi, and South Africa.

IMPACT is the IHI’s membership network for change, where healthcare organizations come together to achieve dramatic improvement results in clinical outcomes, patient and provider satisfaction, and financial performance. More than 200 quality-minded organizations participate in change initiatives that combine a leadership agenda with a focus on frontline improvement and measurement.

Learning and innovation communities are collaborative change laboratories focused on frontline improvement. Participating organizations work with each other and with IHI faculty to rapidly test and implement meaningful, sustainable change within a specific topic area. Learning and innovation communities are the “next-generation” evolution of the Breakthrough Series, the IHI’s traditional methodology for collaborative improvement.

Learning Opportunities

The IHI offers a wide variety of opportunities for healthcare professionals to learn from expert faculty and experienced colleagues across the world. Some of its learning opportunities include the following: conferences and seminars, Web-based programs, and professional development programs.

The IHI’s annual National Forum is widely viewed as the premier meeting place for people committed to the mission of healthcare improvement. The institute also presents an annual conference on clinical office practice improvement and offers seminars on various quality-related topics.

The institute’s Web programs create opportunities for organizations and individuals to learn and implement best-practice ideas through a series of Web seminars. A variety of online presentations and teaching modules are also available on the IHI’s Web site.

The IHI’s professional development programs are designed for leaders who seek to gain a particular set of skills that are required for an organization to succeed in its improvement agenda. Programs include training for board members, patient safety officers, improvement advisors, operations managers, as well as others involved in critical roles.

Knowledge for the World

The final step in the IHI learning system is the broad dissemination of best-practice improvement knowledge. This is done primarily through various campaigns, IHI.org, professional education, and the institute’s fellowship programs.

In line with many other patient safety programs, the “100,000 Lives Campaign” was a national initiative to drive widespread adoption of six important patient safety practices in U.S. hospitals

between December 2004 and June 2006. Approximately 3,100 hospitals in the nation joined in that effort. Building on this momentum, the institute initiated the “5 Million Lives Campaign,” which aimed to help even more hospitals prevent 5 million incidents of medical harm. The campaign ran between December 2006 and December 2008.

The institute’s online resource, www.IHI.org, contains a wealth of improvement information and tools—available free of charge to anyone, anywhere, whose aim is to improve healthcare.

Through the institute’s Health Professions Education Collaborative (HPEC), academic leaders from dozens of schools of medicine, nursing, pharmacy, and health administration work together to integrate quality improvement into their curricula, so that tomorrow’s health professionals are better prepared to drive this agenda forward.

Last, the IHI’s fellowship programs help equip healthcare leaders with the drive, skills, and experience to spread improvements in the United States and globally. The fellowship programs are sponsored by the George W. Merck family, the Health Foundation, and the Commonwealth Fund. Fellows spend 1 year at IHI, creating a custom-designed education plan and participating in a variety of strategic initiatives.

Jonathan Small

See also Berwick, Donald M.; Disease Management; Medical Errors; Outcomes Movement; Patient Safety; Quality Indicators; Quality Management; Quality of Healthcare

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Web Site

Institute for Healthcare Improvement (IHI):
<http://www.ihl.org>

INSTITUTE OF MEDICINE (IOM)

The 21st century has brought with it a number of complex health problems, including childhood obesity, the threat of pandemic influenza, limited healthcare access and quality, and questions regarding vaccine and drug safety. When developing policies and strategies for coping with these challenges, the nation often turns to the Institute of Medicine (IOM) of the National Academies for advice. Since 1970, when it was created as part of the congressionally chartered National Academy of Sciences, the IOM has functioned as a unique, independent source of unbiased, evidence-based, and authoritative information on matters involving medicine and public health. Through its work, the IOM serves as an advisor to the nation in its endeavor to improve health.

Background

In 1863, President Abraham Lincoln signed the congressional charter that created the National Academy of Sciences, a nongovernmental institution with two aims: to honor top scientists through membership and to investigate, examine, experiment, and report on any subject of science or technology whenever called on to do so by any department of the government.

Since its inception, the Academy has grown to include four distinguished organizations: the National Academy of Sciences, the National Research Council, the National Academy of Engineering, and the IOM. Now known collectively as the National Academies, these four organizations perform unparalleled public service by bringing together experts in all areas of scientific and technological endeavor. These organizations draw on leading national and international experts, both elected members and others, who serve as volunteers without compensation.

The Institute's Work

The IOM provides health-related policy advice in several different forms: written reports reflecting the consensus reached by an expert study committee, symposia and convocations engaging large audiences in the discussion of national issues, summaries and proceedings from conferences and workshops, or "white papers" on policy issues of special interest. Key activities include consensus studies, convening activities, and fellowships.

Consensus Studies

The majority of the institute's work centers on rigorously reviewed consensus studies. Consensus studies are conducted by committees whose members serve without compensation. Each committee's report is subject to rigorous peer review, and all are made public. Consensus studies are managed by one of eight oversight boards of the institute. Depending on the statement of task for the project, studies may be narrow in scope, designed to answer very specific and technical questions, or they may be broad-based examinations that span myriad academic disciplines, industries, and even international borders.

Federal agencies are the primary financial sponsors of consensus studies. However, additional studies are funded by state agencies, foundations, other private sponsors, and the institute itself. The institute provides independent advice; the external sponsors have no control over the conduct of a study once the statement of task and budget are finalized. Study committees gather information from many sources in public meetings, but they carry out their deliberations in private to avoid political, special interest or sponsor influence.

Through this careful study process, the IOM produces approximately 40 reports each year. Many of the reports influence policy decisions; some are instrumental in enabling new research programs; others provide program reviews. The institute may also conduct dissemination workshops to discuss the conclusions and recommendations made by certain committees. Recent institute studies include examinations of the U.S. Food and Drug Administration's role in monitoring and improving drug safety, the recent progress made by obesity prevention initiatives, and ways to reduce

the incidence and cost of medication errors in the nation.

Convening Activities

In addition to its consensus studies, the institute strives to stimulate candid, evidence-based dialogue about key issues through workshops, roundtables, and forums. These convening activities allow government, industry, academic, and other representatives to meet and confer privately on subject areas of mutual interest. These meetings may inform the members about critical issues or provide an opportunity to plan formal institute committee studies. Examples of forums and roundtables include the National Cancer Policy Forum, the Forum on Neuroscience and Nervous System Disorders, the Roundtable on Health Literacy, and the Roundtable on Environmental Health Sciences, Research, and Medicine.

Fellowships

The IOM also advances the field of health services research by hosting three fellowship programs. The Robert Wood Johnson Health Policy Fellowship Program provides an opportunity for outstanding midcareer health professionals to gain an understanding of the health policy process, contribute to the formulation of new policies and programs, and develop in their careers as leaders in academic health centers and in health policy.

The institute's Anniversary Fellows Program provides early-career biological, social, and clinical scientists the opportunity to actively participate in the institute's work. During this 2-year fellowship, the fellows continue their work at their main academic posts while being assigned to a board of the institute. Fellows also participate actively in the work of an appropriate expert study committee or roundtable, including contributing to its reports or other products.

The Distinguished Nurse Scholar Program aims to assist nurses in playing a more prominent role in health policy at the national level. While in the program, each scholar is asked to produce a policy-oriented paper or become actively involved in the institute's work, relevant to his or her area of expertise.

The Institute's Members

The IOM's members are elected on the basis of their professional achievements. By becoming members, these experts commit to serving the institute, without compensation, through a number of different avenues, including (a) serving on a study committee, board, roundtable, or forum; (b) participating in a workshop or expert-level meeting; (c) taking part in an interest group; (d) serving on the institute's council; or (e) reviewing or coordinating reports.

The bylaws of the institute specify that no more than 65 new members and 5 foreign associates shall be elected annually. The announcement of newly elected members occurs at the institute's annual meeting in October. The number of regular members plus foreign associates and emeritus members is currently about 1,500.

An unusual diversity of talent among institute members is ensured by the charter stipulation that at least one quarter of its members be selected from outside the health professions, from fields such as the natural, social, and behavioral sciences, as well as law, administration, engineering, and the humanities.

The IOM is governed by the institute's council, which consists of the council president and 20 members elected to 3-year terms. The council provides policy guidance in addition to approving the annual program plan and fiscal-year budget. All proposals for new and revised projects are reviewed and approved by the 5-member executive committee of the council.

The Study Process

The consensus reports of the institute are viewed as being valuable and credible because of the institution's reputation for providing independent, objective, and evidence-based advice, with high standards of scientific and technical quality. Checks and balances are applied at every step in the process to protect the integrity of the reports and to maintain public confidence in them. The study process consists of four major stages: (1) defining the study; (2) committee selection and approval; (3) committee meetings, information gathering, deliberations, and drafting of the report; and (4) report review.

Stage 1: Defining the Study

Before the committee selection process begins, the institute's staff and members of their boards work with sponsors to determine the specific set of questions to be addressed by the study in a formal "statement of task," as well as the duration and cost of the study. The statement of task defines the scope of the study, and it serves as the basis for determining the expertise and the balance of perspectives needed on the committee. The statement of task, work plan, and budget must be approved by the executive committee of the institute's council and by the governing board of the National Research Council.

Stage 2: Committee Selection and Approval

Selection of appropriate committee members is essential for the success of a study. All committee members serve as individual experts, not as representatives of organizations or interest groups. Each member is expected to contribute to the project on the basis of his or her own expertise and good judgment. A committee is not finally approved until a thorough balance and conflict-of-interest discussion is held at the first meeting and any issues raised in that discussion or by the public are investigated and addressed.

Careful steps are taken to convene committees that meet the following criteria: an appropriate range of expertise for the task, a balance of perspectives, screening for conflicts of interest, and other considerations. The committee must include experts with the specific expertise and experience needed to address the study's statement of task. One of the strengths of the institute is its tradition of bringing together recognized experts from diverse disciplines and backgrounds, who might not otherwise have been able to collaborate. These diverse groups are encouraged to conceive new ways of thinking about a problem.

Merely having the right expertise is not sufficient for success. It is also essential to evaluate the overall composition of the committee in terms of different experiences and perspectives. The goal is to ensure that the relevant points of view are, in the institute's judgment, reasonably balanced, so that the committee can carry out its charge objectively and credibly.

All provisional committee members are screened in writing and in a confidential group discussion about possible conflicts of interest. For this purpose, a conflict of interest means any financial or other interest that conflicts with the service of the individual, because it could significantly impair his or her objectivity or could create an unfair competitive advantage for any person or organization. The term *conflict of interest* means something more than just individual bias. There must be an interest, often financial, that could be directly affected by the work of the committee. Except for those rare situations in which the institute determines that a conflict of interest is unavoidable and promptly and publicly discloses it, no individual can be appointed to serve on a committee of the institute used in the development of reports if the individual has a conflict of interest that is relevant to the functions to be performed.

Membership in the IOM and previous involvement in National Academies studies are taken into account in committee selection. The inclusion of women, minorities, and young professionals is an additional consideration.

Stage 3: Information Gathering and Drafting of the Report

Study committees, typically, gather information through meetings that are open to the public and announced in advance through the institute's Web site, submission of information by outside parties, reviews of the scientific literature, and investigations of the committee members and staff. In all cases, efforts are made to solicit input from individuals who have been directly involved in or who have special knowledge of the problem under consideration.

In accordance with federal law and with few exceptions, information-gathering meetings of the committee are open to the public, and any written materials provided to the committee by individuals who are not officials, agents, or employees of the institute are maintained in a public access file that is available for examination.

The committee deliberates in meetings, closed to the public, to develop draft findings and recommendations free from outside influences. The public is provided with brief summaries of these meetings that include the list of committee members

present. All analyses and drafts of the report remain confidential.

Stage 4: Report Review

As a final check on the quality and objectivity of the study, all IOM reports—whether products of studies, summaries of workshop proceedings, or other documents—must undergo a rigorous, independent external review by experts, whose comments are provided anonymously to the committee members. The institute recruits independent experts with a range of views and perspectives to review and comment on the draft report prepared by the committee.

The review process is structured to ensure that each report addresses its approved study charge and does not go beyond it, that the findings are supported by the scientific evidence and arguments presented, that the exposition and organization are effective, and that the report is impartial and objective.

Each committee must respond to, but does not need to agree with, reviewer comments in a detailed “response to review.” If the reviewer comments are not agreed with and incorporated, the committee must explain clearly its reasons for disagreeing. The response to review is examined by independent report review monitors responsible for ensuring that the report review criteria have been satisfied. After the report has cleared review and all the committee members have signed off on the final report, it is transmitted to the sponsor of the study and is released to the public. The National Academies retains the copyright to all its products. Sponsors are not given an opportunity to suggest changes in reports. The names and affiliations of the report reviewers are made public when the report is released.

Bethany Hardy

See also Access to Healthcare; Cost of Healthcare; Medical Errors; Public Health; Public Policy; Quality of Healthcare; Uninsured Individuals

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Web Sites

Institute of Medicine (IOM): <http://www.iom.edu>

National Academies: <http://www.nationalacademies.org>

National Academies Press: <http://www.nap.edu>

INTENSIVE-CARE UNITS

Intensive-care units (ICUs) are specialized units within hospitals that are designed to provide care for critically ill or injured patients. ICUs, typically, have specialized medical equipment and staff to provide continuous care to patients 24 hours a day, 7 days a week. The units also generally have the ability to monitor patients’ cardiovascular, respiratory, and renal functions as well as neurological status. The establishment of ICUs has made care for the sickest patients possible through the use of these advanced medical technologies. Some hospitals maintain multiple ICUs, each designed to handle specific conditions or age groups. For example, neonatal intensive-care units (NICUs) care for infants, pediatric intensive-care units (PICUs) care for children, and cardiac-care units (CCUs) care for heart attack patients. A burn unit in a hospital is also considered an ICU, or a critical-care unit. Patients who may benefit from intensive care include heart attack and stroke patients, victims of multiple trauma or disasters, individuals who require mechanical ventilation, and complicated-surgery patients.

The design of the ICU allows medical staff to monitor their patients closely. Many ICUs are designed so that physicians and nurses can see the patients at all times, either with a direct line of sight or through the use of video monitors. The floor plans dictate adequate traffic flow and use of workspace.

The specialized work that occurs in ICUs saves many lives each year. Healthcare professionals in the ICU possess advanced medical skills that allow them to care for critically ill and injured patients. In addition to providing specialized medical care, ICU staff must be prepared to communicate effectively with family members and support end-of-life decisions.

Overview

The concept behind ICUs has a long history. Florence Nightingale (1820–1910), while serving as a nurse during the Crimean War, separated out the severely injured soldiers from those with minor injury or illness; this practice of triaging allowed the nurses to monitor the seriously wounded patients more closely. During the polio epidemic in the 1940s and 1950s, patients required continuous surveillance and assistance. As a result, many specialized units were established at hospitals to provide these patients with the appropriate care they needed. William Mosenthal, a surgeon at Mary Hitchcock Memorial Hospital in Lebanon, New Hampshire, is credited with establishing the first ICU in the United States (in 1955) that coordinated nursing care and the use of medical equipment in one place for critically ill patients. Today, ICUs are the standard of care for patients with life-threatening diseases and injuries.

Medical Team

The ICU medical team is composed of clinicians from a variety of disciplines, including physicians, nurses, respiratory therapists, pharmacists, and other allied health professionals. These staff members work together to provide advanced medical care to patients. The medical team receives advanced training and possesses specialized skills to care for critically ill patients.

Intensive-care specialists, called intensivists, are board certified in a specialized area, such as surgery or internal medicine, and they have received

additional training and certification in critical care. While open ICUs allow for any attending physician with admitting privileges at the hospital to serve as the physician of record and to direct the patient's care, closed ICUs require that an intensivist serve as the physician of record.

ICU nurses, known as critical-care nurses, also play an important role in patient services and the delivery of care. Often, two nurses staff a single patient in the ICU. This ratio enables the nurses to keep a close watch on patients, and often, they serve as the primary contact with the patient's family. Experienced ICU nurses are able to recognize changes in patient conditions and respond quickly by alerting the attending physician.

Medical Equipment

Typical medical equipment found in ICUs includes monitors, tubes, and ventilators. Monitors are designed to measure a patient's vital functions, such as heart rate, blood pressure, oxygen saturation, and respiration. Intravenous lines (IVs) provide medicine, fluids, and nutrition through a patient's veins; urinary catheters remove urine from the patient's bladder; and nasogastric (NG) tubes, which can be inserted into the patient's nostrils and through the back of the throat into the esophagus and stomach, provide nutrition. Respirators, or ventilators, assist a patient's breathing with the insertion of a tube through the mouth or nose and into the patient's windpipe.

Patients and Medical Conditions

Patients are usually admitted to the ICU from other units within the hospital, such as the emergency department or surgical areas. For example, once trauma patients are stabilized in the emergency department, they are sent to the ICU for advanced care. Surgical patients may be sent to the ICU for care and recovery if an advanced or critical surgery has been performed or if the patient experiences complications following the operation. Critical illnesses such as heart attacks, poisoning, and pneumonia are other examples of conditions that may lead to admission to an ICU.

Many ICU patients require special assistance with bodily functions as a result of severe respiratory disease. Conditions such as chronic obstructive

pulmonary disease (COPD) or pneumonia weaken the lungs, and patients admitted with these conditions often require assistance with breathing.

Once admitted to the ICU, the risk of developing other problems increases for the patient. Infections may develop as the patient's immune system may be in a weakened state due to an existing illness. Common infections in ICU patients include blood infections due to IVs and urinary tract infections (UTIs) due to urinary catheters. Antibiotics and/or the removal of the tubes may be necessary to treat these infections.

Many patients require sedation so that they do not try to remove the tubes or other equipment. Heavy sedation slows a patient's natural physiologic breathing mechanism and may lead to the use of intubation and ventilators, and may slow the patient's recovery.

ICU patients are also at risk of organ failure. Patients may be admitted with problems in one area of their body, but if recovery is slow, other organs and bodily functions may be affected.

Life Support and End-of-Life Issues

Decisions about life support and end-of-life issues are not uncommon for ICU patients and their families, as patients present with life-threatening illnesses. Medical teams and families often face decisions about when to turn off life support. End-of-life issues may arise after a long-term effort to prolong the patient's life indicates no hope for recovery, or they can emerge quickly following the rapid deterioration of the patient's health. Physicians may face ethical decisions about ending a patient's suffering or abiding by the family's wishes.

ICU staff work within the scope of both curative care and palliative care. Curative care refers to the effort to do everything possible to assist the patient's recovery. Palliative care refers to the effort to make the patient as comfortable as possible and allow death to occur naturally.

Kristin Hartsaw

See also Acute and Chronic Diseases; Emergency Medical Services (EMS); Hospital Emergency Departments; Hospitalists; Hospitals; Nightingale, Florence; Nurses; Physicians

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Web Sites

- American Academy of Emergency Medicine (AAEM):
<http://www.aaem.org>
- American Association of Critical Care Nurses (AACN):
<http://www.aacn.org>
- Society of Critical Care Medicine (SCCM):
<http://www.sccm.org/Pages/default.aspx>

INTERMEDIATE-CARE FACILITIES (ICFs)

Intermediate-care facilities (ICFs) are a type of care facility for individuals such as the elderly, not acutely ill, mentally ill, or disabled, who are not able to live independently but do not require constant care. Thus, ICFs provide services to patients with health conditions that do not necessarily require hospitalization or skilled nursing care but present a need for subacute care. Intermediate care is generally provided to patients who are medically stable but are not stable enough to be treated in other healthcare settings such as in a long-term care facility, at home, or on an outpatient basis. ICFs are generally a location for patient recuperation or

rehabilitation following an acute episode or a place for the chronically ill to receive care to avoid inappropriate hospitalizations.

The term *intermediate care* implies that the care is provided on a transitional basis, as if moving from one level of care to another. Therefore, intermediate care may refer to the services provided to the patient during the transition stage between hospitalization and home and from needing acute medical attention to being functionally independent. Patients of ICFs generally receive 24-hour care from a multidisciplinary team of health professionals. Some ICFs may resemble nursing homes, providing services in a residential setting, while others may also care for the elderly. ICFs may offer medical, social, and support services to patients; however, the focus of these facilities is on rehabilitating individuals so that they are able to regain the functions of independent daily living and return to a home setting.

Although there are ICFs that treat people with various health conditions, including the acutely and chronically ill, this entry focuses on ICFs for people with mental illness and developmental delays. ICFs for the Mentally Retarded (ICF/MR) in the United States are certified by the Centers for Medicare and Medicaid Services (CMS) and state Medicaid programs. The care provided at these facilities is an optional benefit for Medicaid clients who qualify. The program was originally established in 1971 as a result of federal legislation.

Overview

When a patient is referred to an ICF/MR facility, the ICF/MR team diagnoses the conditions, manages treatment, and offers rehabilitative services for mentally retarded and developmentally disabled individuals. The ICF/MR services are provided in a safe environment and aim to assist individuals in reaching their full potential. Most of the ICF/MR facilities are designed as group homes, serving anywhere from 4 to 15 individuals at a time. Originally, these facilities served larger numbers of clients, with residential populations of up to 200 or more. Smaller-sized facilities, however, allow for more individualized attention and increased quality of care. The majority of ICF/MR facilities are privately operated as state governments have closed many publicly operated ICF/MR facilities over the

past few decades. These facilities serve residents with severe mental retardation or developmental disabilities, in contrast to clients accessing other types of residential programs.

ICF/MR facilities must meet specific guidelines to receive Medicaid reimbursement and maintain their certification. Facilities must be licensed according to state and local law, and they must maintain specific staff-to-resident ratios, depending on the severity of client conditions. Those ICF/MR institutions serving residents with severe physical disabilities or clients who exhibit combative or psychotic behavior must have a staff-to-client ratio of 1 to 3.2. When working with clients who have moderate retardation, the staff-to-client ratio should be 1 to 4. Guidelines require that the staff-to-client ratio must be 1 to 6.4 for facilities that serve clients with mild retardation.

ICF/MR facilities maintain a safe and therapeutic environment that allows some client independence, depending on the client's level of functionality. They offer clients protection against verbal, psychological, and physical abuse. Facilities also provide healthcare and rehabilitation services. Adult day care programs, which provide outside services, are allowed at facilities as long as the programs meet Medicaid requirements and the particular needs of the client.

The Medicaid guidelines for ICF/MR advocate respect and dignity for clients. Facilities are required to provide staff training that addresses behavior, appropriate interventions, and positive reinforcement in delivery of care. Staff must be able to safely address unacceptable client behavior.

Professionals from several disciplines serve clients residing in these group settings. This diverse staff is responsible for assessing and evaluating clients and developing interventions that best serve their needs.

Medicaid requires that ICF/MR facilities coordinate Active Treatment Services for clients, which provide skills-based training for residents who demonstrate increased abilities in areas such as communication, household tasks, and other basic skills. Daily supervision is required for individuals receiving Active Treatment Services. This type of treatment is provided on a formal and informal basis through the client's settings and services. Active treatment may also be used with the aging population to address issues such as physical

fitness and coordination. It is the defining component for ICF/MR certification.

ICF/MR staff must develop individual program plans for each client. In addition to completing assessments and evaluations, staff may work with other team members and partner agencies to best meet the needs of the client. Identification of the clients' specific diagnoses, developmental strengths, developmental and behavioral management needs, and skill deficits contributes to the scope of an individual program plan.

ICF/MR care facilities must also address benchmarks related to clients' physical development and health, nutritional status, motor skills and development, emotional development, speech and language skills, and hearing. These facilities also must address problem-solving and social skills with clients. Other activities include job skills training and independent living.

Medicaid requires that facilities maintain written policies, procedures, and guidelines that deal with client and staff interaction and the management of inappropriate client behavior. Staff interactions with clients should be positive and should contribute to the client's personal growth. Staff communication should also allow for decision-making skill development with the clients. Additionally, the staff must know how to safely deal with clients that act out, teaching residents acceptable and unacceptable behavior. Written policies must detail all methods of intervention for inappropriate behaviors, starting with the least intrusive approach. Examples of interventions include time-out rooms, physical restraints, and medication.

ICF/MR facilities also provide nursing services, dental care, and pharmacy services. All services are documented for quality assurance purposes. Medicaid sends surveyors to certified facilities in order to ensure compliance with specified standards and maintain quality of care.

Future Implications

ICFs will likely continue to remain an important part of the healthcare delivery system for individuals with health conditions that require subacute care. ICFs for the mentally retarded, in particular, provide ongoing care in a residential setting that promotes the health and personal development of its clients. A multidisciplinary approach is offered

to clients to meet their needs through an individualized approach.

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See also Acute and Chronic Diseases; Case Management; Disability; Long-Term Care; Medicaid; Mental Health; Nursing Homes; Skilled-Nursing Facilities

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<http://www.cms.hhs.gov>
- Henry J. Kaiser Family Foundation (KFF):
<http://www.kff.org>

INTERNATIONAL CLASSIFICATION FOR PATIENT SAFETY (ICPS)

Established by the World Health Organization (WHO), the International Classification for Patient Safety (ICPS) strives to improve the quality and safety of healthcare. The ICPS aims to define, harmonize, and group patient safety concepts into an internationally agreed-on classification system

that strives for maximum comparability on a global level. By its design, the ICPS is constantly changing to incorporate new language and updated classification schemes. Currently, the ICPS is only available for field-testing purposes, which is being conducted by the Joint Commission. This entry describes the development and theoretical concepts underlying the ICPS system.

Background

In 2002, the WHO's World Health Assembly adopted Resolution WHA55.18, which called for strengthened efforts to address patient safety and quality of care. Recognizing that all WHO member states faced similar challenges, the WHO established the World Alliance for Patient Safety (World Alliance) in 2004. One of the World Alliance's key goals was to develop a standardized language for patient safety in order to provide member states with a common terminology, based on universally understood meanings, to enable them to share and learn from each other's experiences. In 2005, the World Alliance brought together 13 international experts with academic and practical experience in patient safety, research methodology, classification theory, human factors engineering, health informatics, medicine, and consumer advocacy and law, and this drafting group was charged with developing the ICPS.

At its inception, the most vital purpose for developing the ICPS was to enable the evaluation of patient safety from a systems approach and enhance learning not only from patient safety incidents that caused harm to patients but also from those incidents that did not result in harm. These types of incidents are known as adverse events and near misses, respectively. Developing strategies that reduce the risk of harm depends on identifying the factors that contribute to the occurrence of patient safety incidents and the factors that prevent a near miss from becoming an adverse event. To accomplish this, information is collected through disparate systems, including reporting systems, root cause analyses, medical record reviews, consumer or patient reporting, coroner's reports, and medical law cases. These data are then translated into a standardized classification to permit systematic collection, aggregation, examination, education, and ultimately reduction of risk.

Members of the drafting group reviewed the literature and identified the existing patient safety classifications to determine whether an existing system could serve as a starting point for the development of the ICPS. These classifications, however, were developed to address specific aspects of patient safety, such as medication use; they were not designed for the overall domain of patient safety. Because they evolved using different methodologies with dissimilar definitions for concepts, the drafting group determined that these existing methods were not independently fit for global use. Instead, the group decided to construct a new classification based on sound classificatory theory and the experiences of others, including the WHO's International Classification of Diseases; the Joint Commission's Patient Safety Event Taxonomy, endorsed by the National Quality Forum (NQF); and the National Patient Safety Foundation's National Reporting and Learning System of the United Kingdom's National Health Service. The Australian Patient Safety Foundation's Advanced Information Management System and the Eindhoven/PRISMA-Medical Classification Model, developed by Eindhoven University of Technology and Leiden University Medical Center in the Netherlands, were also considered.

Structure and Theoretical Framework

The ICPS was designed to be a flexible descriptive tool that could become a basic foundational element for global learning. Therefore, its construction had to be firmly grounded in classificatory theory and its underlying infrastructure stable and reliable. The classification concepts, or bearers of meaning identified by labels or terms, are arranged into classes or groups based on their similarities to express semantic and attribute-type relationships. The concepts and the relationships between and among them are easily identifiable and separated without difficulty for analysis. New concepts can be incorporated as knowledge in the field of patient safety increases, which allows it to be applicable across disciplines, boundaries, and time. Furthermore, the classification must remain culturally and linguistically sensitive. With this type of infrastructure, the classification can mature, respond to change, maintain predictive capability, and enable learning. To construct a

classification such as this, the ICPS's structure needed a proactive, logical, and relational conceptual framework to serve as its foundation.

In March 2006, the drafting group identified 10 concepts that would serve as the fundamental classes for the ICPS: (1) incident type, (2) patient outcomes, (3) contributing factors/hazards, (4) patient characteristics, (5) incident characteristics, (6) organizational outcomes, (7) detection, (8) mitigating factors, (9) ameliorating actions, and (10) actions to reduce risk. The drafting group then devised a theoretical model of the interrelationships between the classes, based on the theories underlying James Reason's "Swiss cheese model," to understand how the classes influence each other and to determine how the classes should be arranged within the conceptual framework to achieve the project's stated outcome of developing a stable ICPS.

According to Reason, there are two types of approaches to evaluating the occurrence of a patient safety incident. One is the person approach, where the incident is the result of an individual person making a mistake. The other is a systems approach, where the incident is the result of a failure within the system. Reason argues that because individuals are fallible, the system must contain multilayered processes, referred to as defenses or barriers, to protect against the occurrence of patient safety incidents. Their purpose is to avert or reduce the risk of harm by either being built into the system from the start or arising on an ad hoc basis. Using Swiss cheese as a metaphor, the presence of a hole in any one defensive layer does not necessarily mean that a patient safety incident will occur; however, when the holes in several defensive layers align as a result of a combination of active failures and latent conditions, a contributing factor/hazard can move, uninhibited, to become a patient safety incident. Reason postulates that latent conditions can be detected and mitigated before an incident occurs through proactive risk assessment or other error recovery methods. Being able to proactively identify risks and design system approaches to counteract these risks illustrates a system's ability to be resilient.

Applying Reason's theory to the ICPS, once the active failure and latent condition have collided, the system should have the ability to detect the problem and to institute mitigating factors that have the potential to stop the progression toward

a system failure; however, latent and active contributing factors/hazards continuously interact. The drafting group referred to this period as an opportunity to protect against system failure. Once the failure has occurred, and although both latent and active contributing factors/hazards remain, there is still an opportunity for detection and mitigation. If the system defenses or an individual is unable to recover from the error, the patient safety incident occurs. It is at this point that the opportunity to protect against harm exists. A patient safety incident results in a patient outcome and an organizational outcome and possesses patient characteristics and incident characteristics (who was involved and what occurred). The patient outcome can be either an adverse event or a near miss. Both patient outcomes and organizational outcomes require actions to ameliorate circumstances and compensate for any harm after a patient safety incident. Actions taken to reduce risk serve to lessen, manage, or control the harm or probability of harm associated with the patient safety incident. These actions, including proactive and reactive risk assessment, address the issue that allowed the contributing factor/hazard to progress into a patient safety incident. They relate directly to contributing factors/hazards, detection, mitigating factors, and ameliorating actions and can be implemented anytime, not only after a patient safety incident has transpired. Thus, the process is a continuous learning loop.

To illustrate this theoretical model, consider the following example: a 55-year-old man presented to a busy, understaffed hospital emergency department with a fever. Although a resident took a brief medical history, during which the patient indicated an allergy to penicillin, the allergy to medication was not documented in the patient's chart. This negligence is considered a failure of protection. Continuing with this example, the attending emergency physician reviewed the chart, ordered amoxicillin, and administered it for treatment. The patient then experienced a mild allergic reaction to the medication. This adverse drug event is considered a patient safety incident. Because the patient experienced only a mild reaction, observation was ordered to monitor for any further complication. After an investigation of the patient safety incident, through a root cause analysis or other investigatory process, hospital

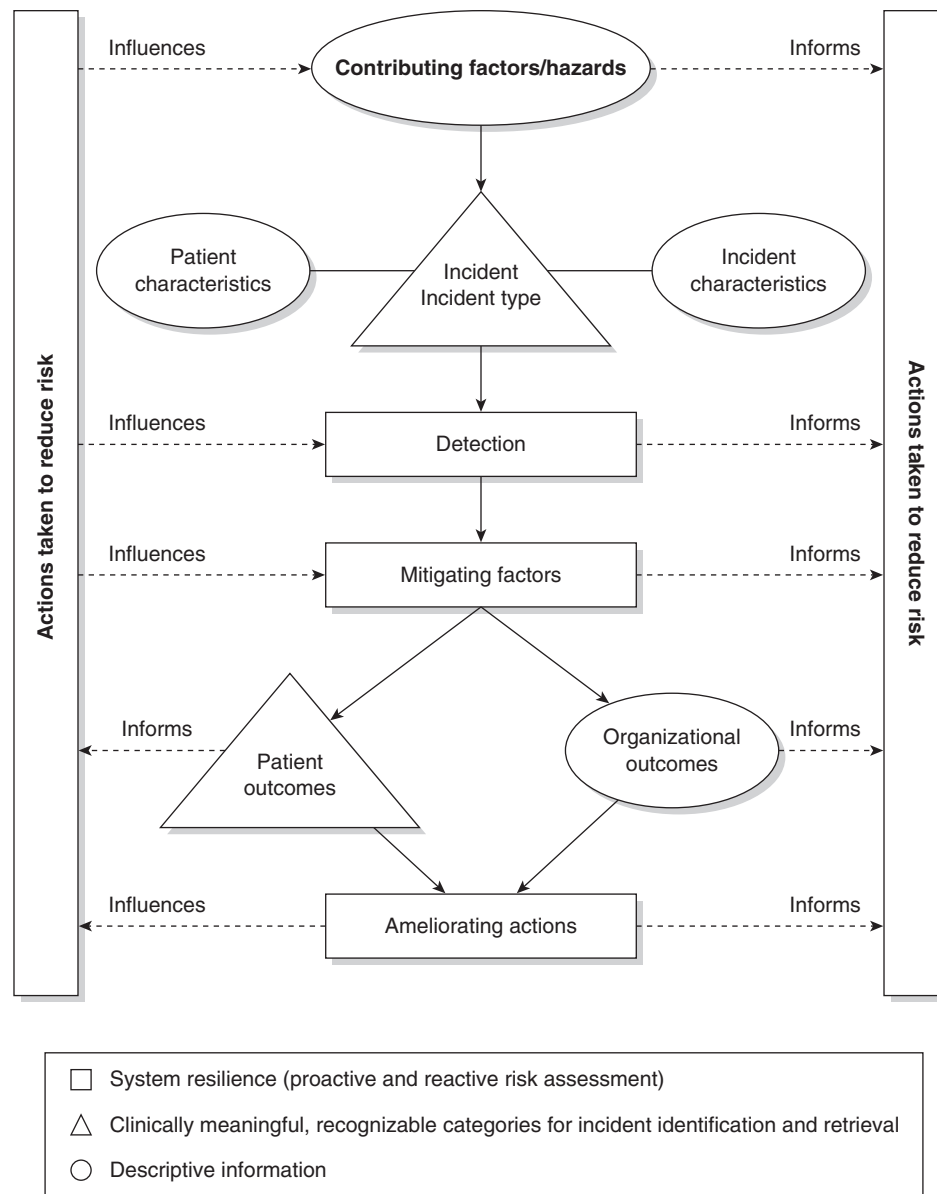


Figure 1 Conceptual Framework for the International Classification for Patient Safety

Source: The World Health Organization, World Alliance for Patient Safety (<http://www.who.int/patientsafety/taxonomy/en>), Geneva, Switzerland.

policy, staffing, and education requirements were reviewed in an effort to reduce risk.

The depiction of the ICPS’s conceptual framework must represent this theoretical flow of ideas in a logical and operational manner if it is to easily map, with relatively low resource expenditure, to existing reporting systems, in addition to being a tool to organize patient safety data and information in a structured classification. Consequently,

the conceptual framework is depicted in a manner that maintains its stability, flexibility, ability to incorporate new concepts, and predictive capacity while simultaneously enabling the creation of translational tables to map data fields contained in the existing reporting systems to those contained in the ICPS. Such a structured approach is a prerequisite for integrating disparate data and information into a common learning platform. Therefore, the

drafting group purposefully arranged the classes to visually depict the learning cycle resulting from a patient safety incident (see Figure 1). Solid lines indicate the semantic relationships between classes, and dotted lines indicate the flow of information.

An incident type is a descriptive term for a category of incidents of a common nature grouped because of shared features. A patient outcome is the impact on a patient that is either wholly or partially attributable to the incident. Together, these classes group patient safety incidents into recognizable, clinically meaningful categories.

Contributing factors/hazards are circumstances, actions, or influences that are thought to have played a part in the origin or development of an incident or in increasing the risk of an incident. Patient characteristics are the selected attributes of a patient, whereas incident characteristics are the selected attributes of an incident, and organizational outcomes are the impact on an organization that are wholly or partially attributable to an incident. Data and information pertaining to system resilience, risk reduction, protection against failure, and protection against harm are captured in the following classes: (a) detection—defined as an action or circumstance that results in the discovery of an incident; (b) mitigating factors—actions or circumstances that prevent or moderate the progression of an incident toward harming a patient; (c) ameliorating actions—actions taken or circumstances altered to make better or compensate any harm after an incident; and (d) actions to reduce risk—those actions taken to reduce, manage, or control the harm, or probability of harm, associated with an incident in order to help reduce risk. Contributing factors/hazards leading to patient safety incidents are influenced by and inform actions to reduce risk, as do concepts contained in the classes detection and mitigating factors. Patient outcomes and organizational outcomes both inform actions to reduce risk. Ameliorating actions also influence and inform actions to reduce risk.

Future Implications

The pragmatic utility of the ICPS is its ability to translate data and information collected in disparate reporting systems into a coded language so that analysis of a single concept or a combination of concepts is possible to identify trends, predict potential problem

areas, and learn from experience. The ability to organize patient safety information through an internationally accepted classification system with a solid conceptual framework is essential if patient safety incident data and information are to be used and disseminated effectively. A standardized patient safety terminology allows for semantic interoperability, making it possible to draw comparisons across sources, disciplines, organizations, borders, cultures, and time. This, in turn, enables surveillance and evaluation to identify actual and potential threats to patient safety. Policymakers can use this evidence-based research to revise existing or to introduce new system-wide solutions, assess the effectiveness of the interventions, and communicate the lessons learned globally.

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Gerard M. Castro, and Jerod Loeb*

See also Adverse Drug Events; Comparing Health Systems; International Classification of Diseases (ICD); Joint Commission; Medical Errors; Patient Safety; Quality of Healthcare; World Health Organization (WHO)

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INTERNATIONAL CLASSIFICATION OF DISEASES (ICD)

The International Classification of Diseases (ICD) is the official coding system used by all the world's nations for recording the causes of morbidity and mortality. The ICD is periodically revised, published, and disseminated by the World Health Organization (WHO). Specifically, the WHO, working with 10 Collaboration Centers, produces the ICD. The purpose of the ICD is to permit valid and reliable comparisons of morbidity and mortality data across time and nations. The ICD plays an important role in reducing the complexities of thousands of diagnoses of diseases and medical procedures to a smaller, more manageable set of standardized diagnostic and procedural codes. It is widely used by public health departments, health-care organizations, and health services researchers to analyze the general health of population groups; monitor the incidence and prevalence of diseases; and compare other health problems in relation to the access, cost, and quality of healthcare.

History

The origins of the ICD can be traced back to the 1850s, when William Farr (1807–1883), the founder of medical statistics, and others developed standardized classifications of diseases for comparative and statistical purposes. Farr, for example, classified diseases into five broad groups: (1) epidemic diseases, (2) constitutional (general) diseases, (3) local diseases arranged according to anatomical site, (4) developmental diseases, and (5) diseases that are the direct result of violence. Although Farr's structure has been modified over the years, it still forms the basis of the ICD.

Over the past 100 years, the ICD has been revised 10 times approximately each decade to incorporate changes in medicine. The 1st edition of the ICD, known as the International List of Causes of Death, was adopted by the International Statistical Institute in 1893. Until the 5th revision of the ICD, the Government of France convened the international conferences that developed the various revisions. After World War II, however, the newly created World Health Organization took over the responsibility for the ICD. In 1948, the WHO

issued the 6th revision (ICD-6), and it has developed and published all succeeding revisions. In 1955, it published the 7th revision (ICD-7). This revision was changed in the United States in 1959 to include various clinical modifications. In 1965, the WHO published the 8th revision (ICD-8), which also was modified in the United States in 1968. The WHO published the 9th revision (ICD-9) in 1977, and it also was modified, this time by the National Center for Health Statistics (NCHS), to include more morbidity data and medical procedure codes. This extension resulted in the ICD-9-CM, with the CM standing for clinical modification. The United States currently requires all the nation's hospitals to use ICD-9-CM diagnosis codes for Medicare and Medicaid claims. In 1994, the WHO released the 10th revision of the ICD (ICD-10). This revision has been adopted for reporting mortality by the NCHS and the state and local public health departments; however ICD-9-CM is still used by hospitals and other healthcare organizations for recording morbidity and for billing purposes.

Key Differences Between ICD-9-CM and ICD-10

The ICD-9-CM contains 17 chapters and two supplementary classifications. The E-Codes classify the external causes of injury and poisoning, and the V-Codes organize factors influencing health status and contact with health services. These two chapters now form part of the main classification in the 10th revision (ICD-10). Although the overall content is similar and the format and conventions of the classification remain unchanged, the ICD-10 is different from its predecessor in many ways.

The main axis for cataloging injury has changed in the injury and poisoning chapter of ICD-10. In ICD-10, injuries are catalogued first by type: All dislocations are grouped together, as are all open wounds. In ICD-10, however, the axis of organization focuses instead on the anatomical site of injury. Thus, all injuries to the foot, for example, are catalogued together, as are all injuries to the head.

The ICD-10 is published as a three-volume set compared with ICD-9-CM's two volumes. The ICD-10 has alphanumeric categories rather than numeric categories to allow sufficient space for future additions and changes without disrupting

the codes and to provide a larger coding frame. Some chapters have been rearranged. For example, certain disorders of the immune system are included with diseases of the blood and blood-forming organs, whereas in the ICD-9-CM, they are included with endocrine, nutritional, and metabolic diseases. Two new chapters have been created for diseases of the eye and adnexa and diseases of the ear and mastoid process. Some codes have been expanded, including those for diabetes, alcohol/substance abuse, and postoperative complications. The ICD-10 has a total of 21 chapters and almost twice as many categories as the ICD-9-CM.

Future Implications

Researchers at the WHO and other organizations are working on the 11th revision of the International Classification of Diseases (ICD-11). The first draft of ICD-11 is expected to be completed by 2010. The final version will likely be published around 2014 and implemented by various nations starting in 2015. It seems likely that the United States will modify ICD-11 to better suit its unique healthcare system and needs.

Rima Tawk

See also Disease; Epidemiology; Farr, William; Health Informatics; Morbidity; Mortality; Public Health; World Health Organization (WHO)

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<http://www.paho.org>

World Health Organization (WHO): <http://www.who.int>

INTERNATIONAL HEALTH ECONOMICS ASSOCIATION (iHEA)

The International Health Economics Association (iHEA) is an individual, not-for-profit membership association consisting of more than 2,500 members from 72 countries. The iHEA focuses on the collegueship and advancement of individual health economics scholars, students, and researchers. Specifically, the goals of the iHEA are to increase communication among health economists across the globe, foster a higher standard of debate in the application of economics to health and to healthcare systems, and assist young health economists conduct high-quality research at the start of their careers.

Background

Although as early as the 1920s economists began getting together to review each other's work in the area of health and to trade ideas on the subject, there was no formal field of health economics for many decades. One of the first organizations in the field was the Health Economics Study Group (HESG), which was established in the early 1970s in the United Kingdom. Two prominent health economists, Joseph P. Newhouse in the United States and Anthony J. Culyer in the United Kingdom, began the *Journal of Health Economics* in 1981. Thus, by the 1980s, the new field of health economics was clearly established.

Over the years, various regional and national health economics associations were started, many of those in Europe and Anglophone countries following the HESG model. In the United States, a health economics committee was created as part of the medical-care section with the American Public Health Association (APHA), and a sectional affiliate was established in the American Economic Association (AEA), but neither of these entities grew into membership organizations. There were

discussions among health economists about the need for creating an international membership society to encourage communication among health economists, and in 1994, the iHEA was established. Its founding directors included Thomas E. Getzen, Charles Hall, Alan Maynard, Michael A. Morrissey, Joseph P. Newhouse, and Mark V. Pauly. Getzen was the executive director and served as the association's first president, followed by Newhouse, Maynard, and then Pauly.

The association has grown over the years. However, eventually it was recognized that for it to be truly international in scope and not just representative of developed industrial countries, the iHEA would have to seek external funding for members of developing countries. It also recognized that the lack of an active American health economics organization was distorting the membership, and in 2003, the board voted to create the American Society of Health Economists (ASHE) as a subcommittee of the iHEA to provide a more appropriate venue for North American conferences and communications. The ASHE will continue to be a subentity within the iHEA until 2010, and then it will become an independent organization.

Funding and Organizational Structure

The iHEA is largely self-funded through individual dues and fees, which helps it to maintain independence from the specific interests of industry, government agencies, or medical organizations.

Its organizational structure consists of the following: (a) an executive director; (b) a president, who is elected by the membership; (c) a secretary/treasurer; (d) a board of directors; (e) program chairs, for the biennial meeting; and (f) the association's operational staff, which consists of three individuals. Members of the board of directors serve 4-year overlapping terms.

Main Activities

The association's main activities include (a) presenting the annual Kenneth J. Arrow Award in Health Economics for the best published paper in health economics; (b) distributing health-economics-related journals to its members at a discounted price; (c) distributing health-economics-related information

to its members, including a weekly online newsletter; (d) maintaining a world directory of health economists; and (e) conducting a large biennial international conference on health economics.

To be eligible for the association's annual Kenneth J. Arrow Award in Health Economics, a paper must have been published in a peer-reviewed journal in English in the year of the award. Members submit nominations and a copy of the paper to a reviewing committee, who pick the winning paper.

The association provides members with discounts on six journals: (1) *Health Economics*, (2) *Journal of Health Economics*, (3) *European Journal of Health Economics*, (4) *Economics and Human Biology*, (5) *International Journal of Healthcare Finance and Economics*, and (6) *Journal of Mental Health Policy and Economics*.

The world directory of health economists maintained by the association includes information on about 2,300 individuals. It includes the name of the individual and his or her e-mail address, organization/department, and telephone number.

The association's biennial conference is a major international event, and the number of attendees has steadily grown over time. The first conference, called the "iHEA Congress," was held in Vancouver, British Columbia, Canada, in 1996. Subsequent conferences were held in Rotterdam, Holland, in 1999; York, England, in 2001; San Francisco, California, in 2003; Barcelona, Spain, in 2005; and Copenhagen, Denmark, in 2007. The association's 2009 World Congress will be held in Beijing, China.

Thomas E. Getzen

See also American Society of Health Economists (ASHE); Arrow, Kenneth J.; Committee on the Costs of Medical Care (CCMC); Comparing Health Systems; Cost of Healthcare; Health Economics; International Health Systems

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<http://www.healthconomics.org>

INTERNATIONAL HEALTH SYSTEMS

Over the past several years, there has been a growing interest in comparing the healthcare systems of various nations. This interest is primarily a result of searches by governments and citizens alike for new solutions to offset increasing healthcare costs. A key element in comparing various national healthcare systems is how they pay for care. Nations generally pay for healthcare through individual out-of-pocket payments, individual private health insurance, employment-based private health insurance, or government financing. In most nations of the world, healthcare is delivered and/or financed by the public sector. In others, such as the United States, most people both pay for and receive their care through the private sector. The United States is unique among nations because it views healthcare not as a public good but rather as a private good that is available to those who can afford to pay for it.

To put the U.S. healthcare system in an international context, two countries—Germany and Canada—are compared. These two countries exemplify healthcare systems different from the private model in the United States. That is, Germany and Canada both provide financial access to healthcare through government-run or government-mandated programs.

German Healthcare System

Germany was the first nation to enact compulsory health insurance legislation in 1883. The law required employers and employees to make payments to voluntary "sickness funds," which would pay for the covered employees' medical care. Initially, only industrial wage earners with incomes less than \$500 per year were included. However, the eligible population was extended in later years.

Today, about 90% of Germans receive their health insurance through the mandatory sickness funds. There are about 500 of these funds, and the majority of individuals remain in one of the funds throughout their life. About 40% of people belong to funds organized by geographic area. About 27% (primarily families of white-collar workers) belong to "substitute" funds, 12% belong to the sickness funds of their companies, and another 12% belong to craft-based funds. About 8% of Germans (mainly those with higher incomes) choose private insurance, and another 2% receive medical services as members of the armed forces. Less than 0.2% of the population has no coverage.

The sickness funds are quasi-public/quasi-private not-for-profit ventures that collect money from members and members' employers. Unlike managed-care organizations in the United States, the funds are not allowed to exclude people due to illness or to raise contribution rates according to age or medical conditions. The funds are required to cover a broad range of benefits, including hospital and physician services; prescription drugs; and dental, preventive, and maternity care. Copayments for care are modest, and on retirement or loss of a job, people and their families retain membership of their sickness fund.

German medicine maintains a strict separation of ambulatory-care physicians and hospital-based physicians. Most ambulatory-care physicians are prohibited from treating patients in hospitals, and most hospital-based physicians do not have private offices for treating outpatients. Traditionally, patients could go directly to an ambulatory-care specialist. However, in recent years, referrals from the patients' primary-care physician to ambulatory-care specialists have become the norm. The German system of dispersed medical-care organization is similar to that in the United States, with little

coordination between ambulatory-care physicians and hospitals.

Controlling healthcare costs has been a problem in Germany in recent years but not to the extent it is in the United States. Negotiations on fees, rates, and prices for care are conducted annually at state, regional, and local levels between the sickness funds, physicians' associations, and hospitals. Today, healthcare costs in Germany are about 10% of its gross domestic product (GDP).

To control costs, Germany has accentuated competition into its insurance system by allowing individuals greater flexibility in choosing a sickness fund. The expectation is that individuals will seek out lower-cost funds and that this consumer choice model will motivate all funds to become more price competitive. However, Germans have shown much allegiance to their sickness funds, and switching behavior has been limited. Overall, the German values of social solidarity and fairness have dampened aggressive price competition and shopping for health plans.

Canadian Healthcare System

In 1947, Saskatchewan was the first Canadian province to initiate a publicly financed universal hospital insurance. Other provinces followed, leading to the Canadian Hospital Insurance Act in 1957 and its full implementation in 1961. Saskatchewan again took the lead in 1961 by enacting a medical insurance plan for physician services. All Canadian provinces covered physician services by 1971, giving Canada a province-based, tax-financed, public, single-payer healthcare system.

Canada, unlike Germany and the United States, has severed the link between employment and health insurance. Wealthy or poor, employed or jobless, retired or under age 18, every Canadian receives the same health insurance, financed in the same manner. Furthermore, the benefits provided by the Canadian provinces are broad, including unlimited hospital, physician, and ancillary services. Provincial plans also pay for outpatient drugs, although most provinces limit eligibility for this benefit to elderly and low-income patients. The Canadian healthcare is unique in its prohibition of private health insurance for coverage of services included in the provincial health plans.

Fifty-five percent of Canadian physicians are general practitioners or family physicians compared with 35% of similar physicians in the United States. As in other national healthcare systems, general practitioners in Canada act as gatekeepers to the medical system. As a rule, Canadians see their general practitioners, who they are free to choose, for routine medical problems and visit specialists through referral by their general practitioner. Also, because of the close scientific interchange between Canada and the United States, the practice of medicine is very similar in both countries.

Studies of the United States and Canada have compared how receipt of a variety of services, ranging from cardiac surgery to mental healthcare, may vary according to income in the two nations. In the United States, the poor receive less care than the wealthy populations, while in Canada, the opposite is the case. The poor, who generally have worse health outcomes, use healthcare services more in Canada.

In 1970, Canada and the United States spent about the same proportion of their GDP on healthcare (a little more than 7% each). However, since that time, Canada has done a better job of containing healthcare costs. In 1998, Canada spent 9.5% of its GDP on healthcare compared with 13.6% in the United States. Notably, the differences in cost between the United States and Canada are not the result of Canadians receiving fewer services overall. For example, elderly Canadians receive 17% more physician services than the elderly in the United States.

Canadians, on average, spend more days in the hospital and see physicians more often than people in the United States. However, Canada has lower costs than the United States because administrative costs are lower, hospital costs per day are lower, and physician fees and prescription drug prices are lower.

Comparing the Performance of Healthcare Systems

Healthcare systems are often compared on the three criteria of cost, access, and quality of care. Germany and Canada, as well as all other advanced nations, have controlled healthcare costs more successfully than has the United States in the past 20 years, though all nations continue

to face challenges in containing their spending. The United States spends more on its healthcare system than any other nation, about 15% of its GDP. In contrast, healthcare spending as a percentage of GDP in other advanced nations averages about 9%.

Some have speculated that the higher costs of healthcare in the United States are due to greater use of services by its citizens. However, recent studies show that the use of services in the United States is lower than in many other nations, including Germany and Canada. It is now acknowledged that the main factors leading to higher costs of healthcare in the United States include high administrative, pharmaceutical, and medical technology costs; defensive medicine practices; and the high incomes of healthcare providers. For example, it has been estimated that administrative costs represent from 18% to 33% of all healthcare costs in the United States. This compares with about 3% in Canada. A major cause of the high administrative and pharmaceutical costs is the fragmented nature of the U.S. healthcare system. Patients move in and out of insurance coverage from year to year, and this puts tremendous strain on the system in terms of administrative practices such as billing and preventive care. Also, the leverage that insurance companies have in the United States to negotiate lower prices for pharmaceuticals is much less in comparison with governments negotiating leverage in other developed nations. Finally, physicians in the United States get paid on average about twice as much as their counterparts in other developed nations.

The United States has not fared well on the access criterion, being the only developed nation lacking some form of universal healthcare coverage for its citizens. The result has been that about 17%, or 48 million, of Americans are uninsured and many more millions have poor insurance coverage. All other major industrial nations provide universal healthcare coverage, and most of them have comprehensive benefit packages with no cost sharing by patients. Although people in the United States can obtain treatment in a hospital emergency department, many studies have shown that people without health insurance often postpone treatment until a minor illness becomes worse, harming their own health and incurring greater costs.

Barriers in the United States include the costs facing low-income people without health insurance

coverage or with limited insurance coverage. In addition, even Americans with above-average incomes find it more difficult than their counterparts in other nations to get care on nights or weekends without going to a hospital emergency department, and many report having to wait 6 days or more for an appointment to see their own physician.

The Commonwealth Fund has conducted a number of studies comparing the U.S. healthcare system with other national systems, using surveys of patients and physicians and other data. In 2007, it ranked the United States last or next to last compared with five other nations—Australia, Canada, Germany, New Zealand, and the United Kingdom—on most measures of performance, including quality of care and access to it. The Commonwealth Fund study ranked the United States first in providing the “right care” for a given condition, as defined by standard clinical guidelines, and gave it especially high marks for preventive care, such as pap smears and mammograms to detect early-stage breast cancers and blood tests and cholesterol checks for hypertensive patients. But the United States scored poorly in coordinating the care of chronically ill patients, in protecting the safety of patients, and in meeting their needs and preferences, which drove the nation’s overall quality of care rating down to last place. American physicians and hospitals experienced more surgical and medical mistakes than their counterparts in other industrialized nations. Furthermore, the United States had the best survival rate for breast cancer, second best for cervical cancer and childhood leukemia, worst for kidney transplants, and next to the worst for liver transplants and colorectal cancer.

In another study comparing eight countries, the United States ranked last in years of potential life lost to circulatory diseases, respiratory diseases, and diabetes and had the second highest death rate from bronchitis, asthma, and emphysema. Although several factors can affect these results, it seems likely that the quality of care delivered was a significant contributor.

Other criteria that Americans are starting to consider in comparing their health systems with those of other nations include fairness, patient satisfaction, use of information technology, and public health. Each is discussed below.

Fairness

The United States ranks last on almost all measures of equity because it has the greatest disparity in the quality of care given to richer and poorer citizens. This is largely due to the fact that health care is not seen as a public good in the United States but a private good that is only available to those who can afford it. As a result, Americans with below-average incomes are much less likely than their counterparts in other industrialized nations to go to a physician when sick, to fill prescriptions, or to get needed tests and follow-up care.

Patient Satisfaction

Many Americans hold negative views of their healthcare system. In Commonwealth Fund surveys of five countries, American attitudes stand out as the most negative, with a third of the adults surveyed calling for rebuilding the entire healthcare system, compared with only 13% who felt that way in Britain and 14% in Canada. These results may be due to Americans paying higher out-of-pocket costs than citizens of other nations. They are also less likely to have a long-term physician, less able to see a physician on the same day they are sick, and less likely to get their questions answered or receive clear instructions from a physician.

Use of Information Technology

Despite the wide use of computers, software, and the Internet, much of the U.S. healthcare system is still operating with handwritten paper records. American primary-care physicians lag years behind physicians in other advanced nations in adopting electronic medical records or prescribing medications electronically. This situation makes it difficult to coordinate care, identify medical errors, and adhere to standard clinical guidelines.

Public Health

In 2000, the World Health Organization (WHO) ranked the healthcare systems of 191 nations. France and Italy were ranked at the top, while the United States was ranked 37th. The United States had a high infant mortality rate and ranked last of 23 advanced nations. The United States also

ranked near the bottom in healthy life expectancy at age 60 and 15th among 19 nations in deaths from a wide range of illnesses that would not have been fatal if treated with timely and effective care. In terms of prevention, the United States did a better job than other industrialized nations in reducing smoking, but it ranked number one in obesity.

Future Implications

Taken as a whole, the mounting national comparative evidence has caused many healthcare experts, purchasers, health planners, providers, and consumers to seriously question the value of the care that is being provided in the United States. For example, in 2001, the national Institute of Medicine (IOM) identified a chasm between the healthcare the nation had and the care it could have. It reported that the nation's current healthcare system cannot do the job, that trying harder will not work, and that future health reform efforts must reduce the huge number of uninsured, who are the major reason for the poor standing of the United States in health globally. It also identified needed improvements in the coordination of care, the use of computerized records, communications between physicians and patients, and many other factors that impair the quality of care.

The United States spends the greatest amount of money on healthcare among all the nations and because of that, many believe it should be able to provide universal access to care and at the same time provide the highest quality of care in the world. However, there are many entities, including physician organizations, insurance companies, medical device manufacturers, and pharmaceutical companies, with tremendous financial resources and political power, that may attempt to block national healthcare reform efforts. Yet there are other market pressures, such as the decline of employer-based health insurance coverage and a growing willingness by Americans to shop for healthcare in other nations, which may increase focus on healthcare reform in the coming years.

Blair D. Gifford

See also Access to Healthcare; Comparing Health Systems; Cost of Healthcare; Health Services Research in Canada; Health Services Research in Germany; Quality of Healthcare; Satisfaction Surveys

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J

JOINT COMMISSION

The Joint Commission, formerly known as the Joint Commission on Accreditation of Healthcare Organizations (JCAHO), is the largest and oldest accrediting healthcare organization in the United States. It accredits and evaluates approximately 15,000 healthcare organizations and programs in the nation, including general, psychiatric, children's, and rehabilitation hospitals; critical-access hospitals; medical equipment services; hospice services and other home care organizations; nursing homes and other long-term care facilities; behavioral healthcare organizations and addiction service; rehabilitation centers and group practices; office-based surgeries and other ambulatory care providers; and independent or free-standing laboratories.

Founded in 1951, the Joint Commission is an independent, private, nonprofit organization located in Oakbrook Terrace, Illinois, with a satellite office based in Washington, D.C. The Joint Commission's mission is to improve the quality and safety of care received by the public through healthcare accreditation and through services that support performance improvement in healthcare organizations. The Joint Commission carries out its mission by accrediting healthcare organizations and by providing healthcare performance improvement services. It maintains performance-based standards and evaluates healthcare organizations' compliance with these standards in maintaining safety and quality care. Once a

healthcare organization is accredited or certified, it must reapply for accreditation every 3 years or for recertification every 2 years.

The Joint Commission also awards a certification, known as the Disease-Specific Care Certification, to health plans, disease management service companies, hospitals, and other care delivery settings that provide disease management and chronic-care services.

The Joint Commission was formerly led by its longtime president Dennis S. O'Leary and is currently under the leadership of Mark R. Chassin. The Joint Commission is overseen by a Board of Commissioners, which is composed of healthcare professionals, including nurses, physicians, medical directors, and providers, as well as consumers, administrators, employers, a labor representative, health plan leaders, quality experts, ethicists, a health insurance administrator, and educators. The corporate members of the Joint Commission include the American College of Physicians (ACP), the American College of Surgeons (ACS), the American Dental Association (ADA), the American Hospital Association (AHA), and the American Medical Association (AMA). The Joint Commission employs more than 1,000 individuals in its surveyor workforce.

Since the Joint Commission was formed, voluntary accreditation and quality assurance systems have been adopted across the globe, by countries such as Canada, Australia, and various European nations.

While the Joint Commission is not able to cite or fine an organization for not meeting its standards,

its accreditation program does carry significant weight. Under the federal Medicare law, Joint Commission–accredited hospitals are “deemed” to have met the requirements for participation in the Medicare program. Similarly, most states have incorporated Joint Commission accreditation standards into their hospital licensure standards. The failure of an organization to meet the Joint Commission’s standards can result in the loss of accreditation as well as millions of dollars in Medicare and Medicaid funding.

Some of the benefits of Joint Commission accreditation include an outside evaluation of an organization’s quality and safety of care. Joint Commission accreditation also provides knowledge to the public of whether an organization meets or exceeds its standards.

Recent criticisms of the Joint Commission have included the perceived rigor of its hospital survey process in assessing quality care, as the vast majority of hospitals that seek accreditation receive it. A potential conflict of interest cited by critics is the Joint Commission’s subsidiary (Joint Commission Resources) that provides consultation to hospitals on how to gain accreditation and improve their performance. The Joint Commission assuages these concerns by noting that there are policies in place (“firewall”) that create a barrier between its subsidiary and the accreditation division, preventing the sharing of information. Additionally, the composition of the Joint Commission’s Board of Commissioners, made up of members from the AHA, AMA, and the ACP, to name a few, raised some questions about the Joint Commission’s ability to objectively accredit organizations that it oversees.

The Joint Commission has also received a backlash from its constituent members, including the AHA and the AMA. Some of these grievances include the range of variability in the accreditation survey process, the value of Joint Commission services, and the role of the Joint Commission as a peer review organization. AMA members have also felt that the Joint Commission’s requirements had become too burdensome and costly relative to the benefits yielded by its accreditation and that the Joint Commission was unresponsive to physician complaints. State hospital associations have also explored comparable alternatives to the Joint Commission accreditation.

Early History

In 1910, Ernest A. Codman, a Boston surgeon, developed the *end-result system* of hospital standardization. Under this system, hospitals would track every patient to determine if his or her treatment was effective and, if not, to find out how to prevent this from happening again in the future. At the urging of Franklin H. Martin, the ACS was founded in 1913, and the end-result system became a stated objective of this nascent organization. In 1917, the ACS formally established the Hospital Standardization Program, and 2 years later it adopted five official standards, known collectively as the Minimum Standards for Hospitals. The adoption of these Minimum Standards formed the foundation for the accreditation process.

The first on-site hospital inspections took place in 1918, and at the time, only 89 out of 692 hospitals met this standard. The dismal state of hospitals demonstrated the urgent need for a national hospital accreditation program. As the ACS Hospital Accreditation Program’s success grew, more hospitals sought its approval, and by 1950, over half of the hospitals in the United States were accredited.

The ever-increasing complexity of medical care and the growth of nonsurgical specialties after World War II required that hospital standards be reviewed, revised, and updated to reflect these changes. The Hospital Standardization Program would therefore need the support of the entire medical community, and as a result, the ACS sought the participation of other national professional organizations to improve the voluntary accreditation program.

In 1951, the ACS joined with the ACP, the AHA, the AMA, and the Canadian Medical Association to form the independent, nonprofit organization the Joint Commission on Accreditation of Hospitals (JCAH). The primary purpose of JCAH was to provide voluntary accreditation. The following year, JCAH took over the Hospital Standardization Program from the ACS, and in 1953, the *Standards for Hospital Accreditation* was published. The Canadian Medical Association later withdrew from the JCAH in 1959 and created its own accrediting body in Canada.

The JCAH perpetuated the traditions of the ACS by providing voluntary accreditation with

standards agreed on by health professionals as providing quality care, and the accreditation survey would still represent a combination of evaluation, education, and consultation. All information obtained through the survey process would be held in confidence between the JCAH and its member organizations.

The Joint Commission continued to expand its program, now called the Hospital Accreditation Program, and hired and trained surveyors to focus on medical staff and patient care issues.

Evolving Role

With the passage of the Medicare Act in 1965 (PL 89-97), the role of the JCAH shifted, and it became more closely affiliated with the federal government. This law provided that hospitals accredited by JCAH would be deemed in compliance with most of the Medicare Conditions of Participation for Hospitals and, thus, would be deemed eligible to participate in the Medicare and Medicaid programs. The Social Security Act (PL 92-603), later amended in 1972, required that the Secretary of the U.S. Department of Health and Human Services (DHHS) validate JCAH findings and include an evaluation of its accreditation process in the department's annual report to the U.S. Congress. Today, 39 states and the District of Columbia have incorporated the Joint Commission's hospital accreditation into their licensure programs. Although hospitals may be accredited, they must also remain in compliance with state hospital licensing statutes and regulations.

The combination of voluntary, private-sector accreditation and government regulation has served to facilitate the quality assurance process by allowing state governments to focus their enforcement efforts and limited resources on "problem" facilities.

Again in 1966, the JCAH standards had undergone significant revisions to reflect optimal achievable levels of quality rather than the minimum levels of quality. The reason for this major decision was that most hospitals had achieved or maintained the minimal standards and were no longer being challenged. Additionally, with the government's growing involvement in regulating hospitals through state licensure and the federal Medicare program, JCAH would have to define the optimal achievable level of care if it were to remain at the

forefront of hospital standard setting. The optimal achievable standard would be later defined as the best that could be achieved, making the healthcare provided as effective as possible. This impetus resulted in the publication of the *1970 Accreditation Manual for Hospitals*.

Beginning in the late 1960s and early 1970s, the JCAH greatly began to expand its role in accrediting new programs with the growth of other healthcare organizations. Because of JCAH's experience with accrediting hospitals and its widespread acceptance among the medical community, it was fitting for it to branch out into these new endeavors. The JCAH started accrediting organizations that served the developmentally disabled through the Accreditation Council for Services for the Mentally Retarded and Other Developmentally Disabled Persons; psychiatric facilities, substance abuse programs, and community mental health programs through the Accreditation Council for Psychiatric Facilities; long-term care facilities through the Accreditation Council for Long Term Care; and ambulatory healthcare facilities through the Accreditation Council for Ambulatory Health Care. In 1978, the JCAH and the American College of Pathologists created a collaborative agreement for the evaluation of laboratories in hospitals, and in 1983, it began to accredit hospice care organizations as well.

During this period of growth, the Joint Commission established a Professional and Technical Advisory Committee. The Committee's role was to advise the Joint Commission on developing standards and survey procedures. Through its Board of Commissioners, the Joint Commission is able to have close ties with health professionals and maintain its survey process and standards to reflect current knowledge and practices.

With its expanded scope of endeavors in healthcare, the JCAH formally changed its name to the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) in 1987.

Quality Assurance and Patient Safety

With the development of the minimum standards by the ACS, for the first time hospitals were evaluated for the quality of care they provided. When the Joint Commission took over hospital accreditation, it continued to develop standards that

reviewed and evaluated hospital quality. For the most part, however, these evaluations were informal and often subjective. During this time, research into more objective and valid criteria and systematic review procedures for measuring quality were being developed. This later formed the foundation for the Joint Commission's retrospective, outcome-oriented auditing practices that commenced in the 1970s.

Standards were developed that evaluated the quality and appropriateness of care, including safety management, utilization review, and infection control. The Joint Commission also requested that hospitals review the credentials in granting clinical privileges to its medical staff.

While the Joint Commission focused on these quality assurance efforts, hospital audits became more of a routine exercise to meet the Joint Commission's standard requirements rather than focusing on quality care, and therefore this failed to meet its intended objective. In 1979, the Joint Commission addressed this problem by developing a new systematic quality assurance process that focused on hospital-wide assessment activities, including the monitoring and evaluation of all aspects of patient care and problem identification.

Starting in the early 1990s, the Accreditation Manual for Hospitals began to be reorganized around standards that emphasized performance improvement concepts and later shifted to standards that examined an organization's actual performance rather than its capability to perform. Also during this time, the Joint Commission began to conduct random, unannounced surveys of 5% of its accredited organizations.

A sweeping revision to the accreditation process took place with the 1994 Agenda for Change. The Agenda for Change had as its centerpiece integrating performance measurement into the accreditation process to carry out the Joint Commission's mission of continuously improving patient safety and quality of care. During the planning process of the Agenda for Change, the Joint Commission was involved in the development, testing, and implementation of standardized performance measures. As far back as 1986, the Joint Commission established a set of performance measures that were to be collected from and transmitted to all accredited hospitals, known as the

Indicator Measurement System. Although this project never came to fruition, it served as the predecessor and impetus for the new ORYX initiative. With the growing scope of knowledge, the Joint Commission revised its original performance measures and pursued a collaborative approach in the ORYX initiative.

In 1997, the ORYX initiative for the first time used performance and outcome measures in the accreditation process that was applied to hospitals, long-term care organizations, and healthcare networks. ORYX was later expanded to include behavioral healthcare and home care organizations.

ORYX is a tool used by healthcare organizations to evaluate their ongoing healthcare performance and to inform them of their continuous quality improvement efforts. Initial policies called for accredited healthcare organizations to select two of the approved measures. This information was to be collected on monthly data points and transmitted on a quarterly basis to an approved performance measurement system. In July 2002, the first ORYX measures on accredited hospitals were collected. Today, hospitals are required to select three core measure sets in order to satisfy accreditation requirements. To reduce the burden of reporting requirements for hospitals, the Joint Commission worked with the Centers for Medicare and Medicaid Services (CMS) and other entities to standardize these core measures.

Quality Check was established the same year as ORYX, and it serves as a directory of accredited organizations and performance reports available for public use on the Joint Commission Web site. In 2004, the debut version of *Quality Report* became available to the general public, allowing easy access to organization-specific data displayed against comparative state and national data.

Aligned with its mission to improve the quality of care, the Joint Commission established the Sentinel Events Policy in 1996 to review an organization's response to sentinel events during full accreditation surveys and unannounced random surveys. The Joint Commission defines a sentinel event as an unexpected occurrence that involves death or serious physical or psychological injury to a patient. This policy was later revised to promote self-reporting of medical errors and to identify the causes of these events. The Sentinel Events Policy was later further modified so that organizations

could request an on-site review instead of reporting the cause of the sentinel event due to litigation concerns.

In 2002, the Joint Commission established the National Patient Safety Goals to promote specific improvements in patient safety. These goals represent problematic areas in healthcare. To address these concerns, evidence and expert-based solutions to these problems have been prescribed. Some of the future goals of the Joint Commission include improved medication safety, communication by caregivers, and accuracy of patient identification; risk reduction in healthcare-associated infections, surgical fires, patient falls, and the occurrence of influenza and pneumococcal disease in older adults who are institutionalized; prevention of healthcare-associated pressure ulcers; organizational identification of safety risks in the patient population; involvement of patients in their own care; and implementation of relevant National Patient Safety Goals.

Present and Future Directions

Launched in 2004, “Shared Vision-New Pathways” ushered in fundamental revisions to the accreditation process. The focus of this new accreditation process is on organizational systems involved in patient care and healthcare quality. The Joint Commission’s new focus will be on the processes of patient care and the specific issues of a particular healthcare organization. This is in response to some healthcare organizations’ past practices of “ramp-up” efforts to meet Joint Commission requirements immediately preceding an on-site survey.

The term *Shared Vision* is the vision that the Joint Commission and healthcare organizations share on the quality of patient care. The “New Pathways” are approaches to the accreditation process to achieve this shared vision. Some of the modifications under the New Pathways approach include the consolidation of standards to reduce the amount of paperwork and documentation necessary and to focus on patient safety and quality care, the transition from performance reports to quality reports, the periodic performance review (PPR), which will make accreditation more of a continuous and ongoing process, a patient “tracer” methodology, and a customized focus of the on-site survey as directed by the priority focus process.

Another major part of this change is the Joint Commission’s unannounced surveys. The unannounced survey of hospitals will occur every 18 to 39 months after an organization’s first unannounced visit. The Joint Commission will also soon require periodic performance reviews of healthcare organizations that involve conducting a self-assessment in between survey visits.

The Joint Commission continues to evolve and revise its standards to reflect changes in technology and advances in medical knowledge and best practices. Its accreditation has come to be regarded as a symbol of quality indicating that a healthcare organization meets certain performance standards. A healthcare organization must participate in an on-site accreditation survey at least every 3 years to earn and maintain the Gold Seal of Approval. The Joint Commission continues to be at the forefront in developing new standards and initiatives to improve patient safety and healthcare quality.

Jared Lane K. Maeda

See also Accreditation; Chassin, Mark R.; Codman, Ernest Amory; National Patient Safety Goals; O’Leary, Dennis S.; ORYX Performance Measurement System; Patient Safety: Quality of Healthcare

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<http://www.facs.org>

Joint Commission: <http://www.jointcommission.org>

Joint Commission Resources (JCR): <http://www.jcrinc.com>

Quality Check: <http://www.qualitycheck.org>

K

KAISER FAMILY FOUNDATION

The Henry J. Kaiser Family Foundation is a non-profit, private-operating foundation dedicated to providing information and analysis on healthcare issues and policy. It is an important source of facts and analysis for policymakers, the media, the healthcare community, and the general public.

The foundation was established in 1948 by Henry J. Kaiser and his wife, Bess, to meet the unmet healthcare needs of the citizens of the United States. Its founder, Henry J. Kaiser, was a legendary American industrialist who completed massive construction projects such as the Hoover Dam and built Liberty ships during World War II and automobiles after the war. In healthcare, he pioneered the idea for the Kaiser Permanente HMO, which became the model for health maintenance organizations (HMOs) nationwide.

Headquartered in Menlo Park, California, with an additional office in Washington, D.C., the Kaiser Family Foundation funds its own research and communication programs, sometimes in partnership with other research organizations or major media companies. Working with an annual budget of over \$40 million, the foundation operates independently. This independence allows it to provide information on a nonpartisan basis.

Although most of the Kaiser Family Foundation's work concentrates on healthcare issues in the United States, in recent years, it has expanded its scope to include global health issues. The foundation provides up-to-date information,

research-based evidence, and recommendations on various health topics, and it advocates for vulnerable populations. Much of its work relates to medically underserved populations such as low-income families, minorities, women, and people living in developing countries.

Health Policy Programs

The Kaiser Family Foundation has six programs addressing U.S. healthcare policy: (1) Kaiser Commission on Medicaid and the Uninsured, (2) Health Care Marketplace Project, (3) HIV Policy Program, (4) Medicare Policy Project, (5) Race/Ethnicity and Health Care Program, and (6) Women's Health Policy Program.

Begun in 1991, the Kaiser Commission on Medicaid and the Uninsured is the largest operating program of the foundation. The commission focuses on healthcare policy and research regarding low-income families. It examines how Medicaid and the State Children's Health Insurance Program (SCHIP) work and the corresponding issues facing uninsured individuals and families.

The Healthcare Marketplace Project examines the trends and determinants of the nation's healthcare economy. The project provides resources for employer health programs, including information about health insurance, the pharmaceutical industry, and healthcare costs.

The foundation's HIV Policy Program addresses the costs of treatment, the effectiveness of prevention methods, and the political atmosphere surrounding the disease. The program conducts

research and shares the most recent information about HIV/AIDS, including changes in public opinions, policies, and laws.

The Medicare Policy Project provides resources, statistics, and analysis concerning that federal healthcare program. As the American public ages, a growing number of individuals are using Medicare. The project offers comparisons of various Medicare plans and descriptions of benefits, including the new prescription drugs component. The resources provided by the project assist people in understanding and navigating this complicated benefits program.

The Race/Ethnicity and Health Care Program addresses health disparities and the difference in health status among people of color. The program conducts research on issues related to access to care, especially quality healthcare, and recognizes that public policy is an influential factor in reducing health disparities.

The Women's Health Policy Program focuses on the complex issues relating to women's health. It focuses on reproductive health issues, maternal and child health, and the health needs of uninsured women.

Media and Public Education Programs

The Kaiser Family Foundation has five media and public education programs: (1) Entertainment Media Partnership, (2) Media Fellowship and Internship Programs, (3) Program for the Study of Entertainment Media and Health, (4) Public Opinion and Media Research Program, and (5) Kaiser Family Foundation Web sites.

Through its Entertainment Media Partnerships, the foundation conducts several public health information campaigns. Current campaigns provide messages to young people about HIV/AIDS and other sexually transmitted diseases. Media partners involved in these campaigns include MTV, Viacom, BET, Univision, and Fox. In addition, the foundation coordinates a public health information campaign in South Africa.

The foundation's Media Fellowships and Internships Programs offer fellowships and internships to journalists interested in health policy news. These programs help inform and develop journalists' understanding of health policy topics. The foundation also offers several resources and tools for journalists' professional development.

The foundation's Program for the Study of Entertainment Media and Health studies the media's impact on young people. Its work includes an examination of food advertising to children, sex and violence on television, and how youth in the 21st century use media devices. The analysis of this research is used to develop policy and plan community health education programs. In addition to studying the media, the foundation often partners with news media organizations on issues related to health policy. The foundation currently maintains partnerships with *USA TODAY*, *The Washington Post*, the *San Jose Mercury News*, and XM satellite radio.

Through its Public Opinion and Media Research Program, the foundation regularly conducts public opinion polls that survey people's experiences with the nation's healthcare system and determines their views on specific health topics. Results from the polls are made available through the foundation's publications and on their Web sites.

The Kaiser Family Foundation Websites program attempts to keep people informed through its many Web sites. For example, the Kaiser Network is a source of information for health news. The network collects health news stories from around the world and offers daily summaries to consumers through e-mail subscriptions and Web sites. These daily reports cover topics including health policy, HIV/AIDS, women's health policy, and health disparities. On the Kaiser Network Web site, viewers will find headlines featuring top health stories and links to entire articles. The Web site also provides comprehensive information on a particular health issue in its "Issue Spotlight" section. Viewers may also search archives containing 65 years of health opinion polls. The Kaiser Network also provides an archive of HealthCasts. Webcast technology allows the foundation to broadcast events online and archive the products so that consumers may access the resources at a later date. Meetings, conferences, workshops, and other professional development events related to health care and health policy are examples of the types of HealthCasts available through the Kaiser Network.

The foundation's State Health Facts Web site provides health statistics and information for each of the 50 states in the nation. Data provided on this site are collected from a variety of public and private sources. Information about more than 500

health topics is available on this Web site. Viewers may research health data by individual state or make comparisons among states with the resources available on this site. Examples of categories featured on the State Health Facts site include state demographics, economy, health status of the population, health coverage and the uninsured, Medicaid and SCHIP, health costs and budgets, Medicare, managed care and health insurance, minority health, women's health, and HIV/AIDS.

KaiserEDU.org is a foundation initiative that coordinates several resources and tools for students, faculty, and others. Information and data about the health topics addressed by the foundation are provided. University faculty have the opportunity to share course outlines using the Syllabus Library function on the Web site. The foundation makes available the Table of Contents of several major health journals and provides several research tools. Three online tutorials are available that provide information about collecting and analyzing data. The foundation has created a health video library through KaiserEDU.org. This online library contains links to original producers of health videos and documentaries. The foundation does not loan videos; however, it directs viewers to the production source so that they may obtain it on their own. The health video library serves as a clearinghouse as to what type of information is available.

Kristin Hartsaw

See also Altman, Drew E.; Health Insurance; Medicaid; Medicare; Public Policy; Uninsured Individuals; Vulnerable Populations; Women's Health Issues

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Kaiser EDU: <http://www.Kaiseredu.org>

Kaiser Network: <http://www.kaisernetwork.org>

State Health Facts: <http://www.statehealthfacts.org>

KANE, ROBERT L.

Robert L. Kane is a highly regarded expert in the field of aging and long-term care. Kane holds an endowed chair in long-term care and aging and is a professor at the University of Minnesota School of Public Health in the Department of Health Policy and Management. He also directs the Center on Aging and the Minnesota Geriatric Education Center and codirects the Clinical Outcomes Research Center at the University of Minnesota. In addition, he directs an evidence-based practice center funded by the Agency for Healthcare Research and Quality (AHRQ).

Kane has received numerous awards and honors throughout his long career, including the President's Award from the American Society on Aging, the Polisher Award from the Gerontological Society America, and the Enrico Greppi Prize from the Italian Society of Gerontology and Geriatrics. He has conducted numerous studies on the outcome of care and the organization of care, with an emphasis on the care of the elderly and those needing long-term care. Kane has served on the World Health Organization's (WHO's) Expert Committee on Aging. He has authored or edited more than 30 books and 350 journal articles and book chapters on the topics of health services research, geriatrics, and long-term care.

Kane earned his bachelor's degree from Columbia College in 1961 and his medical degree

from Harvard Medical School in 1965. He did his medical internship, followed by a residency in community medicine, at the University of Kentucky Medical Center.

He began his career in 1968 as an acting coordinator in the Senior Clerkship Program at the University of Kentucky in the Department of Community Medicine. He then went on to serve in the U.S. Public Health Service (PHS) as a service unit coordinator and as special assistant to the Regional Health Director. In 1970, Kane was appointed as an assistant professor and later as an associate professor in the Department of Family and Community Medicine at the University of Utah School of Medicine. After leaving the University of Utah in 1977, he went to the RAND Corporation as a senior researcher and later joined the faculty of the University of California at Los Angeles (UCLA). Following this, Kane served as dean of the University of Minnesota School of Public Health from 1985 to 1990 and then in his current position as a professor.

Kane's current research addresses the outcomes of acute and long-term care with a focus on the effects of hospital and posthospital care while examining methods to better deliver chronic care. He has published a book, *It Shouldn't Be This Way*, with his sister, Joan West, about the personal difficulties encountered in obtaining long-term care for their mother. Kane also formed a national advocacy group, Professionals with Personal Experience in Chronic Care (PPECC), to put long-term care and chronic disease on the political agenda by drawing on the experiences of health-care professionals in the field.

Jared Lane K. Maeda

See also Chronic Care Model; Evidence-Based Medicine (EBM); Long-Term Care; Nursing Home Quality; Nursing Homes; Outcomes Movement; Quality of Healthcare

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University of Minnesota School of Public Health,
Department of Health Policy & Management Faculty
Profile: http://www.hpm.umn.edu/People/regular/kane_Robert/Kane_Robert.htm

KATZ, SIDNEY

Sidney Katz is a Distinguished Scholar at the Benjamin Rose Institute in Cleveland, Ohio, and Professor Emeritus of Geriatric Medicine and Codirector of the Stroud Center on Scientific Studies of Quality of Life at Columbia University in New York City. His background is in medicine, epidemiology, and health services research, with a focus on rehabilitation, the natural course of aging and chronic disease, long-term care, and quality of life.

Katz has made a number of significant contributions to geriatrics and health services research. He was one of the leading champions of the development of the field of geriatric care. In addition, he was one of the earliest proponents of the idea that the goal of treatment for persons with chronic illness was improving their quality of life. In his research, Katz moved away from focusing only on disease diagnoses to examining the interaction and impact of multiple chronic diseases. Furthermore, he argued that functional status was a more useful measure of total disease burden and an important indicator of service quality and quality of life. Moreover, Katz led the team that developed the first indices of activities of daily living (ADLs) to measure changes in physical function. His work emphasized the centrality of physical function in the field of geriatrics and health services research and yielded a relatively precise, standardized measure of physical functioning. The Katz Index of ADLs clarified the hierarchal

nature of functional limitations and became pivotal in the development of measures of outcome quality in rehabilitative and long-term care.

Born in Cleveland, Ohio, Katz earned a bachelor's degree in general sciences (1944) and a medical degree from Case Western Reserve University (1948). He attended the Walter Reed Army Medical Service graduate school and received a master's degree (1984) in medical sciences from Brown University. Over the course of his long and distinguished career, Katz has been a U.S. Navy corpsman in World War II, a professor in the School of Medicine at Case Western Reserve University, an army physician in Korea, a department chair in the College of Medicine at Michigan State University, and associate dean of Medicine at Brown University. In 1986, he founded Brown's Center for Gerontology and Health Care Research, which for more than 20 years has carried out his vision of emphasizing multidisciplinary research in training clinicians, behavioral scientists, and statisticians in health services research with an emphasis on geriatrics, gerontology, and chronic disease management.

Katz has been a champion for improving the range and quality of long-term care services available to older persons in their homes, communities, and long-term care facilities, and he has been an advisor to national and world leaders. As a member of the national Institute of Medicine (IOM), he has served on many committees aimed at improving healthcare quality, but his most distinguished service came as chair of the IOM Committee on Nursing Home Regulation. This Committee's recommendations were largely adopted by the U.S. Congress in the nursing-home reforms contained in the Omnibus Budget Reconciliation Act of 1987 (OBRA-87). OBRA-87 was the most fundamental reform of federal nursing-home standards since the passage of the Medicare and Medicaid programs and specified a new model of nursing-home care that included uniform resident assessment, increased attention to residents' rights and quality of life, a revised process for inspecting nursing homes, and a range of enforcement remedies. The IOM committee's recommendations, as incorporated in OBRA-87, were resident centered and outcome focused, shifting regulators from attention to paper compliance with regulations to a focus on the real care and quality of life experienced by nursing-home residents. Furthermore, the

philosophy of OBRA-87, with its focus on resident-centered care, provided considerable support for the current move emphasizing culture change in nursing homes.

Katz has been recognized for his service and research in a number of ways, including receiving the Bronze Star for his service in a Mobile Army Surgical Hospital in the Korean War. He is listed in *Who's Who in Health Care* and has received a number of awards and honors, including the Lifetime of Caring Award from the American Geriatrics Society's Foundation for Health and Aging. Brown University established an honorary lectureship in his name, Columbia University awarded him its Medal of Excellence in Scholarship and an Award for Excellence in Health Policy Research in Geriatrics and Gerontology, and the Benjamin Rose Institute established the Katz Policy Institute in his honor. He also has been recognized by the Gerontological Society of America, receiving the Maxwell Pollack Award for Productive Aging for research that directly improved policy or practice and the Donald P. Kent Award for exemplifying the highest standards of professional leadership in gerontology through teaching and service.

Catherine Hawes

See also Activities of Daily Living (ADL) Scale; Long-Term Care; Institute of Medicine (IOM); Nursing Homes; Nursing-Home Quality

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Brown University, Center for Gerontology and Health Care Research: <http://www.chcr.brown.edu/postdocFrameset.htm>

KELLOGG FOUNDATION

The W. K. Kellogg Foundation located in Battle Creek, Michigan, has been funding community-based approaches to health and well-being since its inception in 1930. Established by Will Keith Kellogg (1860–1951), the founder of a global ready-to-eat cereal company and one of the world's largest philanthropists, it was originally named the W. K. Kellogg Child Welfare Foundation and focused its attention on the health needs of children living in Michigan's rural communities by providing hearing tests, eye exams, immunizations, and school lunches under the aegis of its Michigan Community Health Project (MCHP). Since that time, the foundation has provided seed funding and ongoing support for education, service, and research in public health, including food security and health professions education, as well as agriculture and community development. In keeping with Kellogg's intention to use a portion of his fortune to help people help themselves, its priorities have consistently leaned toward empowerment strategies and sustainable development. In recent years, it has diversified its funding, directing more money toward projects in the developing world, particularly Southern Africa (10% of total giving in 2006) and Latin America (8% of total giving in 2006).

The Kellogg Foundation's mission is to help people help themselves through the practical application of knowledge and resources to improve their quality of life and that of future generations. In 2007, the foundation refined its mission to focus more closely on vulnerable children. Its operations are rooted in several core values, including fidelity to the spirit and intent of its founder, a belief that individuals have an inherent capacity to effect change in their lives, organizations, and communities and that innovativeness in thoughts and action leads to enduring and positive change in both formal and informal systems. The foundation operates under the guiding principles of partnership, empowerment, and community development. Throughout its history, this orientation has influenced its role in public health and health services research.

Background

By its 25th anniversary in 1955, the Kellogg Foundation's assets stood at \$124 million. From an annual payout of \$26,000 in 1930, it was now able to give \$4.4 million. In 1980, its 50th anniversary year, the foundation made grants of more than \$52 million. In 2005, its 75th anniversary year, its assets had grown to \$6 billion, and its annual grant making totaled \$243 million. As of August 2007, the foundation's assets were over \$8.4 billion.

A review of the Kellogg Foundation's first decade sheds light on its operations over history. Most activities during the 1930s were directed toward filling the gaps in service resulting from the financial hardships and community dislocations caused by the Great Depression. Even during these early years, the foundation showed its commitment to innovative solutions to public health problems, most notably by hiring Margarite Wales as nursing director. Wales had experience in the landmark Henry Street Settlement House, widely regarded as having given birth to the discipline of public health nursing while improving neighborhood conditions and the personal health of residents of New York City's Lower East Side. The foundation's commitment to nursing continues to this day.

By the middle of its first decade, the foundation had established its first graduate medical education program, awarding fellowships to U.S. and Canadian physicians. Its commitment to health professions education was further demonstrated later in the decade, when, in 1939, it made a grant to the University of Michigan to establish the Institute of Graduate and Post-Graduate Dentistry, designed to provide continuing education for dentists in the community. In the early 1940s, the Kellogg Foundation, with the Rockefeller Foundation, helped build the University of Michigan School of Public Health; this is the first instance of another foundation tradition: using its resources to leverage even greater resources.

In addition to funding health profession education, in 1938, the Kellogg Foundation began funding Michigan State University to develop and host short agricultural education courses for young people from Michigan's farm communities. The foundation funds similar programs to this day.

Activities in the spirit of helping people help themselves can be traced back to the foundation's early history. From 1931 to 1948, the foundation supported the Michigan Community Health Project in seven Michigan counties. This comprehensive community development project consolidated rural schools, built hospitals and health departments, and encouraged volunteers to deliver essential services. In 1938, the foundation conducted a poll of the counties that were participating in the project to determine if residents found it beneficial and would be willing to be taxed in order to continue it. The answer was a resounding "yes," which reflected the popularity of the services and the level of community commitment and willingness to support it.

Enduring Themes

These themes—serving underserved communities, pursuing community-based approaches, employing empowerment strategies, enhancing community-based learning opportunities for health professionals, financing research on agriculture, and funding innovative approaches to recognized public health problems—guide the foundation to this day.

Serving Underserved Communities

Over the past 15 years, the Kellogg Foundation has addressed a number of issues that affect U.S. communities experiencing impaired access to healthcare, disinvestment in public health infrastructure, and educational disadvantage. In 1998, responding to the increasing number of Americans lacking health insurance, the foundation launched its Community Voices Initiative: Health Care for the Underserved to sustain safety net providers through partnerships with community health and human service providers. Community Voices is national in scope and is managed by the National Center for Primary Care (NCPC) at the Morehouse School of Medicine. In addition to providing funding for at-risk safety net providers, the foundation continues to provide direct service in communities of dire need. As an example, the School-Based Health Care Policy Program, a 5-year effort begun in 2004, was designed to provide school-based health throughout the United States using a consumer-centered model of quality care.

Pursuing Community-Based Approaches

Many examples of health-related community-oriented approaches have already been discussed. The foundation's community-oriented strategy touches other program areas as well. For example, in 1997, the Kellogg Foundation launched its Mid-South Delta Initiative connecting 55 counties in Arkansas, Louisiana, and Mississippi in community-based efforts to strengthen regional economic opportunities. This multifaceted program of technical assistance, business loan guarantees, and home ownership programs positioned the foundation to make substantial contributions to Hurricane Katrina relief. Katrina-related giving played a major role in foundation programs for several years.

Employing Empowerment Strategies

The Mid-South Delta Initiative is one of many Kellogg Foundation-funded projects that employed a local empowerment strategy. The foundation funded the Pathways to Collaboration project, organized by the Center for the Advancement of Collaborative Strategies in Health at the New York Academy of Medicine, and provided multi-year funding for seven partnerships around the nation to address local issues through community-driven collaboration.

Enhancing Community-Based Learning Opportunities for Health Professionals

Investment in health professions education has been a core activity of the foundation. Innovations include funding National Medical Fellowships, Inc. to develop a pool of qualified students to enter health professions education for careers in community-based health services by building partnerships with communities. During the 1990s, three multiyear health initiatives—Community Partnerships for Health Professions Education, Graduate Nursing and Medical Education, and Community-Based Public Health—were launched. These three programs shared a strategic interest in helping to make systems more responsive to the needs of people in the community. At the same time, the foundation invested in a series of other projects, known as Community Partnerships, to redirect health professions education toward community-based primary care. Taken together, these projects

provided millions of dollars to health professions schools and their community partners, training many public health professionals and primary-care professionals (nurses and physicians) to practice in community-based settings and actively engaging their communities in setting priorities toward achieving healthier communities and individuals. During the same period, the foundation invested in many of the U.S. Historically Black Colleges and Universities, allowing them to reshape their curricula in an effort to increase the number of minority applicants to graduate education.

Financing Research on Agriculture

The Kellogg Foundation invests in primary research on foodstuffs and agricultural practices. Launched in 2000, its Food and Society Initiative is designed to ensure access to a food supply that is safe and nutritious and grown in a manner that protects the environment while adding economic and social value to rural and urban communities. In keeping with its orientation toward investment in the future, it is also funding Iowa State University to revise Iowa's education programs in order to prepare food system professionals to meet the emerging needs of the agriculture sector of the economy. The foundation also supports various environmental projects, including groundwater protection and remediation. In the 1990s, the Integrated Farming Systems Initiative funded 18 projects to build demonstrations of viable agricultural systems that also ensure protection of the environment. Projects include the central Ohio Darby Creek Watershed, a successful collaboration between local farmers, environmentalists, and the Nature Conservancy.

Funding Innovative Approaches to Recognized Public Health Problems

In 1996, the Kellogg Foundation launched the Turning Point Initiative to improve public health nationwide through the development of community-based public-private partnerships. This ambitious project, undertaken in collaboration with the Robert Wood Johnson Foundation, set out to change the basic framework and infrastructure of public health through a collaborative process that engaged a wide-range of partners, including the

Centers for Disease Control and Prevention (CDC), the national Institute of Medicine (IOM), the American Public Health Association (APHA), the National Conference of State Legislatures, the National Association of Local Boards of Health, and the National Association of County and City Health Officials (NACCHO). Turning Point addressed a myriad of issues and responded to the changing priorities after the September 11, 2001, terrorist attacks, creating collaborative structures for preparedness, including bioterrorism. During 1996–2002, the foundation funded 41 local public health departments in 14 states to engage in strategic planning and policy development using an inclusive, collaborative approach. Most significantly, a model public health act was published in 2003 and has been used as a template for public health law reform efforts in a number of states.

International Programming

In 1937, two Montreal physicians were awarded Kellogg fellowships, beginning the foundation's work outside the United States. Upon his retirement in 1938, Kellogg spent a significant amount of time in Mexico, thus beginning the foundation's interest in Latin America. In 1941, nine physicians from Chile came to Battle Creek, a visit that resulted in a health professions fellowship program that brought over 200 Latin American health professionals to the United States between 1941 and 1945. The foundation has maintained a programmatic focus in Latin America since that time. Starting in 1985, the foundation funded the Integrated Health Program at Federal University of Ceara in Fortaleza, Brazil. This program created a network of hospitals and clinics linked to the university to improve care in communities and broaden the training of health professionals. Today, the foundation maintains an office in Latin America and funds health professions education, public health initiatives, and community development projects in many Latin American countries.

In 1985, the Kellogg Foundation began to fund programs in Africa. Since that time, it has funded direct service, educational scholarships, health professions training, and community partnerships. After the fall of apartheid in South Africa, the foundation decided to refocus its African

priorities. Using the community participatory approach it has espoused throughout its history, the foundation conducted a thorough program review, meeting with hundreds of community members, professionals, and policymakers across southern Africa. Ten demonstration sites were developed in rural areas with a programmatic focus on civic engagement, economic opportunity, skills and leadership development, and health and well-being. Today, funding for health professions education continues, and a regional office, staffed by Africans, currently operates in South Africa.

Funding Priorities

Information regarding the foundation's current funding priorities is available on the foundation's Web site. Funding is available through specific requests for proposals as well as unsolicited responses to general funding guidelines; most often, the foundation prefers a short preproposal when responding to general guidelines. It will consider a wide range of activities that support its stated mission and goals. Requests can include funding for research, operational expenses for established programs, capital requests, loans, equipment, conferences, media projects, endowments, and development campaigns when these requests are part of a broader program and/or funding effort. Program-planning grants and study proposals may also be considered when tied to specific projects in line with the foundation's priorities. In keeping with its philosophy of helping people help themselves, provisions to ensure project sustainability after funding ends are critical for a successful proposal.

Impact on Health Services Research

The Kellogg Foundation's commitment to health and well-being has been consistent throughout its history. This has included funding for direct service, health professions education, and policy initiatives. Traditionally, it has supported research not as an end in itself but as a vital part of accomplishing these other goals; the same can be said regarding specific medical conditions such as tuberculosis or HIV. Many of their priorities,

including strengthening access to healthcare, promoting policy development that supports healthy communities and individuals, and promoting social change at the systems level, require extensive research and evaluation components. In recent years, its efforts to encourage community-oriented health professions education have produced research findings of importance to the discipline of health services research. The Turning Point Initiative has directed funding toward policy development, bioterrorism, and preparedness research at local, county, and state levels. There is every reason to expect the W. K. Kellogg Foundation to continue to play an important role in these areas.

Judith V. Sayad

See also Access to Healthcare; Association of University Programs in Health Administration (AUPHA); Community Health; Nurses; Primary Care; Public Health; Safety Net; Uninsured Individuals

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KIMBALL, JUSTIN FORD

Justin Ford Kimball (1872–1956) was an educator and healthcare insurance pioneer and innovator, credited with founding the first health insurance plan in the nation, which would ultimately become Blue Cross and Blue Shield. Kimball was born on a farm near Huntsville, Texas, in 1872. In 1890, he earned an undergraduate degree from Mount Lebanon College in Louisiana, and in 1899, he received a master's degree from Baylor University. Kimball undertook postgraduate work at the University of Chicago and attended law school at the University of Michigan. He subsequently worked as a teacher, principal, and superintendent in schools in Louisiana and Texas. Beginning in 1902, he practiced law but returned to educational leadership in 1905.

Kimball proved to be an exceptional administrator, and in 1914, he became Superintendent of Public Schools in Dallas, Texas. He held that position until 1924, when ill health forced him to resign. After his resignation, Kimball remained active as a lecturer and speaker, eventually joining the faculty of Southern Methodist University in 1925 as a professor of education. In 1929, he became vice president of Baylor University, in charge of the Colleges of Medicine and Dentistry, School of Nursing, and the University Hospital in Dallas to provide oversight of the university's medical education and "to shore up the shaky finances" of Baylor University Hospital.

Kimball found that a large share of Baylor University Hospital's unpaid bills were from Dallas schoolteachers. In 1929, almost concurrently with the great stock market crash that sparked the Great Depression, he developed a not-for-profit insurance plan whereby Dallas schoolteachers could prepay, at 50 cents a month, or \$6.00 a year, for 21 days of inpatient care in a semiprivate room at Baylor Hospital. The plan would take effect after a patient's first week in the hospital, with payments being \$5.00 a day. On its first day of subscription, 1,356 teachers signed up for the plan, and by December 1929, 75% of Dallas

teachers were enrolled in the plan. Within 5 years, the "Baylor Plan" provided health insurance coverage for some 408 diverse employee groups, totaling 23,000 members, eventually covering 3 million people within a decade. By 1933, the American Hospital Association (AHA) started regulating and approving similar prepayment plans, and the Blue Cross symbol, a blue Geneva cross known as a universal symbol of healthcare, came into use the following year. During 1944, the Baylor Plan merged into what would become one of the nation's Blue Cross and Blue Shield plans.

In 1939, Kimball, who was 67 year old, retired from Baylor University, but he remained active as a lecturer. He served on the Dallas civil service commission and from 1949 to 1952 was a member of the Texas State Board of Education. He died at his Dallas home in 1956.

After his death, the American Hospital Association (AHA) established the Justin Ford Kimball Innovators Award in his honor. The award recognizes individuals who make innovative contributions in bringing together healthcare delivery and financing.

David J. Ballard and Robert S. Hopkins, III

See also American Hospital Association (AHA); Blue Cross and Blue Shield; Health Insurance; Health Insurance Coverage

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LEAPFROG GROUP

The Leapfrog Group is an initiative that was started by large employers that purchase healthcare. Leapfrog works to create breakthroughs in the safety, quality, and affordability of healthcare. It is supported through its membership base, as well as the Business Roundtable (BRT), the Robert Wood Johnson Foundation (RWJF), and others. The mission of the Leapfrog Group is to facilitate enormous leaps forward in the safety, quality, and affordability of healthcare by supporting informed healthcare decisions of purchasers and consumers and by promoting healthcare that is high in value by realigning incentives and rewards.

Background

In 1998, a consortium of large employers began to discuss how they could collaborate and use their purchasing power to influence the quality and affordability of healthcare. These employers realized that billions of dollars were being spent on healthcare without any evaluation of its quality or its providers. A 2000 national Institute of Medicine (IOM) report, *To Err Is Human: Building a Safer Health System*, estimated that as many as 98,000 hospital patients die each year from preventable medical errors. The report recommended that large employers could use their market leverage to influence the quality and safety of healthcare. The founders of Leapfrog recognized that significant “leaps” forward could be taken to improve patient

safety and quality by rewarding hospitals that implemented substantial changes. In 2000, BRT set aside funding, and the Leapfrog Group was officially created.

The Leapfrog Group has a growing consortium that includes many of the nation’s largest corporations and other large purchasers of healthcare that provide benefits to more than 37 million individuals across the country. Member organizations of Leapfrog agree to make their healthcare-purchasing decisions with the goal of encouraging quality improvement among the providers and consumers involved. Leapfrog estimates that if all hospitals in the nation implemented its first three leaps of recommended safety and quality practices, more than 65,000 lives could be saved, more than 907,000 medical errors could be prevented, and about \$41.5 billion could be saved annually.

Initiatives

The Leapfrog Group is well-known for its Hospital Quality and Safety Survey, which is conducted annually and completed by hospitals on a voluntary basis. The survey measures hospital performance on the use of computer physician order entry, evidence-based hospital referral, intensive care unit staffing by physicians experienced in critical care medicine, and the Leapfrog safe practices score. Leapfrog’s survey goals are based on the following criteria: There is substantial scientific evidence that the safety and quality practices can significantly reduce preventable medical errors; the implementation of these practices is feasible;

consumers can readily benefit from these practices; and health plans, purchasers, and consumers can readily distinguish if these practices are present or absent in selecting their healthcare provider.

In 2008, the survey integrated the first set of hospital efficiency measures using standardized measures from the Joint Commission. The survey also serves as the basis for Leapfrog's Hospital Rewards Program, a pay-for-performance program that assesses the value of patient care by measuring performance along two dimensions—the quality of the care hospitals provide and how efficiently they deliver it.

To fuel the drive toward value-driven health care, Leapfrog developed the Incentive and Reward Compendium, a free database that categorizes and describes financial programs—such as those that reward providers with quality bonuses—and non-financial programs—such as those that reward providers with public recognition. These programs aim to affect hospitals, physicians, health plans, and/or consumers.

Bridges to Excellence and The Leapfrog Group have also formed a partnership to use the strengths of each organization to develop and implement programs that reward healthcare providers. Leapfrog lends its expertise in performance measures and public reporting, while Bridges to Excellence contributes its knowledge of implementing programs that reward healthcare providers for quality improvement.

Purchasing Principles

Leapfrog works to create improvements in the quality of healthcare by building transparency through its voluntary survey, providing incentives and rewards to hospitals that improve the quality of care they provide to patients, and creating consistency and leverage for change by collaborating with other organizations to develop quality and safety initiatives. Leapfrog's member organizations agree to follow four principles when making healthcare-purchasing decisions for their employees: increase awareness and inform enrollees about healthcare safety, quality, and affordability and the importance of comparing among healthcare providers; reward and recognize healthcare providers for making significant advances in the safety, quality, and affordability of healthcare;

hold health plans accountable for implementing the purchasing principles of Leapfrog; and build the support of consultants and brokers to use Leapfrog's principles with their clients.

To promote these purchasing principles, the Leapfrog Hospital Rewards Program, a pay-for-performance program, was launched in 2005 to drive improvements in hospital quality and efficiency for five clinical conditions by rewarding hospitals that demonstrated excellence in sustaining improvements. The five clinical conditions are (1) coronary artery bypass graft, (2) percutaneous coronary intervention, (3) acute myocardial infarction, (4) community-acquired pneumonia, and (5) deliveries/neonatal care. The efficiency measure applies a regional price adjuster to the average reimbursement a hospital receives for a given condition.

Current Issues

Beginning in June 2001, the Leapfrog Group began collecting data on hospitals by surveying urban and suburban hospitals in six geographic regions, which has now grown to 33 regions. The survey of the 33 regions covers more than 1,300 hospitals. These hospitals represent about 58% of all hospital beds in the nation, and they serve over half of the population of the nation. Free access to the ratings of these hospitals can be found at Leapfrog's Web site.

The Leapfrog Group continues to advocate for change by improving the quality and safety of patient care through its member organizations' purchasing power. Leapfrog's efforts have become a driving force in transforming the nation's healthcare system to ensure high-quality care and purchasing based on value.

Jared Lane K. Maeda and Kat Song

See also Health Report Cards; Joint Commission; Medical Errors; National Quality Forum (NQF); Outcomes Movement; Pay-for-Performance; Quality of Healthcare; Robert Wood Johnson Foundation (RWJF)

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LEE, PHILIP R.

Philip R. Lee is an academic who has served as a senior federal health policy official in two administrations. He also is a frequent advisor to federal, state, and local health policy makers.

Born in San Francisco, Lee grew up in Palo Alto, California, and is one of five children, all of whom became practicing physicians. Lee earned a medical degree from Stanford University in 1948. He joined the U.S. Navy and served as a medical officer from 1949 to 1951. From 1951 to 1956, Lee was a fellow at the New York University's Medical Center and Goldwater Hospital. He completed a fellowship at Mayo Clinic from 1953 to 1955 and earned a master's degree from University

of Minnesota in 1955. From there, Lee rejoined the faculty at New York University until he returned to Palo Alto in 1956. There, he worked as an internist at the Palo Alto Medical Clinic, which was founded by his father, Russell Lee, in 1930.

As a practicing physician during the 1960s, Lee joined a group called the Chowder and Marching Society, headed by Lester Breslow. The society met monthly and presented papers on various health policy topics. Also during this time, Lee was one of the founders of the Bay Area Committee for Medical Aid for the Aged. Additionally, he became actively involved in the King-Anderson Bill, which later became Medicare Part A. It was during this time that he became interested in governmental policies and practices.

In 1963, Lee left his medical practice and joined the federal government, becoming the director of health services in the Office of Technical Cooperation and Research in the Agency for International Development (AID). While in that position, he assisted in developing the first federal policies on family planning, malaria control, environmental sanitation, medical education, and the Food for Peace program. Additionally, he worked to better coordinate AID with the U.S. Public Health Service.

From 1965 to 1969, Lee served as the first assistant secretary in the U.S. Department of Health, Education and Welfare (now split into the Department of Education and the Department of Health and Human Services) under President Lyndon B. Johnson. In his position, Lee was involved in a wide range of policy issues, including bioethics, biomedical research, environmental health, family planning, and the education of health professionals. One of his main tasks was to implement the Medicare program, which was passed in 1965.

From 1969 to 1972, Lee served as the chancellor of the University of California, San Francisco (UCSF), where he helped increase the enrollment of minority students, particularly in the health professions. In 1972, while he was a professor in the School of Medicine, he founded the Institute for Health Policy Studies, which was the first of its kind in the nation. Lee served as the director of the institute until 1993, when he retired from UCSF to accept the appointment of Assistant Secretary for Health in the Department of Health and Human

Services under President Bill Clinton from 1993 to 1997. Additionally, Lee served in several other capacities. He was the first president of the San Francisco Health Commission. He served on the Board of Trustees of the Carnegie Corporation and the Mayo Foundation. And he headed the federal Physician Payment Review Commission (PPRC) from 1986 to 1993.

Lee has been honored for his many accomplishments. He received the David Rogers Award from the Association of American Medical Colleges (AAMC) in 1998, the National Academy of Sciences, Institute of Medicine's Gustav O. Lienhard Award in 2000, the American Public Health Association's Sedgwick Medal in 2000, the Henrik Blum Award from the California Public Health Association in 2001, and the National Hero Award in 2002. In 2007, the health policy institute he founded at the University of California, San Francisco, was renamed the Philip R. Lee Institute for Health Policy Studies in his honor.

Lee is the author or coauthor of more than 150 articles and four books. One of his books, *The Nation's Health*, is in its seventh edition. Although he is retired, Lee is currently working on policy issues such as diversity in medical education, financing national health insurance, and evidence- and population-based healthcare.

Amie Lulinski Norris

See also Cohen, Wilbur J.; Diversity in Healthcare Management; Medicare; Public Health; Public Policy

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Philip R. Lee Institute for Health Policy Studies,
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LEWIN GROUP

The Lewin Group is a nationally recognized healthcare and human services management consulting firm. The Lewin Group provides policy-focused empirical research, hands-on technical assistance, and evaluation services to federal, state, and local governments, foundations, associations, hospitals and health systems, insurers and health plans, and medical technology companies.

Background

Founded by Lawrence S. Lewin in 1970, the Lewin Group, which is located in Falls Church, Virginia, recently was acquired by Ingenix, Inc., a leading health information technology company. Lewin's strategic and analytical services aim to help clients improve policy and expand knowledge of healthcare through the integration of evidence-based practices; enact, run, and evaluate programs to enhance delivery and financing of healthcare and human services; deal with shifts in healthcare practice, technology, and regulation; optimize performance, quality, coverage, and health outcomes; and create strategies for institutions, communities, governments, and people to make healthcare and human services systems more effective. Lewin's consultants are drawn from industry, government, academia, and the health professions. Many are national authorities whose strategies for health and human services system improvements come from a personal experience with imperatives for change.

Lewin's policy research work includes both long-term studies and quick-turnaround policy analyses. Federal and state clients and others count on the Lewin Group for their in-depth experience and innovative, analytic approaches.

Modeling Health Reform

The Lewin Group has been a leader in the health reform and coverage arena and is one of the few

independent sources of information on the financial impacts of health coverage expansion and national and state health reform initiatives. The Health Benefits Simulation Model (HBSM), developed by The Lewin Group, is a well-vetted, proprietary microsimulation model of the U.S. healthcare system. The model, based on the Medical Expenditures Panel Survey data and surveys of employers and health plans, provides a comprehensive representation of public and private insurance coverage and health spending. These data enable The Lewin Group to simulate the effect of a wide range of health reform initiatives on major stakeholder groups, including employers, state and federal governments, families, and providers. The model has been used by Republicans and Democrats to analyze a broad range of health reform proposals at both the state and the federal level, including The Lewin Group's independent analysis of the Clinton health reform proposal of 1993, comparative analysis of the proposed health plans of President George W. Bush and Senator John F. Kerry (D-MA) during the 2004 presidential campaign, President Bush's health insurance proposal of 2007, and the Healthy Americans Act introduced by Senator Ron Wyden (D-OR). The Lewin Group has developed comparisons of alternative coverage expansions for organizations such as the Robert Wood Johnson Foundation (RWJF) and the Commonwealth Fund. Lewin also has modeled a wide range of health reform models for individual states, including tax credits, the single-payer model, and individual mandate proposals.

Cost-of-Illness Studies

The Lewin Group's cost-of-illness studies provide information on both the direct medical costs associated with a disease and the indirect costs, such as lost productivity and premature deaths. These costs are estimated from the perspective of society, healthcare payers, and consumers.

Lewin recently completed a study on the national cost of diabetes for the American Diabetes Association. The study estimated the national economic burden of diabetes at \$174 billion in 2007, approximately \$116 billion in additional healthcare expenditures attributed to diabetes and \$58 billion in lost productivity from absenteeism,

reduced productivity, permanent disability, and premature mortality.

In addition, Lewin continues to estimate the economic cost of drug abuse in the United States for the Office of National Drug Control Policy. Lewin has also studied the economic burden of alcohol abuse for the National Institutes of Health (NIH) and is updating these estimates for the Centers for Disease Control and Prevention (CDC) 2008 report. Other studies being conducted include the prevalence and cost of 17 digestive conditions for the American Gastroenterological Association; the cost of obesity, alcohol abuse, and tobacco use for the U.S. Department of Defense/TRICARE Management Activity; the cost of skin disease for the Society for Investigative Dermatology; and the cost of Chronic Fatigue Syndrome for the CDC.

Long-Term Care

Lewin's Center on Long Term Care brings together experts from across the organization to promote systems change for individuals who have long-term care needs due to chronic conditions or disability. The Lewin Group's staff provides policy development support and technical assistance for the U.S. Administration on Aging's (AoA) efforts to reform the nation's long-term care system so that older adults and individuals with disabilities can live independent lives in their communities. The organization also assists states and local communities to understand the implications of the aging baby boom population and its impact on the range of government services, from transportation to housing and healthcare.

Lewin also recently conducted a study documenting the significant number of older adults, particularly among the "oldest old" (persons 85 and older), who have elected to stay in their homes and in residential alternatives rather than move to nursing homes. The findings speculate on the impact this shift will have on the future demand for long-term care. Through the Centers for Medicare and Medicaid Services (CMS)-sponsored National Direct Service Workforce Resource Center, Lewin additionally supported efforts to improve the recruitment and retention of direct-service workers, who help people with disabilities and older adults to live independently.

Healthcare Workforce: Supply and Demand

An adequate supply of healthcare workers is integral to achieving the nation's goal of ensuring access to quality and affordable healthcare. The Lewin Group is helping healthcare stakeholders understand the implications of demographic trends; changes in the healthcare operating environment; and policies and programs on efforts to train, recruit, and retain health workers. Lewin uses a quantitative approach to help decision makers in the public and private sectors deal effectively with health worker supply and demand and related issues, such as workforce management and program design. The Lewin Group has also worked with the Health Resources and Services Administration (HRSA), states, professional associations, health systems, insurers, and others to develop models that project supply and demand for physicians, nurses, and other health workers.

Lisa Chimento

See also Cost of Healthcare; Diabetes; Disability; Healthcare Reform; Health Insurance Coverage; Health Workforce; Long-Term Care; State-Based Health Insurance Initiatives

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Lewin Group: <http://www.lewin.com>

LICENSING

Healthcare professionals are licensed by the government to protect the healthcare consumer and to ensure a minimum standard of quality of care. Most healthcare professionals cannot practice unless they are licensed. The licensing of healthcare professionals in the United States is carried out at the state government level, and it limits who can and who cannot provide care. The federal government, however, also plays a role in the regulation of healthcare providers by coordinating state licensure programs through a centralized database known as the National Practitioner Data Bank (NPDB), which contains disciplinary actions of providers, and by imposing requirements on providers who receive federal reimbursement (e.g., Medicare, Medicaid).

Background

The government sanction of medical practice dates back thousands of years in India and China. In the Western world, King Henry VIII of England in 1518 established a charter to grant licenses to qualified physicians. In the United States, the American Medical Association (AMA) played a pivotal role in the 19th century supporting state enactment of licensure laws for physicians. Between 1874 and 1915, licensing requirements for medical practice were passed in all states in the nation. Often, as one state passed licensing requirements, poor-quality physicians would move to another unregulated state to practice. However, eventually, as all states required licensing, many poorly trained and unqualified physicians left the profession,

which ultimately resulted in better quality of care and increased status of the profession.

The push by the AMA for state licensure served as a model for the licensing of other healthcare professionals. By the 1920s, most states enacted licensing programs for dentists, pharmacists, nurses, and other healthcare providers. Most allied health professionals, including dental hygienists, physical therapists, and emergency medical technicians, were required to receive licensing by 1960. The health professions have generally advocated for state licensure in addition to standardized education and training.

Role of State Licensing Boards

State licensing boards serve as gatekeepers to control the entry of clinical practice. The role of the state boards is to confirm a provider's training and education and to administer a prerequisite examination before allowing providers to engage in clinical practice. The state boards issue licenses to providers who pass the examinations, renew licenses, and enforce the basic standards of the profession. Members of state boards generally consist of individuals in the profession and sometimes include consumer representatives. The state boards may function independently or as part of a state's department of health. State licensing boards operate under statutes and regulations and have oversight by the state legislature. The boards also maintain procedural rules.

The licensing of providers usually entails two components. First, they must have graduated from a school that has been certified in the state desired to practice in as well as pass a state-administered examination. Second, they must also provide the state board with basic information about themselves. The education requirement has allowed for state oversight of education curricula.

The renewal of a license is generally based on not having any disciplinary action against a provider since the period of the individual's last review and fulfilling a certain number of continuing-education units. If a provider, however, has had a disciplinary action against it, it must be given due process that entails a fair proceeding to contest the charges before the state board revokes or suspends its license. The provider must be properly informed of the charges and be given a fair hearing. An

appeal board may determine if proper procedures were followed if a discipline is sanctioned, and the provider may appeal to the courts. Although disciplinary actions are made public, they are usually not widely publicized.

Issues of Licensing

The state licensure of healthcare providers raises several issues. Since licensure is carried out at the state level, there are wide variations in professional standards as well as in the enforcement of those standards. The coordination by states and the federal government on the NPDB is also precarious. Providers with disciplinary action against them may be able to evade enforcement officials and seek licensure to practice in another state.

The use of professional peers on state licensing boards is also an area of contention. Although professional peers have the credentials necessary to evaluate other providers in their profession, serious questions have been raised about the objectivity of such a review process and whether this is really a form of professional self-regulation. There are concerns that professional peer board members may be more interested in maintaining the reputation of their profession or may impose barriers to the entry of new providers to control competition. Furthermore, consumer advocates argue that the low level of enforcement by state licensing boards is indicative of the boards serving the interests of the profession over those of the public.

Future Implications

Licensing continues to play an important role as the cornerstone of ensuring quality in healthcare. However, there remain some concerns over whether licensing is best carried out at the state or federal level and whether the professions are able to adequately regulate themselves. Also, there are questions over whether patients are better protected by government oversight or through economic market forces. For the time being, state licensing remains the foundation for regulating the clinical practice of most healthcare professionals.

Jared Lane K. Maeda

See also American Medical Association (AMA); Malpractice; National Practitioner Data Bank; Nurses; Patient Safety; Physicians; Quality of Healthcare; Regulation

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<http://www.ama-assn.org>
- Council on Licensure, Enforcement and Regulation (CLEAR): <http://www.clearhq.org>
- Federation of State Medical Boards (FSMB):
<http://www.fsmb.org>
- National Council of State Boards of Nursing (NCSBN):
<http://www.ncsbn.org>
- National Practitioner Data Bank (NPDB):
<http://www.npdb-hipdb.hrsa.gov>

LIFE EXPECTANCY

Life expectancy is the average number of years that an individual of a given age is expected to live. Life expectancy may be determined by race, gender, or other characteristics using age-specific death rates or life tables for the population with that characteristic. Life expectancy at birth is often cited, but it can be given for any age group.

For example, in 2005, the life expectancy at birth for the total U. S. population was 77.8 years; for those 65 years of age, it was 83.7 years; and for those 75 years of age, it was 87.0 years.

Health services researchers use life expectancy as a broad indicator of the overall health of a given population. They often compare the life expectancy and health expenditures of nations with various health delivery systems. Although the United States has a higher life expectancy than the global average, it is only slightly higher than the average for developed nations. The United States ranks 48th highest in life expectancy, surpassed by nations such as Japan, Sweden, Switzerland, Australia, and Canada.

History

The English statistician John Graunt constructed the first life table, a statistical table that uses age-specific death rates to determine a group's average life expectancy. Graunt, who is considered the founder of the science of demography and vital statistics, was interested in studying the effects of epidemics on populations. He analyzed the *Bills of Mortality*, which recorded the weekly count of births and deaths in London parishes. In 1662, he published the results of his findings in *Natural and Political Observations Made Upon the Bills of Mortality*.

Edward Wigglesworth constructed the first life table in America in 1793. Wigglesworth used mortality data reported in 1789 from Massachusetts, Maine, and New Hampshire. He estimated the average life expectancy at birth was about 35 years.

Actuaries have been constructing and using life tables for decades to determine the premium rates for life insurance policies based on the average life expectancy of enrollees. Actuaries at the Social Security Administration (SSA) also use life tables to monitor Social Security enrollees. And the National Center for Health Statistics (NCHS) uses life tables to monitor mortality trends in the nation's population.

Recently, the concept of life expectancy has been modified to focus on healthy life expectancy, sometimes called health-adjusted life expectancy (HALE), which extends life expectancy measures by accounting for the health states of populations. In 2000, the World Health Organization (WHO)

reported for the first time healthy life expectancy for its 191 member countries.

Reasons for Increased Life Expectancy

During the 20th century, life expectancy in the United States rose dramatically. In 1900, the average life expectancy at birth for the nation's total population was 47.3 years; by 1999, it had increased to 76.7 years. This increase in lifespan is attributable to many advances in the nation's public health. In 1999, the Centers for Disease Control and Prevention (CDC) identified a number of factors that contributed to the dramatic increase in life expectancy, including vaccinations, control of infectious diseases, safer and healthier foods, healthier mothers and babies, safer workplaces, motor vehicle safety, decline in deaths from coronary heart disease and stroke, and recognition of tobacco use as a major health hazard.

Public health vaccination campaigns in the nation have eliminated many deadly diseases. Because of vaccinations, once common deadly diseases, such as diphtheria, tetanus, poliomyelitis, measles, mumps, and rubella, have been virtually eliminated. And smallpox has been totally eradicated.

Public health efforts led to the establishment of local and state health departments across the nation. These health departments initiated environmental and sanitation programs, such as clean drinking water, sewage disposal, garbage disposal, mosquito control, and educational programs, which decreased exposure to infectious diseases.

Safer and healthier foods were developed. Better food processing has resulted in fewer deaths because of microbial contamination. In addition, foods have become more nutritious; many are fortified to eliminate major nutritional deficiency diseases such as rickets, goiter, and pellagra.

Mother and infant deaths have been greatly reduced by better hygiene and nutrition programs. In addition, there was greater access to healthcare, family planning programs, antibiotics, and technological advances in maternal and neonatal medicine.

Work-related deaths, injuries, and health problems have greatly declined as a result of more safety measures and greater regulation. Once common diseases such as coal workers' pneumoconiosis

(black lung) and silicosis have come under better control.

Engineering improvements in both vehicles and highways and changes in personal behavior, such as the use of safety belts, child safety seats, or motorcycle helmets, and decreased drinking and driving, has resulted in a large reduction in motor vehicle-related deaths.

The discovery of the major underlying risk factors of heart disease and stroke—smoking, diet, exercise, and blood pressure control—has resulted in smoking cessation and blood pressure control programs. There was also improved access to early detection and better medical treatment.

Since the 1964 Surgeon General's report on the health risks of smoking, smoking among adults has decreased, and millions of smoking-related deaths have been prevented. Public health anti-smoking campaigns have resulted in greater public awareness of the major health-related problems caused by smoking.

Future Implications

While the average life expectancy in the United States has risen to nearly 78 years, it seems unlikely that it will continue to increase at a fast pace in the future. Much of the past increase in life expectancy was due to decreases in infant mortality and infectious diseases, and other factors. In the future, any increase in life expectancy will likely be small incremental gains of perhaps a month or two per year. Some future years may even see a slight decrease in life expectancy due to factors such as increased diabetes and obesity.

Xinjian Du

See also Acute and Chronic Diseases; Comparing Health Systems; Epidemiology; Health Disparities; Mortality; Mortality, Major Causes in the United States; Public Health

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[STATS/table4c6.html](http://www.ssa.gov/OACT/STATS/table4c6.html)

World Health Organization (WHO): <http://www.who.int>

LOMAS, JONATHAN

Jonathan Lomas was a faculty member in the department of clinical epidemiology and biostatistics at McMaster University in Hamilton, Ontario, Canada, from 1982 to 1997; Professor of Health Policy Analysis from 1992 to 1997; and inaugural Chief Executive Officer of the Canadian Health Services Research Foundation (CHSRF) from 1997 to 2007. Although Lomas’s undergraduate training was in experimental psychology at Oxford University, his landmark contributions have been as a scholar in the field of health policy analysis and as an innovator in improving the relevance and use of health services research in health system decision making.

Lomas’s scholarly contributions touched on all three “levels of health policy” (as he called them)—clinical policy, administrative/organizational policy, and public policy, but it was his research in the domain of clinical policy that first brought him widespread attention. His most widely cited scholarly article, “Do Practice Guidelines Guide Practice? The Effect of a Consensus Statement on the Practice of Physicians,” was published in the prestigious

New England Journal of Medicine in 1989. His research on administrative and public policy addressed highly topical policy issues such as the regionalization of health services delivery in Canada. His writing about innovative models for priority setting in health services research (“On Being a Good Listener . . .” *Milbank Quarterly*, 2003) and about conducting research in close partnership with health systems decision makers (“Using ‘Linkage and Exchange’ to Move Research Into Policy at a Canadian Foundation,” *Health Affairs*, 2000) has been highly influential among research-funding organizations.

Under Lomas’s leadership, the CHSRF designed its research programs (i.e., the Capacity for Applied and Developmental Research and Evaluation [CADRE] program) to build a critical mass of applied health services and nursing researchers in Canada and to create a supportive environment for these researchers to engage with decision makers. It also designed training and support programs for decision makers, such as the Executive Training for Research Application (EXTRA) program, and a widely emulated 1:3:25 rule for organizing research reports. Its program designs and “linkage and exchange” philosophy have served as a point of reference for many large and small organizations seeking to improve the use of research in decision making in Canada and internationally.

Lomas is also known for cofounding McMaster University’s Centre for Health Economics and Policy Analysis, his scholarly work with the Population Health Programme of the Canadian Institute for Advanced Research (1988–2004), and his service contributions in Canada (Federal, Provincial, Territorial Advisory Committee to Deputy Ministers on Health Services, 1994–1996; Ontario Premier’s Council on Health, Well-Being and Social Justice, 1991–1994; Interim Governing Council and Institute Advisory Board of the Canadian Institute of Health Research, 1999–2004) and the United States (member of the board of directors of the Association for Health Services Research and its successor AcademyHealth, 1999–2005).

He also made an impact through consultancies for the World Health Organization (WHO) and other international agencies in Australia, Indonesia, Myanmar, the Philippines, South Korea, Sri Lanka,

and Thailand. He was a visiting scholar at the University of Gadjah Mada in Indonesia (1990), the University of Sydney and the Department of Health of the New South Wales Government in Australia (1996–1997), the Dutch national research and development agency ZonMw (2004), and the Ministry of Health in New Zealand (2007). In recognition of his scholarly and professional impact, the University of Montreal awarded him an honorary doctorate degree in 2005, and he was elected a fellow of the Royal Society of Canada and the Canadian Academy of Health Sciences in 2006.

John N. Lavis

See also AcademyHealth; Canadian Health Services Research Foundation (CHSRF); Canadian Institute of Health Services and Policy Research (IHSPR); Clinical Practice Guidelines; Epidemiology; Health Services Research in Canada; Public Health; Public Policy

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LONG-TERM CARE

Long-term care (LTC) includes a wide variety of health and support services that are provided to the frail, the elderly, and individuals with chronic disease conditions and disabilities. LTC is largely personal, custodial, and unskilled care provided to those who cannot care for themselves for extended periods of time. The majority of those receiving LTC are the frail elderly who suffer from multiple chronic diseases. In the United States, about 60% of all individuals 65 years of age or older require at least some type of LTC services during their lifetime, and over 40% need care in a nursing home for some period of time. In 2006, there were 37.3 million people in the nation 65 years of age or older, or about one in every eight Americans. By 2030, the number is expected to grow to 71.5 million people, or about one in every five Americans. Although the family is the primary source of LTC, the increasing size of the nation's older population coupled with decreasing family size and high divorce rates will invariably increase the demand for paid LTC services.

The need for LTC services for people suffering from chronic disabilities is often estimated using the criteria of Activity of Daily Living (ADL) or the Limitations of the Instrumental Activities of Daily Living (IADL). The ADL criteria include bathing, dressing, getting in or out of bed, getting around inside, toileting, and eating; and the IADL criteria are light housework, laundry, meal preparation, grocery shopping, getting around outside, managing money, taking medications, and telephoning. According to the National Institute on Aging, in 2006, about 20% of all Medicare enrollees, including 5% who were institutionalized, had limitations in one or more ADLs. However, only about half of those individuals were estimated to be receiving personal care. The majority of those (65%) who received personal care obtained it from unpaid caregivers (i.e., spouse, adult children, other family members, and friends), about 26% received personal care from both unpaid and paid caregivers, and the remaining 8% received personal care from only paid caregivers.

Projected Demand for Paid Care

The demand for paid LTC services is expected to increase sharply in the future because of the growth in the nation's older population. A simulation study conducted by the Urban Institute in 2007 estimates that between 2000 and 2040 the number of older adults with chronic disabilities in the nation will more than double, increasing from about 10 million to about 21 million individuals. Although the study projected an overall declining rate of old-age disability during the period, the total number of individuals with disabilities will more than double simply because of the enormous size of the older population by 2040. This trend is troubling because at the same time that it will be occurring, family size is likely to decline, and there will be rising divorce rates and an increase in female employment rates. As a result, the demand for paid LTC services is projected to increase sharply in the future. The study estimates that the number of old people receiving paid home care will increase from 2.2 million to 5.2 million and the number of older nursing home residents will increase from 1.2 million to 2.7 million individuals.

Financing Long-Term Care

Meeting the projected need for LTC will be a daunting task for both the private and the public sectors, considering that LTC services for older adults already represent a substantial share of the nation's total healthcare spending. In 2005, nursing home and home health care accounted for slightly over 10% of national personal health expenditures, or about \$169 billion. This amount does not include care provided by family or friends on an unpaid basis (often called "informal care"). It only includes the costs of care from paid providers.

The largest share, 48%, of the nation's LTC costs are paid for by Medicaid, a jointly funded state and federal program; state and local governments pay for 19%; and the private sector (through out-of-pocket and insurance premiums) pays 31% of the total LTC costs. However, the federal government pays for LTC through its portion of the Medicaid program and also through the Medicare program. These two sources pay for 50% of the nation's LTC costs, making the federal government the single largest payer for LTC.

Medicare Coverage

Since the implementation of Medicare's hospital prospective payment system in 1983, which encouraged the nation's hospitals to shorten patient length of stays and discharge patients as quickly as possible, nursing homes have seen an increasing number of individuals requiring post-acute rehabilitation. Specifically, Medicare Part A will pay for their care at a skilled-nursing facility (SNF) only if the care occurs within 30 days of a hospitalization of 3 or more days and is certified as medically necessary. Covered services are similar to those for inpatient hospital stays but also include rehabilitation services and medical equipment. However, Medicare does not cover nursing facility care if the individual does not require skilled nursing or skilled rehabilitation services. Although the number of SNF days provided by Medicare is limited to 100 days per benefit period, the average length of stay in an SNF is usually less than 2 weeks. Under Medicare, no copayment is required for up to 20 days; a copayment is required for Days 21 to 100; and after 100 days, the individual pays the total cost.

While SNF care may be viewed as an extension of hospital inpatient care rather than true LTC, home health care has increasingly been transformed into a source of long-term personal assistance for Medicare beneficiaries, especially those with severe functional limitations and cognitive impairment. Both Medicare Part A and B cover part-time or intermittent skilled nursing care and home health aide services, and some therapies that are ordered by a physician and provided by a Medicare-certified home health agency. Specifically, Part A covers the first 100 visits following a 3-day hospital stay or an SNF stay, and Part B covers any visits thereafter. Home health care under Part A and B has no copayment and no deductible.

Medicare Part A covers hospice care for individuals with a terminal illness, generally individuals who are not expected to live more than 6 months. Although Medicare does not consider hospice care to be an LTC service, an increasing number of hospice patients are living well beyond 6 months, and hospices are becoming more like an LTC setting for those with terminal illnesses who are bed-stricken. Hospice services include

drugs for symptom control and pain relief, medical and support services from a Medicare-approved hospice provider, and other services not otherwise covered by Medicare (e.g., grief counseling). Hospice care is usually provided in a patient's home (which may include a nursing home if that is where the patient lives) or a hospice care facility. However, Medicare does cover some short-term hospital and inpatient respite care provided to a hospice patient to allow the usual caregiver to rest.

Medicaid Coverage

Although the number of short stays has increased, the majority of nursing home residents require long-term custodial care. Most nursing home care is paid for by Medicaid and by the resident's own resources. According to the National Center for Health Statistics 2004 National Nursing Home Survey, Medicaid paid for at least some of their care for 65% of all nursing home residents, private/other sources paid for 22%, and Medicare paid for 13%.

During the past decade, a growing number of older individuals have opted to reside in community residential facilities, such as assisted living facilities, board and care, and continuing-care retirement communities, instead of being placed into nursing homes. Currently, an estimated 1 million individuals live in residential facilities, largely financed from their own resources. The public sector has taken note of this trend. States, which have been concerned about the increasing number of Medicaid residents in nursing homes, have started using Medicaid to fund those living at home and in the community through Home and Community-Based Service (HCBS) waiver programs. The primary purpose of such programs is to keep those at risk of being institutionalized in nursing homes at home or in the community. The program provides family members with supplementary services including adult day care services to help them continue to provide care. Some states are also trying to relocate nursing home residents back in the community. As a result of these and other changes, the percentage of total Medicaid spending on nursing homes was reduced to 44% in 2006, and the percentage of spending for home health and personal care increased to 41%.

Dual Eligible Beneficiaries

Some Medicare enrollees also are Medicaid recipients, and they are called *dual eligibles*. For those who are dual eligibles, Medicare covers its set of medical services, while Medicaid pays for the individual's Medicare premiums and cost sharing, and—for those below certain income and asset thresholds—LTC services. The dual eligibles tend to be older, sicker, poorer, and they use more expensive medical services. The dual eligibles have an important impact on LTC spending. Since Medicare covers SNF care, some dual-eligible patients are discharged from hospitals to SNF for LTC services. After Medicare stops paying for their care, the dual eligibles rely on Medicaid to pay for their LTC services. In some cases, noninstitutional options may have been more appropriate, which may have provided better outcomes for the individual and lower costs for both Medicare and Medicaid. Efforts are now being made to better coordinate and integrate LTC services between Medicare and Medicaid.

Private Coverage

Medicare and Medicaid are not ideal providers of LTC. For the most part, Medicare was designed to provide acute care not LTC, and the Medicaid program was designed to provide medical care to the deserving poor in certain limited categories, particularly women and children. Specifically, Medicare only pays for medically necessary SNF or home health care. While Medicare pays for about 18% of LTC, it only pays under specific circumstances. If the type of care needed does not meet Medicare's rules, it does not pay. In terms of Medicaid, individuals with assets and financial resources often do not qualify for Medicaid unless they use up their resources by paying for care and become poor. Furthermore, states apply strict preadmission screening to deter people from being institutionalized in nursing homes.

Because of the many problems associated with Medicare and Medicaid, most people who need LTC end up paying for some or all of their care using their own assets and financial resources. However, LTC is very expensive. For example, based on national averages for 2006, a semiprivate room in a nursing home costs \$171 per day, a pri-

vate room in a nursing home costs \$194 per day, a stay in an assisted living facility (one-bedroom unit) costs \$2,691 per month, the use of a home health aide service costs \$25 per hour, the use of a homemaker service costs \$17 per hour, and a stay in an adult day healthcare center costs \$56 per day.

To pay the costs of LTC, some people purchase LTC insurance. Currently, about 10% of the nation's population purchase LTC insurance. The average annual premium costs for a policy purchased in 2005, across all age groups of buyers and all types of insurance policies, was just over \$1,900. This represents a comprehensive policy (covering both nursing facilities and at-home care) that provides an average of 5.5 years worth of benefits, with a daily benefit payment of \$143. Most policies purchased also included some form of automatic inflation protection.

Other insurance also pays for some limited LTC services. Most Medicare enrollees purchase a Medicare supplemental insurance plan, or Medigap insurance, which is sold by private health insurance companies to cover some of the "gaps" in expenses that are not covered by Medicare. In addition to covering some of the costs of Medicare's copayments and deductibles, some Medigap policies also provide additional benefits such as at-home recovery care.

A reverse mortgage may also be an option for some individuals who need LTC and expect to live in their current home for several years. A reverse mortgage is a special type of home equity loan, where home owners 62 years of age or older receive a loan against their home that does not have to be paid back as long as they live in their home. The home owner receives a lump-sum payment, a monthly payment, or a line of credit against the value of the home without selling it.

Public Policy: Acts Related to Long-Term Care

A number of federal acts are directly related to LTC. Some of the major acts include the Deficit Reduction Act of 2005, the Older Americans Act of 2001, the Millennium Health Care and Benefits Act of 1999, and the Balanced Budget Act of 1997. Each act is discussed below.

Deficit Reduction Act of 2005

The Deficit Reduction Act of 2005 refined the eligibility requirement for state Medicaid recipients by tightening standards for citizenship and immigration documentation and by changing the rules concerning LTC eligibility. Specifically, the period for determining community spouse income and assets was lengthened from 36 to 60 months, individuals whose homes exceeded \$500,000 in value were disqualified, and the states were required to impose partial months of ineligibility. The act also contained a provision allowing for the expansion of a National LTC Partnership program to all states. The goal of the program is to encourage individuals to purchase private LTC insurance. In the program, individuals who exhaust their LTC insurance benefits can retain a greater amount of their assets and still qualify for state Medicaid, without having to "spend down." Specifically, purchasers would be allowed to keep a dollar of assets for every dollar they receive in benefits from the program. The ability to retain additional assets, yet still use Medicaid as a "safety net" if private coverage does not suffice, is an incentive for more individuals to purchase at least a moderate amount of private coverage.

Older Americans Act of 2001

The Older Americans Act of 2001 is one of the most significant laws affecting LTC. It changed the bias toward institutionalizing LTC. In passing the act, the U.S. Congress recognized the family's role in providing LTC. The act has the goal of retaining the family as caregivers of the elderly who desire to be cared for in the home. It provides funding, through state and local Aging Network agencies, to help families and older individuals remain independent within their communities. While there are no specific financial eligibility criteria for Older Americans Act services, they are generally targeted at low-income, frail seniors over age 60 and minority elders and seniors living in rural areas.

Millennium Health Care and Benefits Act of 1999

The Millennium Health Care and Benefits Act of 1999 expanded the Veterans Health Administration's (VHA) programs to increase access to nursing home care and other extended care services to

veterans who do not have service-related disabilities but who are unable to pay the costs of necessary care. For those who qualify, the benefits can provide financial assistance for some LTC costs. Copayments may apply depending on the veteran's income level. The VHA also has a Housebound and Aid and Attendance Allowance Program that provides cash grants to eligible disabled veterans and surviving spouses in lieu of formally provided homemaker, personal-care, and other services needed for assistance in activities of daily living and other help at home.

Balanced Budget Act of 1997

Several provisions of the Balanced Budget Act of 1997 addressed the explosive growth of Medicare's home health care expenses in the early 1990s. Home health care, which in 1989 accounted for only 2.5% of all Medicare Part A expenditures, exceeded 15% of the total in 1996. To stem the growth, the act moved home health care to a prospective payment system, and it discouraged hospital ownership of home healthcare agencies. The act dramatically reduced Medicare's home health care expenditures and utilization; expenditures in the following 2 years after the act's passage declined by 52%, the percentage of Medicare beneficiaries receiving home health care services for the first time declined by about 20%, and the use among those who availed of these services declined by 39%.

Future Implications

The projected future growth in the nation's older population will seriously challenge both the private and the public sectors. With declining family size and high divorce rates, the need for paid LTC services will greatly increase in the future. Many future retirees will likely not have the necessary financial resources to afford the LTC they need. The future strain on the Medicare and Medicaid programs will be enormous. To address these issues, policymakers must develop new innovative ways of financing and providing LTC, which politicians will support and the general public will accept.

Kyusuk Chung

See also Chronic Care Model; Continuum of Care; Disability; Long-Term Care Costs in the United States; Medicaid; Medicare; Nursing Homes; Skilled-Nursing Facilities

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LONG-TERM CARE COSTS IN THE UNITED STATES

Long-term care (LTC) is often viewed as a service involving only the elderly. In reality, individuals of

all ages, including children, nonelderly adults, as well as older persons, use LTC services. Approximately 37% of LTC recipients are under 65 years of age. Individuals in these three age groups can be further subdivided into classes, including those individuals facing physical challenges, persons with persistent and severe mental illness, children with developmental disabilities, adults with intellectual disabilities, persons with some type of dementia, and individuals with some combination of these challenges.

In 2005, expenditures in the United States for LTC services such as nursing home care, assisted living, and home health totaled over \$200 billion. Roughly 72% of those expenditures came from the public coffers, largely the Medicaid or Medicare programs, with payments from private insurance (7.2%), other private spending (2.7%), and out-of-pocket expenditures by individuals accounting for most of the rest of spending on formal LTC services.

Indeed, LTC is an area of healthcare where consumers or their families pay a relatively substantial proportion of the costs of formal care. Historically, for the health services used by the elderly, only expenditures for prescription medications have been more heavily funded by out-of-pocket expenditures. In 2005, out-of-pocket expenditures for LTC financed 18% (\$37 billion) of the costs of all LTC services.

Costs are quite high for those paying for LTC from personal funds, especially when one considers the average income of those frail and vulnerable individuals in need of it. In 2006, the estimated average annual cost of a private room in a nursing home was just over \$70,000. For those who could afford it, a private room in an assisted living facility might cost more than \$30,000 a year for room, board, oversight, and basic services, such as medication assistance, with the potential for substantial additional costs for special services, such as more extensive personal care, medications, and therapies. With an hourly cost of an estimated \$25 per hour for a home health aide, an individual receiving only 4 hours of personal care assistance per day would spend more than \$36,000 a year for such help.

While much attention is focused on public expenditures for care, it is important to emphasize that no matter which group of LTC recipients we

discuss, informal caregivers provide the vast majority of care. Family and friends provide an estimated 80% of all LTC. Informal caregivers typically provide many hours of care each week, and the average duration of caregiving is over 4 years—and usually longer for caregivers of persons with Alzheimer's disease. Nearly half of these caregivers place their own economic status and retirement at risk by reducing or losing employment and income to provide care. The value of unpaid care is difficult to determine, but in 2006, the AARP Policy Institute estimated that the value of unpaid LTC was \$354 billion annually, which substantially exceeded the total expenditures on formal services.

Long-Term Care and the Elderly

The variety of individuals receiving LTC and the variety of settings in which it can be provided make it difficult to succinctly summarize all aspects of its costs. The remainder of this entry focuses on LTC costs for the frail elderly, who constitute more than 60% of those needing LTC services. Special attention is given to the projected LTC costs associated with aging among the baby boomer generation.

High mortality rates and lower life expectancy during the 19th and early 20th centuries kept the issue of LTC off the policy agenda. Life expectancy at birth in 1900 in the United States was only 47 years, and children with profound disabilities and individuals with developmental disabilities had an even more limited life expectancy. The few persons who survived into old age in America were cared for either by their families at home or in the local "poor farms" or "almshouses" supported by local or county governments or charitable organizations. Many of those with persistent and severe mental illness also faced institutional care or relegation to poor farms. But, by 2004, life expectancy at birth was almost 78 years, life expectancy for someone aged 65 years had increased to 84, and life expectancy for someone at 75 years of age had increased to nearly 87.

In the mid 20th century came the passage of the Medicare and Medicaid programs. That legislation placed LTC costs firmly on the policy agendas of the states and the federal government. The Medicaid program, which is jointly funded by the states and the federal government, pays for the vast majority

of LTC costs. In 2005, Medicaid paid just over \$100 billion for nursing home and home care services, almost 49% of the total costs of these services, compared with just over \$42 billion (20%) paid by Medicare for these same types of services.

A major concern of some policymakers has been the transfer of assets by the elderly to younger family members to qualify for Medicaid LTC services. However, the U.S. Government Accountability Office (GAO) analysis of the 2002 Health and Retirement Study data indicated that those elderly most likely to need LTC services had a median annual income of less than \$14,000 and median nonhousing assets of less than \$4,000. Recapture of transferred assets in such a population is not likely to have a significant impact on Medicaid expenditures for LTC.

One of the current policy debates surrounding LTC costs is *rebalancing*. Since the implementation of Medicaid, public funding for LTC has almost exclusively supported the provision of LTC in institutional settings (nursing homes). At the same time, almost all consumers would prefer to receive LTC in a community setting, and public funding agencies want to reduce expenditures for the most expensive type of LTC, nursing homes. Rebalancing is typically thought of as requiring an increase in the proportion of funding going to community-based care while reducing the proportion of funds going to nursing home care. Another alternative, of course, is simply expanding expenditures for LTC and targeting these additional funds for use in other forms of residential LTC and for home- and community-based services.

Rebalancing is currently far from complete. In 2005, almost two thirds of LTC expenditures went to support nursing home care for individuals with severe physical and cognitive impairment. Despite this, the inadequacy of nursing home reimbursement is apparent. The majority of nursing homes are understaffed and thus at risk of being unable to meet the needs of their residents.

Another policy option that many hoped would help reduce the public costs of LTC was LTC insurance. However, LTC insurance has not seen the growth in the number of policyholders needed before it can serve as a substitute for a significant proportion of Medicaid payments to nursing homes. The elderly find it difficult to afford LTC insurance, and younger individuals have shown

little interest in paying premiums now for benefits that they may need in 30 to 40 years.

Dealing With the Baby Boomers

No discussion of LTC costs in this country can be complete without a discussion of what many see as the looming explosion in LTC needs and expenditures as the baby boomer generation ages. Baby boomers include those individuals born between 1946 and 1964. Based on estimates from the Urban Institute's simulations, the number of older adults with disabilities will increase from 10 million to 21 million from 2000 to 2040. The number of elderly receiving paid home care will increase from 2.2 million to 5.3 million, while the number of nursing home residents will grow from 1.2 to 2.7 million. All this will occur at the same time that the number of middle-aged or younger individuals who might serve as informal or formal caregivers will fall because of long-term reductions in the nation's birth rate.

As the more than 70 million baby boomers age, some estimates indicate that Medicaid costs will grow from 3% of the U.S. gross domestic product (GDP) in 2000 to approximately 11% of GDP by 2080. Some researchers argue relatively persuasively that reduced disability in the elderly population could dramatically reduce these projected expenditure levels.

These population dynamics and cost projections have raised serious concern among many analysts and policymakers. The federal government's response to these concerns, at this point, has largely been an attempt to increase individual responsibility by encouraging the purchase of LTC insurance and increased personal savings for LTC costs. The Centers for Medicare and Medicaid Services (CMS) informational campaign for Medicare recipients, titled "Own Your Own Future," is only one example of this approach.

As the baby boomers age, the nation will be faced with a series of difficult decisions. How much of the cost of LTC is the responsibility of society, and how much is the responsibility of the individual? What reallocations of social and personal resources will be necessary to meet the challenges presented by the projected explosion in the number of frail elders who will need LTC? What is an equitable distribution of total LTC spending?

How can we balance spending for the elderly's LTC needs with other pressing social priorities?

However, we might do well to remember that at each stage of its life course the baby boomer generation has presented unprecedented challenges to our society. First, this generation needed expanded public school services; then they needed expanded higher education; and then they needed jobs. At each point, our society successfully reallocated or generated the resources to meet those needs. One can only wonder how this looming challenge will differ from those earlier trials.

Charles D. Phillips and Catherine Hawes

See also Centers for Medicare and Medicaid Services (CMS); Cost of Healthcare; Life Expectancy; Long-Term Care; Medicaid; Medicare; Nursing Homes; Payment Mechanisms

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LUFT, HAROLD S.

Harold S. Luft is a leading health services researcher. He is perhaps best known for his work on how health maintenance organizations (HMOs) achieve cost savings compared with fee-for-service medicine and his discovery of the volume-quality relationship in healthcare—the inverse relationship between the volume of hospital procedures performed and in-hospital patient mortality for certain surgeries and medical conditions.

Luft is the former Caldwell B. Esselstyn Professor of Health Policy and Health Economics and director of the Institute for Health Policy Studies at the University of California, San Francisco (UCSF). In 2008, he became the director of the Palo Alto Medical Foundation Research Institute.

Born in 1947 in Newark, New Jersey, Luft received his bachelor's degree, master's degree, and doctorate from Harvard University, where he specialized in health sector economics and public finance. Prior to joining UCSF in 1978, he was an assistant professor in the Health Services Research Program at Stanford University.

Luft has undertaken research in a variety of areas, including the applications of cost-benefit analysis, the relationship between hospital volumes and patient outcomes, the regionalization of hospital services, HMOs, risk assessment and risk adjustment, quality and outcomes of care, and

healthcare reform in various states and communities. He also has studied the role of large databases and informatics tools to improve healthcare.

Throughout his long career, Luft has authored or coauthored five books and almost 200 scientific journal articles. His most recent book, *Total Cure: Rebuilding the American Healthcare System*, proposes a fundamental restructuring of the nation's financing and delivery of healthcare. He also has served on many editorial boards, including the journal *Inquiry*, and was the coeditor-in-chief of *Health Services Research* from 1997 to 2006.

Luft has received many awards and recognitions for his outstanding contributions to the field. He was awarded the Investigator Award in Health Policy Research from the Robert Wood Johnson Foundation (RWJF) in 2004; the Distinguished Investigator Award from the Association of Health Services Research in 1999; and the William B. Graham Prize for Health Services Research, sponsored by the Association of University Programs in Health Administration (AUPHA) and the Baxter Allegiance Foundation, in 1998. He also was a fellow of the Center for Advanced Study in Behavioral Sciences, the National Science Foundation, and the Carnegie Foundation and a Graduate Prize Fellow at Harvard University.

Luft is a member of the National Academy of Sciences, Institute of Medicine (IOM). He was a member of and chaired the National Advisory Council of the Agency for Health Care Policy and Research (now the Agency for Healthcare Research and Quality). He is a research associate at the National Bureau of Economic Research (NBER). In addition, Luft has served on the board of AcademyHealth. And he also has been a consultant to a number of federal agencies, including the Health Care Financing Administration (HCFA) (now the Centers for Medicare and Medicaid Services [CMS]), the National Institute of Mental Health (NIMH), the U.S. Commission on Civil Rights, and the U.S. General Accounting Office (GAO) (now the U.S. General Accountability Office).

Luft has also been pivotally involved in multidisciplinary postdoctoral training for more than 35 years. He served as the codirector or associate director for three training programs sponsored jointly by UCSF and the University of California, Berkeley.

Ross M. Mullner

See also Health Economics; Health Maintenance Organizations (HMO); Managed Care; National Health Insurance; Public Policy; Quality of Healthcare; Volume-Outcome Relationship

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MALPRACTICE

Malpractice is defined as professional negligence that results in injury or harm to an individual. Although the term *malpractice* can be applied to other professions, the most common reference is in the area of medicine or healthcare. The Joint Commission defines malpractice as “improper or unethical conduct or unreasonable lack of skill by a holder of a professional or official position.” Malpractice arises from the branch of law called tort law or civil law, where a remedy can be provided for the action. This is different from criminal law or penal law, where causes of action lead to prosecution. When malpractice occurs in healthcare delivery, it is referred to as *medical malpractice*, although it can involve any healthcare provider or facility.

This entry focuses first on the elements necessary to establish a claim of medical malpractice. Then, it discusses the incidence of malpractice. Last, this entry addresses the limitations that may occur as a result of medical malpractice claims.

Elements of Malpractice

To make a claim that medical malpractice has occurred, a claimant must establish four elements: (1) duty, (2) breach of duty, (3) causation, and (4) damages. All four of these elements must exist and must be proven for a medical malpractice claim to be satisfied. Unlike criminal actions, where the standard is “beyond a reasonable

doubt,” in civil actions such as malpractice, the standard of proof is “the preponderance of evidence, which means more likely than not,” or 51 on a scale of 100.

Duty

The *duty of care* is a legal obligation that requires that an individual adhere to a reasonable standard of care when performing acts that could cause harm to another. Although the law does not necessarily define the duty of care, its meaning may develop through common law or local customs. For example, physicians generally are said to have a duty of care by virtue of the physician–patient relationship. This relationship may be established when a patient first makes an appointment to receive care and treatment, or it may be established when a physician is consulted to render emergency care and treatment. Hospital or other healthcare facility personnel are said to have a duty of care because they are either employees or contractors for an agent that agrees to deliver services to a patient. Pharmacists also have a duty of care when they can reasonably foresee that their actions or inactions could reasonably cause harm to clients. Although all healthcare employees generally are expected to honor the duty of care for patients under their care, there have been cases where employees have successfully argued that they did not have a duty of care because provision of care would have violated their own ethical principles.

In healthcare, the duty a professional owes to an individual under his or her care is based on

standards of care. Standards of care address the reasonableness of care and hold a professional accountable to deliver care as would a reasonable person with similar training and skills in similar circumstances. This is known as the *reasonable-person standard*.

Standards of care may be defined in a number of ways. For an individual holding a license to practice a profession, the standard may be defined through the elements articulated in a scope of professional practice. This is generally one of the ways by which standards of care can be established for physicians, dentists, nurses, physical and occupational therapists, and other similarly credentialed individuals. Standards of care also may be established by state laws, by accrediting and professional associations, and through organizational policies and procedures that govern how care is to be rendered.

Depending on the locale, standards of care may follow national standards or be based on local customs and practices. If a national standard is applied, this means that the reasonable-person standard would be based on what similarly trained individuals with similar skills would do under the same conditions anywhere in the United States. On the other hand, if a local standard is applied, the standard would reflect what similarly trained individuals would be expected to do in communities that have the characteristics of the community where the care was rendered. Since most health-care professionals are expected to be educated to deliver care anywhere, it is more common to find a national standard of care applied.

In determining the applicable standard of care for specific actions of a professional, there is an expectation that if a professional carries out a task *requiring* special knowledge and skill, she or he will be evaluated as if she or he *possessed* the requisite knowledge and skill to perform the task. For example, if a resident physician performs a procedure such as insertion of a chest tube and causes the patient harm, that resident will be judged by the standards that govern the insertion of a chest tube by a fully trained physician in the appropriate medical specialty. If those reasonable-person standards are not met, the resident will be deemed to have deviated from acceptable standards of practice.

The issue of “reasonable person” often emerges when more than one group of professionals

possess the knowledge and training to carry out a specific role. This can occur, for example, when advanced-practice nurses, physician’s assistants, or other similarly credentialed individuals perform functions that had previously been only in the scope of physician practice. In these cases, the other professionals will be held to the same standard as that expected of the physician.

Breach of Duty

A *breach of duty* occurs when the care rendered is unreasonable or fails to meet the reasonable-person standard of care previously described. In medical malpractice, an expert witness is generally called upon to help establish the applicable standard of care and then to testify as to whether the healthcare professional met or breached the standard established.

There are three common legal terms that relate to the manner in which a professional might fail to meet the applicable standard: (1) nonfeasance, (2) misfeasance, and (3) malfeasance. *Nonfeasance* refers to the failure to do something that was expected. For example, if the applicable standard of care for a particular hospital indicates that a medical patient’s vital signs are to be taken every 4 hours, failure to take them at that interval as a minimum would constitute nonfeasance. Similarly, if a patient had laboratory tests ordered and the laboratory, although able, failed to collect the necessary specimens, that would also be considered nonfeasance. Nonfeasance is also referred to as an *error of omission*. Failure to act or nonfeasance, in itself, however, does not constitute malpractice.

Misfeasance occurs when there are errors due to mistakes or carelessness. Medical errors such as wrong-site surgery, administration of medication or treatments to the wrong patient, failure to adequately respond to information about changes in a patient’s medical condition, or prescribing medications that may be contraindicated based on a patient’s other medications or medical history are examples of mistakes or carelessness. These types of errors are also referred to as *errors of commission*. In its report *To Err Is Human: Building a Safer Health System*, the national Institute of Medicine (IOM) identifies the types of errors that commonly occur in healthcare and establishes strategies to improve communication between healthcare workers as an approach to

reducing these errors. In addition, the Joint Commission has identified strategies to improve institutional responses to *sentinel events*, those instances of misfeasance that lead to death or serious injury. Although most of the breaches of standards of care that lead to claims of malpractice come from errors and mistakes that are deemed misfeasance, not all misfeasance will lead to sustainable claims of malpractice.

Malfeasance is intentional wrongdoing. It occurs when an individual or group does something that is legally or morally wrong. An example of intentional wrongdoing in healthcare might be filling a patient's prescription for an expensive medication with a placebo yet charging the patient or the health insurance company for the medication that was ordered. At a time when the cost and quality of healthcare are under intense scrutiny, it has been argued that health insurance company actions denying access to needed costly services for subscribers is also a form of malfeasance. Although malfeasance can result in allegations of malpractice, the intentional wrongdoing often makes this a criminal offense.

Causation

The third element that is necessary to establish a claim of malpractice is that the breach of duty or failure to meet the prescribed standard of care must be the direct cause of injury to the patient. This is often the most difficult element to prove in a lawsuit that arises out of an act of negligence. To satisfy this element, the plaintiff or injured party must prove that but for the actions of the healthcare provider, the injury sustained would not have occurred. Causation is attributed based on the concept of probability. To satisfy this element, an expert witness must be able to state to a degree of reasonable probability (51%) that the injury was caused by the breach of standard of care.

Major discrepancies can exist between the plaintiff's and the healthcare professional defendant's positions about causation even if there is agreement that the professional did not meet the applicable standard of care. For example, a nurse providing care to a mother in labor may have incorrectly read the fetal monitor strips. Although the nurse did not recognize some of the changes on the strip, this error may not be deemed to have

caused an injury when the infant was born with a congenital malformation. However, an expert witness for the plaintiff might allege that the failure to correctly read the fetal monitor strips led to a delay in the delivery of the infant, which further compromised the infant's condition at birth.

Sometimes there are areas of disagreement about causation depending on the types of healthcare providers involved and the applicable scopes of practice. For example, if a nurse saw that a patient was not responding to a particular treatment or medication and communicated that to the physician and the physician delayed getting to the hospital to care for the patient, it may not be possible to attribute responsibility to the nurse for the delay. However, if the nurse saw that the patient was not responding to treatment and communicated it only in the medical record, without making the physician aware of the problem, then he or she could be judged with a reasonable degree of medical probability to have caused the injury that occurred to the patient as the result of delayed medical care.

Damages

The final element that must be satisfied in a case alleging malpractice is that damages have occurred. To recover damages, a plaintiff must establish that he or she suffered physical, financial, or emotional injury as the result of the healthcare professional's deviation from the acceptable standard of care. If a plaintiff is able to establish that all the elements of malpractice have been satisfied and a judge or jury agrees with this determination, a monetary settlement is imposed to compensate for the injuries sustained.

There are three types of damages that may be awarded to a plaintiff: (1) economic, (2) noneconomic, and (3) punitive. Economic damages are the result of actual costs or financial losses sustained by the plaintiff or his or her family because of the negligence. These may include the cost of additional or subsequent care associated with any residual impairment, lost wages of the individual or of a family member who has had to provide care to the injured individual, and estimations of future care costs.

Noneconomic damages are those damages that the law assumes to accumulate from the

consequences of the negligent act. The plaintiff can be compensated for emotional stress, interference with his or her enjoyment of life, and what has been called pain and suffering. Although some jurisdictions have made efforts to limit awards for noneconomic damages, they still constitute a significant amount of the damage recovery for a plaintiff.

Punitive damages are what are called punishing damages: Punitive damages are awarded to punish a wrongdoing that is outrageous in character. One of the legal terms used when a request is made for punitive damages is that the act represented a *reckless disregard* for the safety and well-being of the injured party or that the care rendered was incompetent. Two examples of acts that could lead to the award of punitive damages are providing health care when impaired by drugs or alcohol or failure to provide care for a patient despite repeated requests to be physically present. Hospitals can also be charged with punitive damages when they continue to grant privileges to a staff member who has acted in the manner described above. In addition, hospitals have been charged punitive damages for holding themselves out to the community as offering a particular type of service but not delivering it in a way that meets the appropriate standard of care. For example, if a hospital says that it does open-heart surgery but does not have trained and available support staff, an award of punitive damages could result from the injury or death of a surgical patient because of the inappropriate staffing. Although punitive damages are often requested in malpractice cases, they are infrequently awarded. However, when they are awarded, they can be significantly higher than the total of the economic and noneconomic damages awarded. In some jurisdictions, health malpractice insurance companies are prohibited from covering the cost to a defendant related to the award of punitive damages.

Incidence of Malpractice

Although the actual number of claims for malpractice is unknown, there are data that suggest that patient injuries occur too frequently. In 1999, a national IOM report estimated that as many as 98,000 individuals die in the nation's hospitals each year as a result of medical errors. This number

was similar to that reported in earlier studies. A 1984 Harvard research study found that 1% of a representative sample of all patients hospitalized in New York State experienced injuries and one quarter of that number died. If the New York findings were extrapolated nationwide, the numbers would represent more than 234,000 patient injuries and 80,000 deaths per year from negligence. A 2006 follow-up of the 1999 national IOM study found that 1.5 million people were harmed due to medication errors alone. More than half of these errors occurred in long-term care facilities with the remainder divided between outpatient facilities treating Medicare recipients and hospitals.

Despite the number of injuries and deaths reported, fewer than 1% of physicians nationwide have had claims made against them for malpractice. Although this number is rising, the scope of the involvement of physicians and other professionals remains small. About one half of all cases brought to trial in 2002 in the 75 largest counties in the United States involved cases against surgeons, and one third were against nonsurgeon physicians. In the same report, 90% of plaintiffs alleged death or permanent disability.

Although there are significant errors that can and do occur in the delivery of healthcare, the rate of success in winning a malpractice claim in court is low. Although almost 52% of other civil torts are settled in favor of the plaintiffs, in medical malpractice cases that number drops to 27%.

Resulting Limitations

A major concern with medical malpractice is that the increasing numbers of claims, the costs associated with defending them, and the sizes of the awards when the claims are successful have led to limitations in access to healthcare. The loss of access is not related to the inability of patients to pay for care but rather to decisions by professionals to leave practice completely, leave specialty practice, or limit the types of medical conditions that they are willing to treat. In the past several years, for example, many obstetrician-gynecologists are limiting their practices to gynecology only, and neurosurgeons and other subspecialists are limiting the sizes of their practices or are refusing to perform complex surgical procedures. In many cases, these decisions are made due to the

high cost of malpractice insurance coverage. In other cases, the decisions are made due to the high cost of emotional investments in refuting claims that the professionals believe are unjustified.

Rising medical malpractice insurance premiums coupled with the growing number of uninsured or underinsured individuals nationally may be a prescription for disaster. Many individuals who lack adequate health insurance coverage have limited access to care and do not appropriately manage their chronic medical conditions, nor do they receive preventive care. When they do seek needed care, often their disease conditions are more advanced and complex, hence healthcare providers are at increased risk of making errors. It is these errors that lead to future claims of malpractice and a cycle that many believe is out of control.

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See also American Hospital Association (AHA); American Medical Association (AMA); Clinical Practice Guidelines; Cost of Healthcare; Institute of Medicine (IOM); Joint Commission; Medical Errors; Quality of Healthcare

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- Health Care Choices: <http://www.healthcarechoices.org/profile.htm>
- Joint Commission: <http://www.jointcommission.org>
- National Practitioner Data Bank (NPDB): <http://www.npdb-hipdb.hrsa.gov>
- Physician Insurers Association of America (PIAA): <http://www.piaa.us>
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MANAGED CARE

Managed care is a complex system that involves the active coordination of and arrangement for the provision of health services and the coverage of health benefits. The term *managed care* was coined in the 1980s to name the array of emerging health insurance products that were evolving in response to skyrocketing healthcare costs. To differentiate these new products from traditional insurance, commercial insurers adopted the generic term *managed care* to describe health benefit products that attempted to control the cost of care by restricting the choice of providers or the use of medical services. Today, it encompasses a broad spectrum of organizational structures and benefit plans such as (a) health maintenance organizations (HMOs), (b) preferred provider

organizations (PPOs), (c) point of service plans (POS), (d) individual practice associations (IPAs), (e) exclusive provider organizations (EPOs), and (f) consumer-directed healthcare (CDH).

The exact nature of managed care is constantly evolving in response to the changing demands of consumers, employers, and regulators. There are three key components of managed care: (1) the network or contractual relationship with healthcare providers, (2) the oversight or coordination of medical care, and (3) the structure of the covered healthcare benefits and copayments. Early managed-care plans were nothing more than networks of providers who agreed to accept lower reimbursements to be included in a plan's network of preferred providers: hence, preferred provider organizations or PPOs. There were benefits or financial penalties if the insured did or did not use a preferred provider. Later on, managed-care organizations added medical-management initiatives such as preauthorization of services and mandatory second opinions. In response to rising political pressures, medical management has evolved away from prior authorization to focus more on care coordination and disease management. Recently, financial incentives and disincentives have taken the forefront in efforts to influence healthcare costs, taking the form of CDH. CDH uses an array of benefit designs with higher copayments, higher deductibles, or both to empower consumers to more effectively manage their healthcare.

Contracting and Networks

Provider contracting was the easiest and therefore the first component of managed care to be implemented. Insurers began requiring providers who wanted to be included in their network of preferred providers to agree to negotiated discounts off their standard rates. Prior to the advent of PPOs, most hospital services were being reimbursed at 100% of the billed charges. These fees were loosely based on cost plus some percentage above the estimated cost. This methodology actually encouraged higher charges and contributed to the rapid escalation of healthcare costs.

Physicians and other healthcare providers had been reimbursed at billed charges or community-average rate, known as *usual, customary, and reasonable* (UCR). Early PPOs simply negotiated a

lower reimbursement, usually taking an additional 10% or 20% off the billed or UCR fees.

Whereas the discounting of fees yielded some initial cost relief, it did not change the inherent dynamics; each insurer developed different contracting strategies to try to affect hospital costs. Most hospitals preferred a variant of fee-for-service. Thus, the most common arrangement was a greater discount off the billed charges. Under some contracts, facilities would agree to a flat, daily rate (per diem). Initially, these rates were all-inclusive for all levels of care. Eventually, per diem contracts became more sophisticated, and the rates were negotiated based on the complexity of the service provided, with higher rates for more complex services such as intensive care units, maternity, pediatrics, and so on. As technology and costs advanced, per diem contracts began to include carve-outs for high-cost devices (e.g., implantable pacemakers) and medications.

Another method of facility reimbursement—developed and implemented by Medicare in the mid-1980s—was based on Diagnostic Related Groupings (DRGs). Facilities received a fixed reimbursement for all anticipated services based on the expected average cost of care for a patient with a specific discharge diagnosis. DRG payments fundamentally changed the dynamics of hospital reimbursement. Once hospitals were no longer reimbursed on a cost-plus basis, they began to address the different factors that influenced the cost of care in their facilities. Hospitals instituted utilization reviews of patient stays to identify and address the excessive length of hospitalizations. Hospitals also implemented pharmacy and therapeutic committees to identify opportunities to lower medication and medical-device costs. These efforts led to shorter lengths of hospitalization; increased use of lower-cost, generic, and therapeutically equivalent medications; and greater standardization of implantable medical devices and appliances.

A few hospital systems were so confident in their ability to manage costs that they began taking the risk of *global capitation* for the inpatient and outpatient care they provided. Some hospitals established their own health plans; others negotiated full-risk contracts with insurers. Although few of these contracts and health plans remain, the collective efforts of hospitals to manage their cost

of care have resulted in shorter lengths of hospitalization and a more efficient use of resources.

Although relatively rare, organ-transplant services were an early focus of managed-care organizations due to their high cost, wide variation in cost, and variation in the outcomes for similar transplant services across the country. Often, the higher-cost facilities were achieving less favorable outcomes with lower survival rates. In an effort to achieve better outcomes for lower costs, insurers began limiting coverage for transplants to preferred facilities. These preferred facilities were often referred to as *centers of excellence*. Eventually, preferential contracting for centers of excellence expanded to include other complex medical procedures as well as some high-volume or high-cost cardiac procedures.

To encourage patients to seek care at these preferred centers of excellence, insurers would usually cover patients' additional travel and housing expenses. In addition, health coverage plans were often designed to waive or limit patient cost sharing if services were obtained at the insurers' preferred centers. Initially, each insurer developed his or her own list of centers of excellence based on individual criteria. However, as the process spread, specialty medical societies and academic medical centers became involved in developing criteria and tracking outcomes. This led to increased accountability and more transparency.

Medical Management and Care Coordination

A 1986 RAND Corporation Report suggested that one third of medical procedures were unnecessary. This perception of overuse became an early focus of managed care. Initial efforts to influence the care provided included (a) mandatory second opinions for elective surgery, (b) prior authorization for elective procedures and diagnostic tests such as CT scans, and (c) limiting the networks of medical specialists. Prior authorization programs were implemented to reduce the use of high-cost, frequently ordered procedures and to ensure that patients were referred to in-network preferred facilities and providers.

In addition to prior authorization of elective hospitalizations, hospitalizations were reviewed against external criteria and benchmarks. The

clinical criteria for determining the medical need for ongoing hospitalization that were developed by InterQual, Inc. were the most commonly used criteria by hospitals and were adopted by the Medicare program in 1999. InterQual's criteria did not set an expected length of stay for a hospitalization; rather, they assessed whether a patient needed to remain at a particular level of care (e.g., intensive care or hospitalization) based on the treatment and services the patient was receiving.

Health plans tended to use the inpatient care guidelines developed by Milliman and Robertson, Inc. (now Milliman, Inc.) in the late 1980s. The Milliman care guidelines assigned an expected length of stay for each hospitalization based on an optimal outcome. The guidelines were evidence based and reviewed by expert panels of physicians. The Milliman care guidelines specified the expected progression of hospitalized care for specific medical and surgical procedures. Before the Milliman guidelines were introduced into a market, the actual length of hospital stays was usually significantly longer than the optimal length specified by the guidelines. Initially, extended hospitalization due to a delay in care would result in denial or carving out of hospital days—that is, nonpayment of hospital charges for the excess days; within 6 to 12 months, hospitalization lengths of stay shortened, approaching the guideline targets. Initially, denial of payment for hospital days accounted for a small portion of the resultant savings (5–10%). Most of the savings came from shorter hospitalizations due to the changes in practice patterns brought on by the clinical guidelines.

Once physicians and hospitals modified their practice patterns to conform to the guidelines, the denial of payment was minimal (2–3%), and there was marginal subsequent decrease in hospitalization lengths of stay. This lack of ongoing improvement often called into question the need for continuing inpatient utilization management programs. This tension intensified in the late 1990s when public and political perceptions of managed care soured. As a result, many insurers scaled back their inpatient utilization management programs.

Outpatient utilization management programs, although effective, did not result in such clear-cut savings. The major impact was not through denial

of services, which averaged 2% to 4%, but rather was due to a reduction in the number of services requested by providers due to their perception of oversight, the *sentinel effect*. In the inpatient setting, the sentinel effect was demonstrated by the shorter length of hospitalization. In the outpatient setting, it was more difficult to measure the impact: As the sentinel effect resulted in a reduction in the services requested, it was measurement of a nonevent. The impact of the sentinel effect was believed to be 2 to 3 times greater than the effect of the actual denials. However, as most insurers did not have detailed authorization statistics to measure the impact of changes in the utilization management programs, their effectiveness was often underestimated.

Even with the streamlining and automation of these programs, they often cost 1% to 1.5% of premiums. Ignoring the sentinel effect savings of 4% to 9% and accounting only for the savings from denials, the net savings from these utilization management programs was in the 1% to 3% range, which was often thought to be too little to justify the administrative costs and the negative marketing impacts. In response to a public and political backlash against managed care in the late 1990s, many insurers reduced or eliminated their utilization management programs, choosing instead to influence use through increased financial cost sharing and deductibles. By eliminating their utilization management programs, insurers also took themselves out of the unenviable role of trying to control healthcare costs by managing the demand for services. Instead, insurers attempted to influence healthcare costs through higher copayments, greater cost sharing, and higher deductibles.

By increasing consumers' out-of-pocket costs for healthcare services, insurers and employers hoped to slow the rise in healthcare costs by discouraging unnecessary care. However, there is concern that higher deductibles and cost sharing may have a negative impact on health outcomes by discouraging early intervention and preventive care. For commercial and Medicare populations, there is greater emphasis on managing use through financial disincentives and cost sharing than through robust utilization management programs, one notable exception being in the area of managed Medicaid.

Disease and Care Management

In the 1970s and 1980s, some academic medical centers, large medical groups, and staff- or group-model HMOs had multidisciplinary specialty clinics that focused on a single condition or disease (diabetes, cystic fibrosis, anticoagulation, etc.). These programs were predominantly disease focused and institution based and were developed to streamline the operational aspects of a clinic visit.

Health plans and insurers developed *disease management* programs in the early 1990s to lower hospitalizations and emergency room visits for high-use patients with specific diseases, hence the name *disease management*. Individuals were identified for enrollment in disease management programs by retrospective claims reviews or by provider referrals.

Nurse case managers, pharmacists, and physicians would review hospital medical claims and pharmacy records to identify opportunities for intervention to prevent repeat hospitalizations. A key focus of these programs was educating patients and their families so that they could better understand and manage their illness. These programs would emphasize the (a) importance of following treatment recommendations, (b) early recognition of exacerbations and complications, and (c) methods for preventive intervention.

Numerous studies documented the lack of standardization of care and the slow adoption of national treatment guidelines by physicians. Disease management programs were one method used by managed care to disseminate and encourage the use of evidence-based guidelines. By adopting and promoting national guidelines to patients and physicians, disease management programs attempted to improve health outcomes through greater compliance with the recommended treatment guidelines. Managed-care organizations could identify individuals who met the criteria for inclusion in a disease management program from medical claims data, hospital admissions records, emergency department visits, and pharmacy claims. Once the individuals were identified, nurse case managers and pharmacists would review their medical histories and claims data to assess if their care was in compliance with the guideline recommendations. If changes in treatment protocols were needed, a nurse, pharmacist or physician would contact the

individual's treating physician to obtain additional information and review the recommended guidelines. If necessary, a nurse case manager or a physician could also contact the physician to discuss additional intervention, such as a consultation with a specialist or more frequent physician visits. Initially, disease management programs for asthma and congestive heart failure were very successful in encouraging adoption of the guidelines, improving outcomes, and reducing costs.

Disease management programs continued to evolve, increasing the number of diseases covered, the scope of the interventions, and the comprehensiveness of the interventions. Disease management programs became more proactive in identifying candidates for their programs by using sophisticated predictive-modeling software in their analysis of medical claims, pharmacy, and laboratory data. Predictive modeling allowed disease management programs to identify individuals who were at greater risk for complications from their illness and to initiate interventions to prevent costly treatments for complications and hospitalizations.

During the past decade, traditional disease management programs have expanded beyond a single-disease focus to encompass the individual's overall healthcare needs. As a result, the term *disease management* has transitioned to *care management* to signify these changes. The options for intervention have also greatly expanded. Current care management programs provide a wide array of education options, from quarterly newsletters to comprehensive Web-based educational offerings. Interventions may be as simple as prescription refill reminders or may include ongoing home-based monitoring of symptoms and an expanding array of biometric information such as blood pressure, weight, and blood oxygen saturation. By identifying early changes in their conditions, individuals, nurse case managers, and physicians can intervene early and prevent or minimize exacerbations of the conditions.

Whereas the scope of care management programs has expanded, the emphasis has remained on improving health outcomes through greater standardization of care in compliance with evidence-based medical guidelines. A RAND Corporation study, in 2003, estimated that patients with chronic illness received only 55% of the care recommended by the established national guidelines. Another

study, conducted by the Dartmouth Atlas Project, suggests that 30% of U.S. healthcare costs could be saved by increased standardization of care, emphasizing preventive care, and focusing on managing chronic disease.

Medicaid Managed Care

One area in which managed care has continued to grow is Medicaid. Since the early 1990s, state Medicaid programs have turned increasingly to managed care to improve access to care and to contain costs. Many states have enrolled sizable portions of their Medicaid beneficiary populations in some form of managed care. As Medicaid programs provide health coverage to individuals and families with low incomes, the copayments and beneficiary out-of-pocket expenses are minimal. Unlike commercial programs in which managed-care organizations have attempted to substitute financial cost sharing to control costs, Medicaid managed care has continued to emphasize utilization management and disease management programs to achieve savings. Although the nature and composition of these utilization management programs vary greatly by state and by company, the majority of their cost savings result from reduced inpatient use and pharmacy expenses.

Future Implications

Over the past 30 years, managed care has undergone a dramatic evolution. The term *managed care* now represents such a broad array of products, services, and interventions that it nearly defies explicit definition. Managed care can broadly be described as any strategy of organizing healthcare delivery to influence cost. Another way to define managed care is to describe what it is not—unmanaged care: unrestricted healthcare coverage that allows the beneficiary to see any healthcare provider for any service at any time without any financial consequences.

As healthcare costs continued to rise, the government, payers, and individuals sought solutions and alternatives. Managed care offered consumers expanded coverage and lower out-of-pocket expenses with some restrictions on access and limitations on use. It offered employers price moderation and insulated consumers from the true

financial costs of their healthcare. Managed care's expansion of coverage for preventive services, well-child examinations, prenatal care, immunizations, pharmacy services, and disease care management programs went from being new and innovative programs to basic requirements of health insurance coverage.

In part as a result of managed care's success in expanding covered benefits, controlling healthcare costs, and financially insulating consumers from the cost of their care, there was a backlash against any constraints or restrictions on individuals' healthcare desires: In the face of managed care's successes, people questioned whether such restrictions were necessary or appropriate. Managed care became the scapegoat for rising healthcare costs and Americans' reluctant recognition that societal resources for healthcare were not unlimited.

In response to political and marketplace pressures, managed care developed new strategies and products that imposed fewer restrictions and gave consumers greater control along with greater financial responsibility for their health care. These consumer-directed products substituted the individual's willingness to pay for managed care's medical-necessity criteria. For a price, this approach removed managed-care programs from the process of making decisions about whom individuals could see or what care was medically necessary and allowed unimpeded access to care. Individuals with sufficient financial means can access all the care that they desire; conversely, a greater number of Americans are deciding what healthcare they get based on what they can afford.

Although CDH has been a politically successful strategy, rising healthcare costs continue to erode health insurance coverage. The proportion of employers offering health insurance coverage has declined to 60% in 2006 from 69% in 2000. Employers that continue to offer health coverage are requiring employees to pay a higher portion of health insurance costs through higher premium contributions, increased copayments, and larger deductibles. All these changes are leading to a rising number of uninsured individuals as people are unable or unwilling to pay these higher out-of-pocket costs. With the demand for healthcare services in the United States continuing to grow faster than our ability to pay for them, it is clear that the future will require trade-offs: Will healthcare

coverage be affordable and accessible or will there be restrictions and limitations? Are individuals entitled to all the healthcare services they want? Should everyone be guaranteed the healthcare they need? Regardless of the payment mechanism—single payer, nationalized health system, or the current model—some form of managed care will likely remain.

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See also Carve-Outs; Case Management; Consumer-Directed Health Plans (CDHPs); Disease Management; Health Maintenance Organizations (HMOs); Medicaid; Preferred Provider Organizations (PPOs); Primary Care Case Management (PCCM)

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 Disease Management Association of America (DMAA):
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 Henry J. Kaiser Family Foundation (KFF):
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 InterQual, Inc.: <http://www.interqual.com>
 Managed Care Museum:
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 Milliman, Inc.: <http://www.milliman.com>
 RAND Corporation: <http://www.rand.org>

MARKET FAILURE

A market failure exists in the healthcare market when the allocation of goods or services is not efficient—an *allocative inefficiency*. Efficiency is measured by the concept of *Pareto efficiency*, a situation where goods or services have been allocated among members of society in such a way that they cannot be reallocated so as to improve the welfare of at least one member without reducing the welfare of others. A *perfectly competitive market* is a hypothetical ideal market in which there are (a) a large number of buyers and sellers in the market, (b) free entry into and exit out of the market, (c) homogeneity of the goods or services, and (d) perfect knowledge. A perfectly competitive market is an efficient market and the yardstick against which economists and others measure whether a *market failure* exists. A market failure is problematic because it results in a market transaction that is socially inefficient—that is, where the market price does not equal the marginal cost and where potential welfare gains to trade exist but are not achieved. In this entry, the common types of market failure in healthcare are explained, and then potential solutions to these failures are discussed.

Types of Market Failure

The healthcare market exhibits a number of properties that deviate from a socially efficient market. The most significant characteristics of the healthcare market that result in a market failure include (a) the presence of *market power*, (b) information

problem of *uncertainty*, (c) *asymmetric* information, and (d) the existence of positive and negative *externalities*.

Market Power

Market power exists when an individual firm has the ability to influence the market price of a good or service with the result that the price exceeds the marginal cost of the good or service. Market power violates the assumption that a sufficiently large number of sellers exists to guarantee that each individual seller is a *price taker* in a perfectly competitive market. Market power includes situations ranging from imperfect competition, in which multiple sellers compete against each other and each has some influence over the price, to a monopolistic market, in which there is only one seller and this seller has control over the entire market. The presence of market power leads to market failure because of *deadweight loss*—that is, a loss to society due to a market price that is greater than and a market quantity that is less than the market price and quantity in an efficient market.

A classic example of a monopoly in the healthcare market is the market for a drug that is covered by a patent. With a patented drug, only one manufacturer has the legal right to produce the drug until the patent expires, creating a monopoly market until the patent's expiration. As a monopolist, the manufacturer will charge a price that exceeds the efficient price (i.e., the price that would exist in a perfectly competitive market) and sell a quantity of the drug that is less than the efficient quantity.

More commonly, firms may have *monopoly power*, a situation in which there are multiple sellers of a good or service but one seller can increase its price and still maintain at least some of its market share. Both physicians and hospitals exercise varying degrees of monopoly power. A physician could increase his or her fee for an office visit, for example, and still keep some patients. Whereas some patients may decide to go to a different physician after the fee increase, other patients will remain at the physician's practice. This ability to increase fees without losing all the firm's business is market power. Again, because an efficient market means that sellers are price takers, this is a clear violation of a perfectly competitive assumption.

Uncertainty

Uncertainty about an individual's future demand for medical care is an information problem that leads to a market failure in the healthcare market. The unpredictability of illness creates uncertainty regarding when healthcare will be needed, what services will be required, and how much the care will cost. Uncertainty creates a market failure because consumers (i.e., patients) do not know the type or quantity of services that they will need and producers (i.e., providers) do not know the type or quantity of services that they will need to provide.

Uncertainty abounds in healthcare. The occurrence of illness is largely unpredictable. Once an individual becomes ill, the diagnosis is not always known with certainty. Clinical symptoms such as fever, cough, abdominal pain, and shortness of breath are symptomatic of many illnesses. The optimal treatment also may not be certain. Many illnesses can be treated in multiple ways, and the outcomes are not perfectly tied to these treatments. Individuals would like to insure against all these types of uncertainty; however, a market does not exist for all of them.

Asymmetric Information

A second information problem in the healthcare market is asymmetric information. Asymmetric information is a situation where one party in a relationship has more information or more accurate information than another party. This inequality of information violates the perfectly competitive assumption that all parties involved in a transaction have perfect information. Asymmetric information leads to a market failure if demand and supply are interdependent rather than independent.

In healthcare, a market failure stems from asymmetric information in situations where consumers do not have the expertise to independently determine their own demand for healthcare services or monitor the quality of the services provided. Consumers may lack sufficient knowledge to diagnose their illness, evaluate the different courses of treatment, and select the optimal treatment. Hence, the provider influences the consumer's demand thereby creating interdependence between demand and supply.

In addition, consumers have less information about the quality of their healthcare providers

than the providers have about their own quality. For primary care and other frequently purchased services (e.g., care for chronic conditions), consumers have the opportunity to learn about the quality of the provider over time, through experience or trial and error. For services that individuals make use of infrequently or only need once (e.g., a kidney transplant), asymmetric information is a more important issue. The consumer cannot learn about the quality of a provider through experience and, therefore, is unable to monitor the quality of the care delivered.

Because of specialized medical training, a provider usually has more information than the patient about his or her diagnosis and the necessary treatment. The provider acts as an agent of the patient, thereby diagnosing the patient's illness, recommending a treatment, and often, providing the recommended treatment. Through this principal-agent relationship, the patient delegates some decision-making power to the provider, thereby allowing the provider to influence his or her demand. Even if a provider shares with the patient all available information about his or her illness, treatment options, and expected outcomes, it may still be difficult or even impossible for the individual consumer to make the optimal decision without the provider's recommendation, given the complexity and quantity of medical information that must be assimilated for complicated health problems.

Externalities

An externality exists when the decision of a consumer or producer incurs costs or benefits for other consumers or producers. An externality is negative when an individual's or a firm's decision creates a cost for others; it is positive when an individual's or a firm's decision creates a benefit for others. An externality results in a market failure because the market price fails to take into account the social costs and benefits that are realized by individuals or firms other than the consumer or producer.

Externalities in healthcare may affect production or consumption. An example of a *positive consumption externality* is obtaining a flu vaccination. By obtaining a flu shot, an individual directly benefits by protecting himself or herself from contracting the flu. And other members of

society benefit from the individual who obtained the flu shot, as well, because it reduces their risk of contracting the flu. An individual's decision on whether to obtain a flu shot is based on his or her marginal cost compared with his or her marginal benefit from receiving the vaccination. The individual does not consider the downstream consequences of his or her decision (i.e., whether the risk to others of contracting the flu is reduced by him or her receiving a flu shot). When individuals bear the full cost of a decision in the presence of a positive consumption externality, too few goods or services will be purchased in the market—that is, too few people will purchase a flu shot—even though other members of society also benefit from the decision. A classic example of a *negative consumption externality* is smoking: An individual's decision to smoke in a public place has a negative impact on others through secondhand smoke.

On the production side, research is a common *positive production externality*. An individual or firm producing scientific research affects the welfare of others in society by creating knowledge that could benefit the broader community. When the full costs of research are wholly borne by the individual scientist or institution, however, too little research will be undertaken. An example of a *negative production externality* is a hospital that incinerates used surgical supplies containing PVC, which turns into the toxic chemical dioxin when burned. The firm passes a social cost onto other individuals by increasing their risk of cancer, but this cost is not borne by the firm itself.

Solutions

The government may intervene in situations where the market cannot achieve an efficient allocation on its own. The government has several mechanisms by which to intervene and improve the market. However, government involvement is not necessarily the optimal action; many believe that it should only step in if the marginal benefits from the intervention exceed the marginal costs of the intervention, after factoring in spillover effects on other markets and individuals. In addition, as technology and other innovations evolve over time, new markets may develop to facilitate more efficient allocations.

Health Insurance

Health insurance is a mechanism that mitigates market failure associated with uncertainty. Health insurance protects an individual against financial losses associated with healthcare costs due to an illness or injury that cannot be predicted either in terms of occurrence or magnitude. For groups in which private coverage is not accessible, the government may function as the insurance provider. Public insurance programs, such as Medicare and Medicaid, ensure that the highest-risk individuals who do not have access to employer-provided health insurance offerings can obtain insurance coverage. At the same time, health insurance also introduces additional market problems, including *moral hazard* and *adverse selection*.

Taxes

To solve the problems of externalities—where the marginal private benefits do not equal the marginal social benefits or where the marginal private costs do not equal the marginal social costs—taxes and subsidies (i.e., negative taxes) can be used. Taxes are used when the marginal private costs are less than the marginal social costs, and subsidies are used when the marginal private benefits are less than the marginal social benefits.

Taxes alter the economic incentives of the buyer and seller: Taxes make it more costly to produce the externality, causing the quantity of the externality to decrease. The tax should equal the additional cost levied on the parties harmed by the externality, and the funds raised should be used to compensate those individuals. Although taxes force the creator of the externality to internalize the costs of their actions, taxes are not a perfect solution for several reasons. First, they allow the externality to continue; hence, individuals will still be harmed by the externality but will theoretically be compensated for their loss. Second, it is difficult to assess the actual cost of the externality that is imposed on others, so the tax is only an approximation of the real cost. Third, taxes generate monitoring costs to ensure that the parties creating the externality pay the tax.

Regulation

Direct government involvement is another solution to many market failures. With no regulation, pharmaceutical companies might invest less in research and development—and ultimately develop fewer new drugs that society would benefit from—because other companies could act as free riders and replicate the inventor's products without incurring the research and development costs required to bring a new product to market. Patent protections, therefore, encourage pharmaceutical companies to invest more in research and development by providing a protected period of time when the developing company will be the sole provider of its drug.

Regulation also more clearly defines and enforces property rights when they are ambiguous in the market. By assigning property rights, regulations determine whether one party has the right to produce an externality or another party has the right to not consume the externality. Smoking bans in public places—restaurants or bars, for example—implicitly assign the right to clean air to the non-smoker and remove the right to smoke in these places, thereby prohibiting smokers from passing along secondhand smoke to others. As with taxes, it is important to assess the marginal costs and benefits of regulations. Smoking bans decrease the likelihood of illnesses such as lung cancer but may impose a cost on other parties (e.g., restaurants and bars) if the net effect is fewer patrons, smaller tabs per patron, or both.

Antitrust policies prevent the existence of monopolies, the most extreme type of market power. If a monopoly or oligopoly is beneficial to a market because of economies of scale, however, the government may allow its formation but may regulate prices.

Licensing of health professionals and healthcare organizations is a regulatory strategy to mitigate a market failure related to the lack of information on the quality of providers. Licensing and certification ensures a minimum quality level but restricts the quantity of providers and limits competition from other types of providers through restrictions on the scope of practice.

The Availability of Information

New technology and other innovations can improve the availability of information. New diagnostic

technologies can improve the certainty of a diagnosis, and the Internet has created a venue for consumers to freely access information on healthcare providers. For example, the Centers for Medicare and Medicaid Services (CMS) now publish information on the Internet on hospital processes of care, outcomes of care, and patient satisfaction to allow consumers to compare the quality of care provided across the nation's hospitals.

New technological advances such as those made through the widespread adoption of the Internet will continue to improve the availability of information, which may be the most consequential change. Yet, distilling the vast amount of medical information available on the Internet, selecting the most valid and credible information, then assimilating it to a level that is useful to the individual consumer is no small feat. An Internet search through Google on diabetes treatment or diabetes care, for example, turned up 2.5 million results.

Although the Internet has armed consumers with more information to help diagnose their illnesses, determine alternative courses of treatment, judge the potential health outcomes, and judge provider quality, healthcare providers nevertheless remain the experts in delivering healthcare. Comparative information on healthcare quality—about which providers give the best care and have the best risk- and severity-adjusted outcomes—remains limited. Although several Web sites provide comparative information on some hospital-based healthcare outcomes, most quality comparisons continue to rely on either intermediate outcomes or proxies of quality—such as the occurrence of malpractice judgments, patient satisfaction data, and process outcomes—rather than health and healthcare outcomes. Further work is needed to determine how to accurately measure and compare health and healthcare outcomes across the continuum of providers (e.g., hospitals, physicians, nursing homes) and report the findings in a manner that is both easily accessible and comprehensible to consumers.

Two external forces may also increase information transparency. First, a shift to high-deductible health insurance plans increases the need for consumer-targeted information in the public domain on both quality and prices so that consumers can assess both the quality and out-of-pocket costs of alternative treatments. Second, medical travel—travel for

medical care outside one's home country—may also increase the availability and comparability of information on quality and prices for some services. Non-U.S. healthcare providers catering to international patients, including U.S. patients, now publish on the Internet inclusive prices for the common surgical procedures provided at their facilities. (In the United States, although prices have been relatively transparent for a small set of elective procedures traditionally not covered by health insurance [e.g., Botox and LASIK surgery], it has generally been very difficult if not impossible to obtain, in advance, the price that an uninsured individual will pay out of pocket for a surgical procedure or hospitalization.) These two forces may ultimately drive providers to disseminate information on prices and quality and, ultimately, compel the government to facilitate the collection and dissemination of comparative information.

Tricia J. Johnson

See also Adverse Selection; Economic Spillover; Healthcare Markets; Health Economics; Health Insurance; Moral Hazard; Regulation; Supplier-Induced Demand

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- American Society of Health Economists (ASHE): <http://healthconomics.us>
- International Health Economics Association (iHEA): <http://www.healthconomics.org>
- National Bureau of Economic Research (NBER): <http://www.nber.org>
- World Health Organization (WHO): <http://www.who.int>

MARMOR, THEODORE R.

Theodore (Ted) R. Marmor is Professor Emeritus of Public Policy and Political Science at Yale University, where he taught from 1979 to 2007. Currently he is an adjunct professor of public policy at the John F. Kennedy School of Government at Harvard University. His specialization is the contemporary welfare state in North America and Europe, with particular expertise on healthcare policy. His research on healthcare has yielded a national and international reputation as the most recognized academician in healthcare policy and politics. Marmor's first book, *The Politics of Medicare* (1970), is a classic in the field. The second edition of *The Politics of Medicare* (2000) traces developments in healthcare policy since the enactment of Medicare in 1965. In the decades since Medicare was enacted, Marmor has been a prominent analyst of health policy and advocate of universal healthcare.

Born in New York City on February 24, 1939, he received his bachelor's degree from Harvard University in 1960; attended Wadham College, Oxford from 1961 to 1962; and then returned to Harvard, earning his doctoral degree in 1966. Marmor began his academic career as an assistant

professor of political science and was promoted to associate professor at the University of Wisconsin during 1967 to 1970, then joined the faculty at the University of Minnesota (1970–1973) and later the University of Chicago (1973–1979) before going to Yale University in 1979.

In 1966, Marmor was special assistant to Wilbur Cohen, the Secretary of Health, Education, and Welfare; he served as associate dean at the School of Public Affairs during his tenure at the University of Minnesota; and at Yale University, he chaired the board of its Center for Health Services. He was a member of President Carter's Commission on the National Agenda for the 1980s and a senior policy advisor to Democratic presidential candidate Walter Mondale during the 1984 election campaign. Marmor has testified before congressional committees about healthcare reform, social security, and welfare policy in addition to acting as an expert witness in health-related judicial proceedings, including the constitutionality of the Canada Health Act, disputes over Medicare, and U.S. asbestos litigation.

Marmor serves on the editorial boards of the *Journal of Comparative Policy Analysis: Research and Practice*; the *Journal of Health Services Research and Policy*; the *International Journal of Health Planning and Management*; and the *Journal of Health Politics, Policy, and Law*. He was a centennial visiting professor at the London School of Economics (2000–2003) and has been a fellow or visiting fellow with the Australian National University, the Canadian Institute for Advanced Research, All Souls College at Oxford University, and the Netherlands Institute for Advanced Study. During 1993 to 2003, he was director of the Robert Wood Johnson Foundation Post-doctoral Program (Medical Care and Social Sciences).

Marmor has authored or coauthored 13 books, nearly 200 scholarly articles and book chapters, and more than 100 op-ed pieces in magazines and newspapers here and abroad. His scholarship has appeared in many prestigious journals, including the *American Political Science Review*, the *Michigan Law Review*, the *American Journal of Obstetrics and Gynecology*, the *New England Journal of Medicine*, the *Journal of Health Politics, Policy, and Law*, and the *Canadian Medical Association Journal*.

Raymond Tatalovich

See also Cohen, Wilbur J.; Equity, Efficiency, and Effectiveness in Healthcare; Healthcare Reform; Medicaid; Medicare; Public Health Policy Advocacy; Public Policy; Regulation

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MATHEMATICA POLICY RESEARCH (MPR)

Mathematica Policy Research, Inc. (MPR), established in 1968 as a division of Mathematica, Inc., is a policy research organization that specializes in data collection and evaluation and policy analysis. The company provides research expertise, survey design and implementation techniques, information technology, and policy assessments to a wide variety of clients, including government agencies, universities, and foundations. For the past 40 years, MPR has helped to inform, shape, and enrich public policy.

Organizational Structure

MPR was incorporated under its current name in 1975, and it became an employee-owned entity in 1986. Headquartered in Princeton, New Jersey, the organization also has offices in Washington, D.C.; Cambridge, Massachusetts; and Ann Arbor, Michigan. The organization has partnered with the Robert Wood Johnson Foundation (RWJF) to establish the Center for Studying Health System Change (HSC), which is a wholly owned subsidiary of Mathematica, Inc. The HSC and MPR

share administrative resources and collaborate on key studies and research projects.

Two major divisions of MPR are the surveys and information services division and the research division. The surveys and information services division gives clients the tools, technology, and customized surveys that help them gather appropriate and meaningful facts and figures. The research division builds on these efforts, providing findings and scientific evidence that policymakers can use in their decision making.

In the surveys and information services division, staff members help clients (a) identify the best data collection methods, (b) design custom survey instruments for small and large samples, (c) recognize the special needs of data collection in diverse populations, (d) conduct statistical analysis and modeling, and (e) use advanced technology for surveying and data management. MPR takes into account factors that may cause bias and skew survey results such as language barriers and subject disabilities. The organization also employs Internet technology and Web-based techniques to enhance its surveys.

The research division conducts research for the public and private sectors, strengthening an evidence-based approach to shaping policy agendas. The division is responsible for (a) developing experiments and demonstrations; (b) quantitatively evaluating programs by looking at economic and statistical analyses of their effects, benefits and costs, quality, and value of output; and (c) qualitatively evaluating implementation and operations, using process and case study analyses. Researchers also predict the effects of proposed changes through the use of microsimulation and provide ongoing support to bolster research infrastructure. Through the expertise of systems analysts, social psychologists, economists, sociologists, demographers, and education specialists, the division is focused on conducting policy analyses to better understand the implications of policy choices in key research areas. The organization strives to communicate and disseminate its findings to policymakers and the general public.

Main Research Areas

MPR has conducted studies on programs and policy in the following areas: education, labor, welfare, nutrition, disability, early childhood, and

healthcare. The organization focuses on these areas because they remain central to local, state, and federal policy.

Education

MPR provides research and evaluation of education efforts ranging from early-childhood schooling, to kindergarten through 12th grade, and beyond. It examines elementary reading and mathematics curricula, teacher quality, interventions for at-risk youth, after-school initiatives, college access and preparation, charter schools, school choice programs, education technology, school and student performance competencies, and career-focused education. The organization is also committed to improving education research overall by strengthening research methods and reviews. The organization administers the What Works Clearinghouse, a tool established by the U.S. Department of Education's Institute of Education Services that collects, reviews, and reports on studies of education programs, practices, and products. It is also involved with the evaluations of the Teach for America, No Child Left Behind, Head Start, and Upward Bound programs.

Labor

By examining the factors that affect the workforce, MPR helps to inform career training and placement interventions as well as employment policies. The organization focuses on research aimed at expanding opportunities for at-risk youth, disadvantaged adults, young people living in poverty, experienced workers who have lost their jobs, people who are involved in criminal activity and the criminal justice system, and others who face barriers to entering the workforce.

Welfare

MPR is involved in many projects that evaluate welfare reform efforts at the state and national levels. For example, it has examined initiatives—designed to help Technical Assistance for Needy Families (TANF) recipients—that look at interventions aimed at strengthening families, father involvement and support, healthy relationships, and abstinence education for teens. The organization

evaluates welfare-to-work initiatives, efforts to increase job opportunities, long-term dependency on multiple public aid programs, and cost projections for federal and state programs. These research efforts help educate policymakers and program administrators seeking to improve the systems.

Nutrition

The organization's researchers study nutrition issues such as access to food, public food and nutrition assistance programs, emergency food assistance networks, and growing trends in obesity. For more than 30 years, the organization has extensively examined the Food Stamp Program and the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), helping policymakers assess reform efforts and continue to make revisions. In addition, its researchers have studied school nutrition programs, including school lunch and breakfast programs, as well as initiatives to improve children's diets and eating habits. With its findings, MPR informs ongoing efforts to improve the dietary status of all Americans.

Disability

For people living with disabilities and chronic diseases, advances in medicine and technology lead to more opportunities and increased independence; such changes may have important public policy implications at the state and national levels. The organization conducts research on programs such as Social Security and Medicaid, and it also gathers data on children with disabilities and their families. In addition, the organization looks at job programs for disabled adults. Mathematica's Center for Studying Disability Policy (CSDP) works with disability organizations and advocacy groups to enhance policy changes; it focuses on assessing service delivery, financing, resources, and disincentives. These efforts help leaders develop public policy to meet the changing needs of this special population.

Early Childhood

MPR studies and evaluates interventions aimed at improving the well-being of young children. These programs include (a) Head Start, (b) the Family and Child Experiences Survey (FACES),

(c) affordable day-care programs, (d) preschool curricula, and (e) initiatives serving low-income families.

Healthcare

In addition to its work relating to chronic disease and disability, MPR conducts a wide range of studies on health and the healthcare system. Researchers analyze costs, financing, insurance mechanisms, and coverage. MPR has also explored the effectiveness and quality of public- and private-sector services and the delivery of care. Specific projects include assessing the success of Medicaid, the State Children's Health Insurance Program (SCHIP), and private coverage options at increasing access to care for low-income families. The organization's work is also concerned with public health initiatives such as chronic-disease management programs and infectious-disease control measures. It evaluates programs that are designed to address mental health parity and health systems quality, and it also examines the role of advanced technology in improving health outcomes. Last, it provides leadership and policy advocates with the tools to promote sound and informed policy agendas.

Future Implications

MPR continues to provide policymakers and the general public with key information. Over the past few years, it has worked increasingly with international clients and begun addressing issues at a global level. Moving forward, the organization will ensure quality data collection, evaluation, and analysis for the United States and beyond.

Kathryn Langle

See also Center for Studying Health System Change; Health Insurance; Health Surveys; Medicaid; Medicare; Public Health; Public Policy

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<http://www.hschange.com>
- Mathematica Policy Research (MPR):
<http://www.mathematica-mpr.com>

MAYNARD, ALAN

Alan Maynard is a well-known, highly respected health economist in the United Kingdom. Maynard has been instrumental in initiating policies for the UK National Health Service (NHS). Specifically, he proposed the establishment of the General Practitioner Fund Holding, from which physicians are given budgets to fund their activities as well as secondary care for their patients. He also proposed that the NHS only pay for pharmaceutical drugs that their manufacturers could demonstrate to be cost-effective and efficient. This proposal ultimately led to the formation of the National Institute of Clinical Excellence (NICE).

Maynard is a professor of health economics and the director of the York Health Policy Group in the Department of Health Sciences at the University of York. He is also an adjunct professor at the University of Technology in Sydney, Australia.

Maynard was educated at the University of Newcastle-upon-Tyne, earning first-class honors in economics in 1967. He received a bachelor's degree from the University of York in 1968. He did his postgraduate work at the University of York; while there, he was introduced to the field of public expenditure, which ignited his interest in healthcare. He taught economics as an assistant lecturer and then lecturer at the University of Exeter from 1968 to 1971. From there, he returned to the University of York as a lecturer in economics. In 1977, he became senior lecturer at York,

where he founded the Graduate Program in Health Economics, serving as its director until 1983. In 1983, he became a professor of economics and the founding director of the Centre for Health Economics at York. From 1995 to 1996, he served as the secretary and chief executive of the Nuffield Provincial Hospitals Trust, a foundation that funds research in health policy. In 1996, he returned to the University of York as a professor of health economics and the director of the York Health Policy Group.

Maynard was made an honorary member of the Faculty of Public Health Medicine of the Royal Colleges of Physicians in 1993. He was elected president of the International Health Economic Association (iHEA) in 1999. He was named a fellow at the Academy of Medical Sciences for the United Kingdom in 2000. In 2002, he was named adjunct professor at the Centre for Health Economics in Research and Evaluation at the University of Technology in Sydney, Australia. He has been awarded honorary doctorate degrees from the Universities of Aberdeen (2003) and Northumbria (2006).

He is the founding editor of *Health Economics* and has written more than 250 scholarly articles and 10 books. He also is a member of the editorial boards of the *British Journal of Obstetrics and Gynaecology*, *Pharmacoeconomics*, *Health Manpower Management*, and the *Drug and Alcohol Review*.

In addition to Maynard's academic experience, he has served the NHS as a member of the York Health Authority (1983–1991), nonexecutive director of the York National Health Service Hospital (1991–1997), and has been the chair of the hospital since 1997.

Maynard has provided consultant services for the UK Department for International Development, the World Health Organization (WHO), and the World Bank on healthcare issues in Cyprus, Greece, Thailand, Brazil, Mexico, China, Botswana, South Africa, Bolivia, Chile, Lithuania, Latvia, Hungary, Russia, Malawi, Serbia, Kyrgyzstan, and Ukraine.

Currently, Maynard is working on improving the performance of health technology assessment and workforce productivity. In the next 10 years, he hopes to see proper routine measurement and management of patient-reported outcome measures.

Amie Lulinski Norris

See also Health Economics; International Health Economics Association (iHEA); Pharmacoeconomics; United Kingdom's National Health Service (NHS); United Kingdom's National Institute for Health and Clinical Excellence (NICE)

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University of York, Department of Health Sciences:
<http://www.york.ac.uk/healthsciences/gsp/staff/amaynd.htm>

MCNERNEY, WALTER J.

In his 45-year career, Walter J. McNerney (1925–2005) had a profound impact on the nation's healthcare system. McNerney played a pivotal role in the creation of the federal Medicare program, he was a leading educator in hospital administration, and he was the president of the national Blue Cross and Blue Shield Association.

Born in 1925 in New Haven, Connecticut, McNerney earned a bachelor's degree in industrial administration from Yale University in 1947. After graduation, he taught advanced mathematics at the Hopkins School, a private college-preparatory school in New Haven. He left New Haven to attend the University of Minnesota, where he earned a master's degree in hospital administration in 1950. Over the next several years, he held various administrative

positions in hospitals in Providence, Rhode Island, and Pittsburgh, Pennsylvania.

McNerney joined the faculty of the University of Michigan in 1955, where he founded and headed the university's hospital administration program in the School of Business. While at the university, he developed the program's curriculum, taught hundreds of students, and conducted one of the largest, most comprehensive research projects ever undertaken in healthcare. The landmark project detailed the availability, use, quality, finance, and politics of healthcare across the state of Michigan. The results of the project were published in *Hospital and Medical Economics*, a massive two-volume set.

In 1961, McNerney left the University of Michigan to become the president of the national Blue Cross Association. As president, he oversaw the merger with the Blue Shield Association and the subsequent creation of the national Blue Cross and Blue Shield Association. McNerney was instrumental in getting the independent Blue Cross and Blue Shield plans to offer health maintenance organizations (HMOs) and managed-care plans, because he thought that the implementation of managed care was inevitable.

In 1963, he founded the journal *Inquiry*. Today, *Inquiry* is one of the top three peer-reviewed scholarly publications in the field of health services research.

McNerney was a leading advisor to President Lyndon B. Johnson. In partnership with the administration's Wilbur J. Cohen, he developed the blueprint for the Medicare program that, together with Medicaid, was signed into law in 1965. Under President Richard M. Nixon, McNerney also served as chairman of the task force on Medicaid. The panel's final report called for an overhaul of the federal-state apportionment of costs and responsibilities, issues that remain contentious to this day.

After retiring from the Blue Cross and Blue Shield Association in 1981, McNerney went back to academe, becoming the Herman Smith Professor of Health Policy at the Kellogg School of Business at Northwestern University. While teaching at the university, he continued to consult with numerous organizations. He retired in 1998 after suffering a stroke. In 2005, McNerney died at his Winnetka, Illinois home, at the age of 80.

During his long and illustrious career at the University of Michigan, the Blue Cross and Blue Shield Association, and Northwestern University, McNerney mentored hundreds of students as well as junior and senior managers. He served on numerous government and private-sector committees and advisory bodies. He frequently testified before various congressional committees. He worked tirelessly with community organizations and charitable foundations. He wrote 3 books and more than 75 articles on various aspects of health-care. His areas of expertise included healthcare insurance, management, financing, education, leadership, philanthropy, strategy, and policy. Because of his large number of areas of expertise and wide general knowledge, many considered McNerney a 20th-century Renaissance man.

Tara Moore

See also Association of University Programs in Health Administration (AUPHA); Blue Cross and Blue Shield; Cohen, Wilbur J.; Health Insurance; Medicaid; Medicare; Public Policy

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MEASUREMENT IN HEALTH SERVICES RESEARCH

Measurement in health services research often involves assessing a person's well-being through self-report instruments. Whereas the presence of disease and its effects on mortality can be directly ascertained through clinical observation, the assessment of well-being requires the development of self-report instruments. The measurement of well-being and other internal states (e.g., depression) involves an individual's responses to items that represent various manifestations (e.g., symptoms, attitudes, and beliefs) that collectively reflect the main features of the constructs. The use of measurement in health services research has grown since the 1960s due to policy initiatives such as President Lyndon B. Johnson's "War on Poverty" that necessitated self-report measures to guide program planning and monitor program effectiveness. With support from the National Center for Health Services Research (NCHSR), development and use of multi-item scales has increased dramatically across the spectrum of health services. As a result of contributions from many different disciplines, an array of measures of health status and health outcomes have been developed to evaluate whether healthcare is achieving its mission of reducing disease, disability, and pain and improving health-related quality of life.

Overview

For health service measures to achieve their intended purpose, they must be developed on the basis of a sound theoretical framework and a thorough understanding of the constructs being measured, and rigorous procedures must be used during instrument validation. Sophisticated statistical procedures for data analysis cannot compensate for measures that lack sufficient reliability, validity, and sensitivity. For the responses to individual items or questions to translate into

meaningful measures, consideration should be given not only to the underlying theory and the empirical evidence but also to the measurement model being used. Presently, the most common approach in health services research for obtaining meaningful scores on measurement instruments is the *classical test theory* (CTT) approach in which raw item scores are mathematically manipulated, usually by summing across the item scores to obtain a total score. Similarly, the prevalent *instrument validation strategies* are derived from the CTT procedures for instrument development. However, there are alternative measurement models, including the Rasch model and item response theory (IRT), that provide viable alternatives to CTT and are starting to gain acceptance in health services research.

Classical Test Theory

For more than 80 years, CTT has been the basis for the development and evaluation of health services instruments. Under this framework, no distributional assumptions about scores are made. Like modern test theories, CTT does make the assumption that the trait being measured is unidimensional. Perhaps due to its simplicity and relatively weak assumptions, CTT continues to be the prevalent measurement model in health services research. Whereas CTT has played an important role in measuring the diverse panoply of health conditions, the major limitations associated with it have been well-documented in the psychometric literature: (a) sample dependence, (b) test dependence, (c) all items are not created equal, (d) scores are nonlinear and noninterval, and (e) lack of efficiency.

Sample Dependence

Under CTT, item parameters (e.g., item difficulty and other item statistics) are sample dependent. This means that items may have greater difficulty estimates or reflect high severity when they are administered to respondents at the low end of the score continuum but have smaller difficulty estimates or reflect less severity with respondents at the high end of the score continuum. That item statistics depend on the sample with which they are estimated means that these statistics have limited value, except when the sample is similar to

the ultimate patient population for which future instruments will be constructed. Unfortunately, such similarity is rare because instrument validation studies most often rely on samples of convenience, and over time, a population's level of the construct being measured may change.

Test Dependence

The test score, which is often used as a descriptor of a respondent on a given construct, is test dependent. If the level of "difficulty" of the items in the test instrument is changed, as might be done in the context of computer-adaptive tests, then the test scores are no longer on the same mathematical metric. Therefore, they are not a useful variable for comparing respondents to each other or to performance standards.

All Items Are Not Created Equal

The creation of raw scores by summing item responses assumes that the items are equivalent with respect to their position on the construct. In general, this is not a valid assumption.

Scores Are Nonlinear and Noninterval

Ideally, measures derived from health services instruments should be linearly related to the construct being measured. Furthermore, the magnitude of change represented by a single unit on the measurement continuum should remain constant across the measurement spectrum. Regardless of a score's range or whether it is converted to a standard metric, raw scores do not possess the property of linear interval measurement. Noninterval measurement can have serious implications regarding the sensitivity of CTT-based instruments. Research comparing CTT-based scores to Rasch-based measures indicates that the raw scores tend to overestimate trait levels at the low end of the measurement spectrum and underestimate trait levels at the high end.

Lack of Efficiency

In the 1980s, with healthcare practitioners and researchers demanding more measures, the need arose for greater efficiency without a loss of reliability and validity. The CTT model is less than

ideal for efficiency because it achieves greater test reliability by increasing the number of items.

Rasch and IRT Measurement Models

Although the early work in IRT took place at the same time as that of the Rasch model, the Danish mathematician and statistician Georg Rasch (1901–1980) was the first to formalize his measurement model. Common to the Rasch and other IRT models is the idea that underlying a respondent's performance on a set of items, questions, performance tasks, or even rating scales is a set of human characteristics known as *latent traits*. These traits, broadly or narrowly defined, are not directly observable. Instead, they must be inferred from an individual's responses to the items or questions comprising the measurement instrument. The IRT measurement model provides an estimate of a given trait by specifying a probabilistic relationship between the items and their characteristics and the estimated trial level. In the Rasch model, this probabilistic relationship is stated most simply for dichotomous items.

There are three features of the Rasch model that are of particular note. First, the use of a probabilistic model allows instrument developers to compare the actual and expected response patterns for a set of items, thereby providing a mechanism for assessing the *model fit*. If the responses are generally consistent with the *model expectations*, the measure is judged to fit the Rasch model and, therefore, has the desired properties of conjoint additivity and sample-free and test-free measurement. Second, the direct comparison between *person measures* and item parameters is possible because both are measured on the same scale: the logit or “log odds ratio” scale. The ability to distinguish person measures and item parameters has important implications with respect to the assessment of change and the evaluation of an instrument's generalizability across cultures. Third, the use of logarithms permits the “bent ruler” of raw scores to have linear and equal-interval properties. Logarithms are useful in transforming curvilinear functions into linear relationships. In the 19th century, the German experimental psychologist Gustav Fechner (1801–1887) was the first to realize that the relationship between stimuli and responses when measuring human characteristics is not linear

but rather logarithmic. This suggests that the logarithmic scale both has desirable measurement properties and is well suited for measuring many human characteristics.

Multiparameter IRT Models

Other IRT models include additional item parameters. Whereas the Rasch model makes the assumption that discrimination is equal for all items, multiparameter models typically estimate an *item discrimination parameter*. In educational testing, a *guessing parameter* also may be included. Whereas its *difficulty* refers to the location of the item on the measurement continuum, its *discrimination* refers to the steepness or the slope of the item's characteristic curve (ICC). Items with steep ICCs indicate that a unit change in a person's measure corresponds to a large change in the probability of endorsing the item. Conversely, low discrimination indicates that a unit change on the measure corresponds to a relatively small change in the probability of item endorsement. The guessing parameter is quantified as the probability of item endorsement at the lower asymptote of the ICC.

Research has demonstrated that the Rasch model has properties, associated with additive conjoint measurement, that are required by parametric statistics and advantageous for accurate assessment of change over time. If the data fit the model reasonably well, the Rasch model—compared with CTT and other IRT models—makes the clearest justification that interval- and even ratio-level measurement is obtainable with the survey instruments.

Application of Rasch Measurement

Although Rasch and IRT have their roots in educational testing, these measurement models have been adapted for use in health services research. Some of the earliest health-related applications of Rasch and IRT were in the field of rehabilitation. The initial efforts generally involved the use of the Rasch model. This may be due, in part, to the fact that the Rasch model has lower sample size requirements, compared with multiparameter models, to obtain stable item parameters and accurate person measures. This makes it more suitable for the measurement of highly select

populations such as persons with specific types of physical impairments.

Rehabilitation emphasizes monitoring and assessing a person's abilities with respect to physical functioning and the performance of the activities of daily living (ADL). Rehabilitation researchers quickly recognized the limitations in raw scores and the potential of Rasch measurement to produce precise, equal-interval measures. The use of the Rasch model to provide unambiguous measures of the change resulting from rehabilitation made it an attractive alternative to the estimation of change using raw scores, which has long been known to have serious problems. The application of modern measurement models quickly spread to other areas of health research, including health services research.

Measurement of Change

In health services research, the analysis of change is a difficult issue, which may be complicated or confounded by the properties of the measurement instruments. Because of its linear, interval-scaling properties, Rasch measurement enables the assessment and adjustment of measures over time—when the meanings of items may have changed due to differing interpretations of the items and differing use of the rating scale from time one to time two. For the research purpose of interpreting the outcomes, the development of linear, interval, clinical measures makes it possible to move past the reliance on statistical significance, with numbers that are difficult to interpret clinically, to the assessments of outcomes that have clear clinical criteria. Having clinical milestones on the ruler enables the use of much simpler and more easily interpretable numbers that tell the practitioner and researcher (a) how many patients got better in each group, (b) how many patients are borderline and require careful watching, and (c) how many patients are still severe and require a stronger or a different intervention.

Assessing the Cross-Cultural Stability of Item Parameters

To assess individual change, it is important to establish the stability of item parameters over time. It is also critical to determine if measures are

equivalent between culturally defined groups. Measurement equivalence is necessary to make accurate quantitative comparisons across culturally or linguistically defined groups. During the past decade, numerous journal articles have been published concerning the cross-cultural and linguistic equivalence of health and health outcome measures using modern measurement methods. The ability of the Rasch and other IRT measurement models to separate person measures and item parameters and the use of differential item functioning (DIF) analysis have undoubtedly contributed to the growth of this area. Compared with test developers in the fields of education and psychology, health outcome researchers have been slow to acknowledge the presence of DIF in their instruments. However, the incorporation of Rasch and IRT methods in health services research in recent years has led investigators to examine DIF on several measures across a variety of culturally and linguistically defined groups. DIF by country or language has been identified on measures of functional status, disease activity, pain, substance abuse, and health-related quality of life. The presence of DIF does not necessarily indicate that the item(s) producing DIF are biased. DIF may reveal the presence of real group differences. For instance, males and females frequently differ in their presentation of depressive symptoms; likewise, adolescents and adults may differ in their patterns of substance use and symptoms of substance dependence and abuse.

Whereas the Rasch and IRT models provide a mechanism for detecting and adjusting for DIF, it is also important to generate theories and hypotheses that explain the causes of DIF. Rather than simply purging items that fail to fit the measurement model or controlling for DIF through the use of anchoring and equating procedures, understanding the causes of these problems can add greatly to the researchers' ability to write better items. It is also important to note that although DIF is extremely useful in detecting *item bias*, *measures* may be biased or nonequivalent in other ways. For instance, a construct can be defined differently across different cultures (*construct bias*), and there may also be differences in the sample characteristics and administration procedures (*method bias*). Thus, whereas DIF represents an important tool in establishing cross-cultural equivalence, it must be

integrated into a larger process of establishing cross-cultural validity.

Computerized Adaptive Testing

Healthcare providers are under increasing pressure from consumers as well as public and private funders to demonstrate that they can provide evidence-based interventions that achieve reliable outcomes. To make matters more complicated, public and private funders have been demanding more detailed assessment (e.g., to diagnostic criteria or a standard for a given area) or other evidence of the standardization of care. Of course, they are also concerned about how the scores translate into diagnosis, placement, and treatment-planning recommendations, particularly for specialty and costly services. Although these efforts hold promise, they also have associated costs: Longer assessments may lead to patient fatigue or agitation; the staff time to learn, administer, interpret, and report on the standardized assessment consumes resources and is costly for the treatment agencies.

Computerized adaptive testing (CAT), coupled with modern psychometric methods and *item banking*, represents a promising solution to the measurement problems encountered with the traditional fixed-form instruments. The combined use of CAT, Rasch, and IRT measurement models plus item banking provides comprehensive and precise measurement with a limited burden to respondents.

CAT algorithms are designed to select and administer a subset of items in a process likened to a binary search. The selected items are tailored to the person's level on the measured construct, and the unnecessary items are eliminated from the assessment process with a minimal loss of measurement precision. This results in a reduced respondent burden and enhanced content specificity. Conversely, item banking increases the content coverage and minimizes the presence of measurement floor and ceiling effects. In addition, CAT is more practical and reliable over a wide range of score levels. Evidence of the efficacy of CAT has revealed several practical advantages, including (a) substantial reductions (50–90%) in the respondent burden, (b) the virtual elimination of ceiling and floor effects, and (c) gains in precision. Though CAT offers significant benefits, the development of

a working CAT requires considerable time and resources, particularly with respect to item bank development and maintenance. A well-developed CAT, however, if it gains widespread acceptance in the field, has the potential to replace the plethora of instruments that now exist for the measurement of health constructs. A CAT item bank can contain enough items to exhaustively represent the construct of interest and produce scores on a single standardized ruler.

Future Implications

The tools for achieving high-quality, valid, and precise measurement in health services research are now readily available. The use of Rasch models is increasing, and they can be applied to a wide range of new applications. These measurement models will likely continue to be adopted toward the ultimate goal of improving each individual's health and well-being.

*Barth B. Riley, Kendon J. Conrad,
and Karon Cook*

See also Disease; General Health Questionnaire; Health; Health Surveys; Quality of Well-Being Scale; Satisfaction Surveys; Short-Form Health Surveys (SF-36, -12, -8); Ware, John E.

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Council of American Survey Research Organizations

(CASRO): <http://www.casro.org>

Institute for Objective Measurement (IOM):

<http://www.rasch.org>

MECHANIC, DAVID

David Mechanic is the René Dubos Professor of Behavioral Sciences and the director of the Institute for Health, Health Care Policy, and Aging Research (IHHCPAR) at Rutgers University. He is a pre-eminent medical sociologist whose research and writing deal with the social aspects of health and healthcare.

Mechanic earned his bachelor's degree from the City College of New York (1956) and his master's (1957) and doctorate (1959) degrees in sociology from Stanford University. In 1960, he joined the faculty of the University of Wisconsin–Madison where he was the chair of the Department of Sociology (1973–1979) and the director of the Center for Medical Sociology and Health Services Research (1972–1979). In 1979, he moved to Rutgers University where he was dean of the Faculty of Arts and Sciences (1980–1984) and, in 1985, became the founding director of IHHCPAR, which he continues to direct. Mechanic also serves as the director of the Robert Wood Johnson Foundation's Investigator Awards in Health Policy Research Program.

Mechanic has been an extraordinary and pioneering leader in the social and behavioral sciences of health, health services, and health and mental health policy over the past 40 years. His work has been innovative in a number of research areas. Mechanic developed the field of illness behavior—that is, the study of how people

perceive, evaluate, and selectively act in response to symptoms. His conceptualization of the appraisal and meaning processes that accompany illness as affected by socialization and situational cues has influenced generations of work on the use of health services.

One of Mechanic's distinctive qualities has been his vision in identifying trends and defining new research areas and perspectives in healthcare policy. In his classic study on the social adaptation to stress, he developed an alternative theory to the then pervasive psychodynamic perspective. His model, showing how adaptation was influenced largely by active instrumental initiatives structured by social context and communication patterns, became the dominant research paradigm in the study of stress, coping, and social support.

Mechanic was one of the first researchers to recognize the possibilities yet also the worrisome issues related to managed care. His early articles on the rationing of healthcare established a framework for examining alternative allocation mechanisms. His work on the dynamics of physician payment in capitation and fee-for-service practices in the United Kingdom and the United States anticipated future studies of payment mechanisms. Other major contributions are noteworthy for examining risk selection, population health, policy challenges in addressing racial disparities, and trust relationships between clients and physicians.

Mechanic's recent work explores why reaching consensus and implementing significant reform in the American healthcare system is so problematic. He reasons that until the political will and concerted efforts for change favor the healthcare needs of the population and not the benefit to individuals and organizations who profit from healthcare, reform will remain elusive.

Mechanic has received many notable awards, including the Health Services Research Prize from the Association of University Programs in Health Administration (AUPHA) and the Baxter Allegiance Foundation; the Distinguished Investigator Award from the Association for Health Services Research; the Rema Lapouse Award and the first Carl Taube Award from the American Public Health Association (APHA); and the Distinguished Career Award for the Practice of Sociology, the

Distinguished Medical Sociologist Award, and the Lifetime Achievement Award in Mental Health from the American Sociological Association (ASA). He received the Benjamin Rush Award (with Lecture) from the American Psychiatric Association (APA) and gave the Inaugural Lecture of the Award in the Behavioral and Social Sciences honoring Matilda White Riley at the National Institutes of Health (NIH). Mechanic was elected to the National Academy of Sciences (NAS), and he was also the first sociologist elected to the national Institute of Medicine (IOM).

Carol A. Boyer

See also Access to Healthcare; Health Disparities; Managed Care; Medical Sociology; Mental Health; Public Health; Public Policy; Rationing Healthcare

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MEDICAID

Medicaid is a federal and state entitlement program that provides medical benefits to low-income and low-resource individuals and families who meet federal and state eligibility requirements. The Medicaid program is the largest source of medical funding for poor people in the United States. Medicaid is overseen by the Centers for Medicare and Medicaid Services (CMS) in the U.S. Department of Health and Human Services (HHS), but the program is primarily administered at the state level. The federal government provides financial assistance to states, with a greater share of financial support going to states with lower average per capita incomes. Although states vary widely in their program requirements and the services offered, there are certain groups and services that must be covered, including care for children, pregnant women, and disabled individuals. The State Children's Health Insurance Program (SCHIP) and the Program for All-Inclusive Care for the Elderly (PACE) are two special programs within Medicaid designed to cover uninsured children and to provide home- and community-based care to the elderly, respectively.

Background

Medicaid was initially planned as an addition to programs that provided cash assistance to vulnerable groups such as the elderly, disabled, and children and families. Medicaid was signed into law in 1965, as Title XIX of the Social Security Act. It was designed to be a joint program between the states and the federal government to provide medical assistance to qualified needy individuals. This program is primarily coordinated by state agencies with additional funding provided by the federal government.

Medicaid has grown significantly in recent years due to (a) increased use of services; (b) expanded coverage to larger and growing populations; (c) increased costs associated with medical care, drugs, and technology; and (d) an increased need for acute and long-term care. In 2006, total federal and state Medicaid costs reached \$303.8 billion, and the program covered close to 59 million people or 20% of the population in fiscal year (FY)

2005. Medicaid costs are expected to rise significantly in the coming years: Estimates place Medicaid costs in FY2009 at \$445 billion.

Who Medicaid Covers

To receive Medicaid, individuals or families must fit in a certain designated group. Although there is wide variation among the states, there are certain groups they must cover to receive federal funds. States must provide coverage to those already receiving federal income assistance, such as families eligible for coverage through Aid to Families With Dependent Children (AFDC). Although AFDC was replaced in the 1996 welfare reform bill with Temporary Aid for Needy Families (TANF), Medicaid generally covers anyone who would have been eligible under the AFDC guidelines of 1996. States must also cover individuals falling into one of the other seven *categorically needy* eligibility groups. Many of the designations for coverage require incomes at or below the federal poverty level; for reference, for 2007, 100% of the federal poverty level for a family of four was \$20,650 per year or \$1720.83 per month. (There are different poverty levels for families in Hawai'i, Alaska, and Washington, D.C.) However, having a low income is not sufficient to receive coverage through Medicaid: One must also fit in one of the designated eligibility groups. Furthermore, low-income persons with a certain amount of other assets usually would not be eligible for Medicaid until they "spend down" or deplete their assets to fit in a *medically needy* category (see below).

The categorically needy include (a) families eligible for AFDC (as of 1996), (b) pregnant women and children under 6 years old with a family income at or below 133% of the federal poverty level, (c) children aged 6 to 19 with a family income up to 100% of the federal poverty level, (d) caretakers of children under age 18 (or age 19 if the child is still in school), (e) Social Security Income recipients, (f) individuals receiving adoption or foster care assistance through Title IV of the Social Security Act, (g) people living in medical institutions meeting certain Social Security income requirements, and (h) certain Medicare beneficiaries.

In addition to the categorically needy groups, 34 states and the District of Columbia offer coverage to those fitting in designated medically needy groups. This category allows states to offer coverage to individuals who otherwise would not be covered under Medicaid. The conditions for the medically needy groups can be more restrictive than those for the categorically needy, but people are able to spend down to reach their state's medically needy level. If a state does choose to have a medically needy category, there are certain groups that the federal government requires the state to cover: (a) pregnant women for 60 days post-delivery, (b) children under 18, (c) certain newborns for the 1st year of life, and (d) some blind people. Additional groups that states may choose to cover include (a) children under 21 who are full-time students, (b) caretaker relatives, (c) people over age 65, (d) blind people, (e) disabled people, and (f) others who would be eligible if they were not already enrolled in a health maintenance organization (HMO).

There is a third group of people that receive benefits from Medicaid, and they fall in another category known as "special groups." For example, Medicaid will pay the Medicare premiums, deductible, and coinsurance fees for Medicare recipients who have incomes less than 135% of the federal poverty level. Medicaid will also pay Medicare Part A premiums for Qualified Working Disabled Individuals, who are disabled people who lose Medicare because they are working. These individuals must meet certain income requirements as well and have an income less than 200% of the federal poverty level. The Ticket to Work and Work Incentives Acts of 1999 allow states to expand their Medicaid eligibility to working disabled people. Disabled individuals between the ages of 18 and 65 can be offered Medicaid coverage, even if they exceed Social Security income guidelines, if they are able to and choose to work. If an individual's disabling condition improves, he or she may still be eligible for coverage but may have to share part of the cost of medical care. Certain states offer coverage for special medical conditions as well, but this varies widely by state. For example, 10 states and the District of Columbia offer Medicaid coverage to uninsured tuberculosis patients (for tuberculosis treatment only), and all 50 states offer Medicaid coverage for a specific

period of time for women with breast or cervical cancer. All 50 states provide long-term care services for Medicaid-eligible people who qualify for individual care.

Under the Personal Responsibility and Work Opportunity Reconciliation Act of 1996, also known as the *welfare reform bill*, legal resident aliens who entered the United States after 1996 are ineligible for Medicaid coverage for the first 5 years they are in the country. However, states have the ability to modify this requirement if they choose to cover legal resident aliens earlier. All states must provide and cover emergency services for legal aliens.

Program of All-Inclusive Care for the Elderly

PACE was designed to provide an alternative to institutional care for those over 55 years of age requiring skilled nursing care. Working in PACE teams, caseworkers manage and coordinate all the necessary care and services for these individuals, usually provided through adult day-care centers, home health care, and outpatient hospital care. The program helps individuals maintain a more independent lifestyle and still receive the care they need. The providers are paid exclusively through PACE, and they are not able to implement any limits or costs to the patients.

State Children's Health Insurance Plan

Title XXI of the Social Security Act enacted SCHIP and allows states to incorporate SCHIP as part of Medicaid or as an independent program. SCHIP provides additional federal funds for states to cover uninsured children through Medicaid. SCHIP reaches a group of children that would not have otherwise been eligible for Medicaid coverage by covering those up to age 19 whose parents' income is too high for Medicaid but too low to afford private insurance. SCHIP usually covers families with an income at or below 200% of the federal poverty level. All state SCHIP programs must include free immunizations and well-baby visits; other services may have a copay. The immigration status of the parents usually does not matter in regard to medical coverage for their children: As long as the child is a U.S. citizen, he or she will be covered by Medicaid.

Approximately 25% of all the children in the United States, and 50% of all the low-income children, receive their health coverage through Medicaid or SCHIP. Since SCHIP was authorized in 1997, the rate of uninsured children has dropped from 23% in 1997 to 14% in 2005. Children who are covered report similar access to primary and preventive care as children covered by private insurance (but lower access to dental care). Since SCHIP began, improved health outcomes for covered children have been reported, such as fewer emergency room visits for asthma and improved school performance.

What Medicaid Covers

There are certain services that states must provide coverage for, as mandated by the federal government. For people who fall in the categorically needy groups, states must provide coverage for (a) inpatient and outpatient hospital visits; (b) laboratory tests and X rays; (c) pediatric and family nurse practitioners; (d) nursing facility services for individuals over age 21; (e) regular screening up to age 21 as part of Early and Periodic Screening, Diagnosis, and Treatment (EPSDT); (f) family planning care and supplies; (g) rural health clinic care; (h) physician services; (i) dental services; (j) home health services for individuals eligible for nursing care, including home health aides and medical supplies; (k) nurse midwife services; (l) prenatal care; and (m) postpartum care for 60 days. For states with medically needy categories, the following services must be covered: (a) prenatal care and delivery, (b) postpartum care for certain groups under age 18, and (c) home health services for certain groups.

States have the option of providing additional services that are listed under Medicaid law and may also provide some services to certain groups of medically needy individuals. For some of these optional services, states are eligible for federal funding. Examples of additional services for which states can receive federal support are (a) diagnostic services, (b) clinic services, (c) care centers for mentally retarded individuals, (d) prescription drugs and prosthetic devices, (e) optometrist services and eyeglasses, (f) nursing services for individuals under age 21, (g) transportation services to and from medical care, (h) rehabilitation services and physical

therapy, and (i) home- and community-based care for individuals with chronic conditions.

How Medicaid Works

Medicaid is overseen by the CMS in the HHS. The federal government provides some guidelines for who will be covered and how, but the requirements and programs vary widely by state, and states take the primary role in administering their statewide Medicaid programs. Medicaid is funded through federal and state funds, and the federal government pays different shares for different states. The share from the federal government is determined by the Federal Medical Assistance Percentage (FMAP), which uses a formula comparing the state's average per capita income with the national average per capita income. This federal-funding share is inversely associated with the state's per capita income. Thus, in a state with a lower per capita income, the federal government will pay a larger share of Medicaid, and in states with higher per capita incomes, the federal government will pay a smaller share. The government share, or FMAP, must be between 50% and 83% of Medicaid costs. In 2008, the federal minimum FMAP was 50% with the highest share, paid to Mississippi, at 76.29%. The FMAP for Washington, D.C. was recently raised permanently from 50% to 70%. For children covered under SCHIP, the federal government pays a higher share, averaging about 70% for all states. The federal government reimburses 100% for care through the Indian Health Service (IHS), a branch of the HHS. It also provides extra financial support to the 12 states that provide the highest rates of emergency care to undocumented immigrants.

There has been recent growth in the use of managed care in Medicaid as an alternative method of both payment and delivery of services. States can apply for waivers from the government in designing and implementing Medicaid managed-care programs. Two sections of the Social Security Act describe waivers available to states in this area: (1) Section 1915(b) allows states to design "innovative healthcare delivery or reimbursement systems" and (2) Section 1115 allows states to carry out demonstration projects to test programs designed to cover uninsured individuals without significantly raising costs. In 2006,

approximately 65% of Medicaid recipients were enrolled in managed-care programs, up from only 14% in 1993.

The state is responsible for paying the providers who offer services to Medicaid recipients and accept Medicaid payments. Providers are usually paid through fee-for-service methods or prepayment programs such as the managed-care programs mentioned above. It is also the responsibility of states to ensure that there are enough providers in certain geographic areas who accept Medicaid. For hospitals that treat a disproportionate number of Medicaid recipients and other low-income or uninsured people, the state must make additional payments through a system known as the Disproportionate Share Hospital Adjustment. Some Medicaid beneficiaries may pay a small copayment for services, but there are certain groups that the federal government excludes from having to pay any share of medical costs. These special groups include (a) pregnant women, (b) children under the age of 18, (c) hospital or nursing home patients who would otherwise pay for their own care, and (d) anyone receiving emergency care or family planning services.

States have the power to determine the amount and duration of services they will cover, such as the number of days in the hospital or the number of doctor visits. However, federal law stipulates that these limits be fair and not discriminate on any basis. For example, states cannot limit coverage for medically necessary services for children, such as those considered part of EPSDT.

Like the waivers for managed-care programs and the inclusion of extra groups, states can also apply for waivers to cover additional services such as community- or home-based services for individuals who would otherwise require institutionalization. However, to receive a waiver the state must offer evidence that the plan or service addition is cost-effective.

In administering the state Medicaid program, each state is responsible for (a) setting the rates of payment; (b) establishing eligibility guidelines; (c) determining the types and durations of eligible services; (d) informing recipients about participating providers; and (e) ensuring that recipients receive timely, quality, and appropriate medical care. In addition, the state legislature is able to change state Medicaid policies.

The Cost of Medicaid

Total Medicaid costs for 2006, including both the federal and state expenditures, reached approximately \$303.8 billion. Of this figure, 57.8% was for acute care, 36.6% for long-term care, and 5.6% for disproportionate-share hospital payments.

Considering the approximately 59 million Medicaid recipients, the overall average cost per person is about \$4,662, but the costs vary considerably among certain groups. For example, children constitute about 50% of all Medicaid recipients and are covered at an average cost of about \$1,617 per child. Adults make up about 26% of Medicaid recipients at an average cost of \$2,102 per person. Care for elderly and disabled Medicaid recipients costs the most by far: the elderly make up 10.3% of Medicaid recipients and cost an average of \$11,839 per person; disabled individuals covered by Medicaid (14.1% of all recipients) cost an average of \$13,524 per person.

In the coming years, long-term care will continue to be a large and growing expense for Medicaid. In 2006, Medicaid paid \$48.6 billion for nursing facilities, accounting for 41% of the total costs in these areas. The program paid an additional \$45.4 billion for home health and personal care.

Dual Eligibility

Under certain circumstances, individuals can be dually eligible for both Medicare and Medicaid. Medicare beneficiaries whose incomes and resources are low enough to qualify in one of Medicaid's eligible categories can receive Medicaid assistance in addition to their Medicare coverage. In these cases, Medicaid supplements Medicare coverage, and additional services not covered by Medicare may be covered (e.g., nursing home care beyond Medicare's 100-day limit). The two main groups of Medicare recipients who are eligible for assistance from Medicaid with Medicare premiums and copayments are known as (1) Qualified Medicare Beneficiaries (QMBs) and (2) Specified Low-Income Medicare Beneficiaries (SLMBs). QMBs are Medicare recipients with incomes less than 100% of the federal poverty level; for these individuals, Medicaid pays their Medicare Part A and Part B premiums, coinsurance, and deductibles. For SLMBs, an income less than 120% of the federal poverty level is sufficient to meet the

eligibility requirement, and Medicaid will pay their Part A and Part B premiums. A third group—working disabled people who have incomes less than 200% of the federal poverty level and who have lost Medicare because they have returned to work—are known as Qualified Disabled and Working Individuals; they are eligible to buy Medicare Parts A and B, and Medicaid will pay their Medicare Part A premiums. A final group of qualified individuals—those who have Medicare and are between 120% and 175% of the federal poverty level—are also eligible to receive Medicaid assistance in paying their Part B premiums. With Medicare Part D recently enacted, Medicaid will no longer provide prescription drug benefits for dually eligible Medicare recipients. It must be noted that in all these cases of dually eligible people, Medicare will always pay first because Medicaid is the payer of last resort. Nationwide, about 6.5 million Medicare recipients receive supplemental assistance from Medicaid.

Future Implications

In the future, managed care will likely become a more popular method as states seek to provide and pay for care for Medicaid recipients and, at the same time, control costs. Medicaid costs will continue to rise as the population ages, long-term care use becomes more frequent, eligible populations grow, and the cost of medical care increases.

Emily Rosenthal

See also Centers for Medicare and Medicaid Services (CMS); Coinsurance, Copays, and Deductibles; Cost of Healthcare; Fee-for-Service; Health Maintenance Organizations (HMOs); Long-Term Care; Medicare; State Children's Health Insurance Program (SCHIP)

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National Conference of State Legislatures (NCSL):
<http://www.ncsl.org>

MEDICAL ERRORS

Until the 2000 report by the national Institute of Medicine (IOM) *To Err Is Human: Building a Safer Health System*, medical errors were a relatively low priority in the U.S. healthcare system. Medical errors were regarded as uncommon. Physicians and other healthcare providers generally attributed them to “a few bad apples” and the occasional slip. However, data pointing to the pervasiveness of the problem were already available, leading the IOM to estimate that between 44,000 and 98,000 Americans die each year as a result of medical errors.

Since that report, medical errors and patient safety have become a major focus of health services research and policy making, providing a key role for the former in shaping the latter, as both government and nongovernmental organizations

develop regulations and guidelines for reducing errors to improve patient safety and the quality of care. There has also been a major shift from blaming the individuals who make errors to recognizing that the individuals function within systems and that those systems critically influence individual performance.

Definitions and Concepts

Key definitions and concepts—many adapted from systems-based research on error prevention in other industries—underlie the current efforts to understand and prevent medical errors. An error is defined by the IOM as either the failure of a planned action to be completed as intended or the use of a wrong plan to achieve an aim. The former is referred to as an *error of execution* and the latter as an *error of planning*. This formulation is based on the work of James Reason and others who extensively studied accidents in aviation and other industries.

Errors of execution are due either to *slips* or *lapses*. A slip is an observable error of execution, such as when a surgeon inadvertently cuts the wrong tissue. A lapse is unobservable, as when an internist forgets to order antibiotics for a patient with pneumonia after intending to do so. In both cases the physician knew what the right thing was to do and intended to do it. In contrast, errors of planning are mistakes in that the actions proceeded as planned but the plan was wrong.

Errors may be classified as *biomedical* or *contextual*, the former occurring because of inattention to processes occurring within the boundary of the skin and the latter from inattention to processes expressed outside that boundary—that is, processes that form the context of a patient’s illness. Failing to prescribe a medication that effectively treats a serious condition is a biomedical error. Prescribing a medication that a patient cannot afford when a less costly effective medication is available is a contextual error. In both instances, the patient does not obtain the necessary therapy: in the first, from a failure to attend correctly to the patient’s disease and, in the second, from inattention to the context surrounding the disease.

Fortunately, not all errors result in an *adverse event*, the term for an injury that is caused by medical mismanagement. Neglecting to wash one’s

hands prior to examining a postsurgical wound is an error, for instance, but in most cases this does not result in a wound infection because of the patients' inherent capacity to fight off infection. Conversely, adverse events may occur despite flawless care: A patient's surgical wound may become infected despite excellent sterile technique. Harm that is specifically attributable to error is termed a *preventable adverse event*.

Occasionally, preventable adverse events are due to *negligence*—when the care provided falls below the standard expected of a reasonable and knowledgeable practitioner under the circumstances, as established in a court of law. Most preventable adverse events, however, are considered to be the end result of conditions in the organization that preceded the actual incident.

James Reason distinguished *active* from *latent* errors. Latent errors may include the faulty design of instruments or technologies, poorly installed or functioning equipment, or a dysfunctional work environment where communication or work conditions are not suitable to meet the demands of the job. They may be difficult to detect, but they form the backdrop for the observed, or active, error. The point where an active error occurs is also referred to as the *sharp end* of the system, as in the slip of a surgeon's knife, whereas the latent preconditions for the error are referred to as the *blunt end*, as in the faulty lighting or poor staffing that diminishes an operator's technical performance at the time of the preventable adverse event.

The structured process for identifying contributing factors such as latent errors leading up to an incident is often described as *root cause analysis*, or *systems analysis*. A critical incident may be a near miss or close call, in which an error or series of errors did not produce an injury only because of chance. It may also be a *severe adverse event*, sometimes termed a *sentinel event*, in which severe injury or death to a patient occurred. Reason has described what he calls the "Swiss cheese" model: the view that "holes" may be identified in every layer of an organization's systems of operation. In organizations that lack a culture of safety, where teams may not work well together, or equipment is poorly functional, the holes may be sufficiently large and numerous that it is not uncommon for them to "line up," leading to error chains that result in a high incidence of preventable adverse events.

The Scope of the Problem

Safety is defined as freedom from accidental injury. Because of the high prevalence of preventable adverse events that injure patients, healthcare is unfortunately not as safe as it could be. Early awareness of the magnitude of the problem emerged in 1991 from the Harvard Medical Practice Study of approximately 30,000 randomly examined discharges from 51 hospitals in New York State in 1984. That study found that 3.7% of the hospitalizations were prolonged or resulted in disability because of an adverse event. More than half (58%) of these adverse events were deemed preventable, and 27.6% met the legal criteria for negligence. Nearly one fifth (19%) of the adverse events were medication related, 14% were due to wound infections, and technical complications accounted for 13%. Overall, 13.6% of adverse events were fatal.

Similar findings emerged from a subsequent corroborative study published in 2000 and are based on an analysis of 15,000 hospital discharge records from Colorado and Utah in 1992. The investigators selected a representative rather than a random sample of hospitals, and the records were reviewed by only one rather than two physicians but with greater standardization of the review process. Adverse events were found to be slightly less common at 2.9%; however, the proportions deemed preventable and negligent were nearly the same as those found in New York at 53% and 29.2%, respectively.

The most significant difference between the two studies was the incidence of adverse events that were fatal: The rate of 6.6% in Colorado and Utah was about half the number in New York. Variations in study design, margin of error, and actual differences in error rates in the two studies could all contribute to the discrepant findings. Extrapolating from these numbers to the more than 33 million hospital admissions in the nation in 1997, and excluding unpreventable adverse events from the analysis, produced the widely quoted estimate that medical errors may cause 44,000 to 98,000 preventable deaths per year.

Smaller studies and the recognition that several categories of errors are missed using exclusively hospital-based discharge data has led many to believe that the estimates of preventable adverse

events and fatal incidents, as serious as they are, nevertheless *underrepresent* the true magnitude of the problem. In an analysis of more than 1,000 intensive-care units (ICUs) and surgical patients admitted to a teaching hospital, preventable adverse events were identified in 45.8% of the cases, with 17.7% leading to disability or death. The chance of an adverse event increased by about 6% per day of hospitalization.

Furthermore, because most methods for identifying errors and their adverse effects are limited to assessments of the medical record, they miss contextual errors, which are rarely documented. For instance, the failure to take into account a patient's lack of transportation to a Coumadin clinic when prescribing the blood thinner for atrial fibrillation may lead to a preventable bleed, but the medical record will show only that the patient did not adhere to an apparently correct plan of care. Identifying such errors requires case analysis, direct observation, or standardized patients to simulate the conditions under which they might occur.

Preventable Adverse Drug Events

Medication errors are the most studied medical errors because of the extensive charting associated with medication administration and the ever-increasing volume of medications administered each year. Medication errors may occur during (a) prescribing, (b) dispensing, (c) administering, (d) monitoring, and (e) the systems management control process. The latter includes failures to identify drug interactions or to coordinate the administration of medications with other aspects of care (e.g., holding anticoagulation medication before a surgical procedure). When a medication causes an injury it is called an *adverse drug event* (ADE). When such an event is due to medication error it is termed a *preventable adverse drug event*.

At least 1.5 million preventable adverse drug events occur each year in the United States as a result of medication errors. Of these, about 22% occur in hospitals, 31% in outpatient Medicare patients, and 47% in long-term care nursing homes. These data exclude (a) all outpatients under 65 years of age who are not enrolled in the Medicare program, (b) errors patients made taking their own medications, and (c) errors of omission when healthcare providers neglected to prescribe

medications with established benefit (e.g., beta blockers for postmyocardial infarction).

A compendium of data on medication errors and preventable adverse drug events is contained in the 2007 national IOM publication *Preventing Medication Errors*. Prescribing and administration errors are the most common. In hospitals, between 0.1 and 0.3 medication orders are incorrect per patient per day. Medications are incorrectly administered 11% of the time, not counting "wrong time" errors. On average, one administration error, such as the wrong dosage or the wrong rate of administration, occurs per patient per day.

Not all healthcare facilities have the same error rate. In studying 36 facilities, medication administration error rates ranged from 0% to 26%. Error rates have been linked to incomplete or illegible prescriptions and, at the blunt end of the system, to hiring practices that lead to high patient-to-nurse ratios with high nurse workloads.

The morbidity and costs of preventable adverse drug events are high. A 1997 study conservatively estimated that 400,000 inpatient adverse drug events occur in the United States per year at a cost of \$5,857 per incident. Adjusting for the rise in healthcare costs and inflation, the additional hospital costs incurred per inpatient preventable adverse drug event in 2008 was \$12,403 with avoidable healthcare expenses totaling \$5 billion. Based on a 2000 study of the ambulatory costs of Medicare patients (again making similar adjustments), just in this subset of the nation's population, outpatient preventable adverse drug event costs in 2008 are \$3,406 per incident and \$1.5 billion nationally. Note that none of these estimates take into account lost earnings, losses related to not being able to carry out the activities of daily living (ADL) such as self-care, and the effects of pain and suffering. The calculations also do not include the costs related to preventable adverse drug events when patients do not take their medications correctly or due to overuse and underuse errors by healthcare providers when prescribing.

Disclosures of Errors

Physicians have long feared disclosing medical errors to patients because of concerns that they are more likely to be sued. Employers and insurers shared similar concerns and did not encourage

disclosure. However, recent evidence clearly shows that physicians who exhibit transparency and say they are sorry for the medical error are, in fact, substantially less likely to be sued. Furthermore, the legal penalties for deception—for withholding information or misleading patients—have become a further incentive for truth telling.

Several ethical tenets commonly applied to the physician–patient relationship also mandate full disclosure of adverse events. First, adverse events often have consequences that require medical intervention. Patients can only participate in decision making regarding subsequent care if they are fully informed of the circumstances necessitating further intervention. In this respect, disclosure is an essential component of autonomy and informed consent.

Second, truth telling is considered essential to respect for persons. When patients entrust themselves to physicians, they expect full transparency, even with regard to near misses. In studies where patients have been given hypothetical scenarios involving even minor incidents related to their care, 98% say that they would want to know what happened. Furthermore, they have indicated that they would be more likely to sue their physicians if they later discovered that information had been withheld or covered up. Hence deception— independent of the actual physical harm that occurred—is regarded by patients, almost universally, as a harm in itself.

Third, full disclosure is essential to justice and fairness. Although they may, in fact, be less likely to sue, patients have the right to seek compensation for injuries when they occur, if they so choose.

Error Reporting

In addition to the legal and ethical imperatives for candor with patients about errors related to their care, disclosure of all such incidents internally and to regulatory bodies through formalized reporting systems is critical to accountability and quality improvement. There are a number of obstacles, however, to effective error reporting systems. Physicians may fear negative repercussions, including malpractice litigation, disciplinary action, or loss of hospital privileges. They may be hesitant to personally acknowledge errors in a profession that emphasizes perfectionism. They may be skeptical

that their reports, which are often time-consuming to file, will be used to improve care. At the institutional level, organizations also face concerns about how they are regarded and practical issues about how best to use the data. A major challenge, then, is creating reporting systems that (a) are easy to access, (b) provide certain legal protections to reporters and institutions, and (c) use the data to improve the processes of care.

Reporting systems for medical errors and adverse events can be mandatory or voluntary. Also, reporting can come directly from the provider, or reports may be submitted by the organization. Finally, reporting can be to an external monitor, such as a state or federal entity, or remain internal to the organization with periodic external audits. Each has its advantages and disadvantages. For instance, direct reporting by practitioners to a national database provides frontline information and bypasses the employer, which may be reassuring to a reporter who is reluctant to notify management each time an error occurs. On the other hand, internal tracking of errors enables organizations to identify system problems and make the necessary changes.

Since the mid-1980s, a growing number of individual states have had adverse event reporting systems of various kinds. The number of reports filed has ranged from fewer than 20 in a year in some cases to tens of thousands in others, indicating the severity of the problem of underreporting. States have also varied greatly in the information made available to the public. Patient confidentiality is always maintained, but whether the names of physicians, hospitals, and health systems or the numbers of adverse events per site are released and whether the data are freely accessible on the Internet all vary. Synthesis and analysis of data, particularly across states, has been almost uniformly poor.

At the federal level, the U.S. Food and Drug Administration (FDA) is an example of a national reporting program for adverse events linked to medications and other medical products. All malfunctions, serious injuries, and deaths must be reported by either the facility or the manufacturer, depending on the circumstances. However, these problems are generally not due to provider or systems errors at the organizational level. The focus is on identifying product defects or risks associated with products through postmarketing surveillance.

To address the unmet need for a comprehensive reporting system that is easily accessible, provides legal protections, and has analytic and response capabilities, the U.S. Congress passed the Patient Safety and Quality Improvement Act of 2005, which established Patient Safety Organizations (PSOs) to collect and process confidential information reported by healthcare providers. The law gives full confidentiality protection to reporters and limits the use of the information in legal proceedings. Both public and private entities—for-profit or not-for-profit (excluding insurance organizations)—may apply to become PSOs if they are capable of meeting the complex requirements to qualify. The act also created a network of patient safety databases (NPSDs) for centralizing data to establish national as well as regional statistics related to errors, adverse events, and the effect of safety improvement initiatives.

Internationally, concerns about medical errors, adverse events, and the strategies for reporting them have developed in parallel. Australia, Canada, and the United Kingdom have all initiated reporting systems. The World Health Organization (WHO) has created the World Alliance for Patient Safety, following a resolution in 2002. Its charge includes a broad range of safety initiatives, such as data collection on adverse events related to healthcare delivery in developing countries, as well as guidelines for adverse event reporting.

Despite these efforts, physicians indicate that medical-error-reporting systems are still inadequate. A survey of U.S. physicians found that they were more likely to discuss errors with their colleagues than make a formal report. Only a third of physicians felt that reporting systems at their organizations were adequate. Few had confidence in the process. Nevertheless, 83% indicated that they had, at some point, filed a formal report of an error. Major areas where physicians wanted to see improvement were in assurances that (a) reports remain confidential and nondiscoverable, (b) the data will guide system improvements, (c) there will be no penalties or other negative repercussions, and (d) the process will take less than 2 minutes to complete.

Although physicians have concerns about the reporting process, interest in the problem of errors and how to prevent them is high. Most physicians

now believe that reporting errors is necessary to improve patient safety, and most feel that they are not getting adequate information about how to prevent them. Increasingly, physicians are embracing a culture of safety.

Progress in Reducing Errors

There has been a major shift in attitudes toward medical errors and the need to protect patients from preventable harm. In the peer-reviewed medical literature, articles addressing issues of patient safety more than tripled during the 5 years following the 2000 IOM report, compared with the previous 5 years. The number of federally funded patient safety research awards increased nearly 30-fold. Starting in 2001, the U.S. Congress has appropriated \$50 million annually to fund many of these studies.

What has been the impact of such investments? Evidence that healthcare has become substantially safer is not yet strong. There have been discrete studies showing improvements in certain areas. For instance, hospitals with tight infection control procedures have documented a reduction in hospital-acquired infections, and fatalities related to the accidental injection of concentrated potassium chloride have been prevented by removing the product from nursing unit shelves. There may be many other such examples of a positive effect. Underdeveloped error tracking systems have confounded efforts to assess progress.

A number of organizations, along with the government, have committed to the patient safety movement, setting specific goals and strategies for preventing medical errors. The Agency for Healthcare Research and Quality's (AHRQ's) Center for Quality Improvement and Safety leads the federal government's efforts to (a) set standards and measures called *patient safety indicators*; (b) educate healthcare providers, administrators, and the general public; and (c) guide the research agenda. The Joint Commission has played a key role in enforcing change by requiring hospitals to follow specific error prevention strategies, such as (a) improved patient identification, (b) surgical-site verification, and (c) standards for communicating information. Private-public partnerships—such as the Institute for Health Improvement's (IHI's) 100,000 lives campaign, which enlisted thousands

of hospitals to adopt proven methods of reducing avoidable deaths—have been cosponsored by the federal AHRQ, the Centers for Disease Control and Prevention (CDC), and the Centers for Medicare and Medicaid Services (CMS), exemplifying a broad-based commitment to make health-care safe. Building on that momentum, the IHI and its partners embarked on a “5 million lives” campaign to protect patients over a period of 2 years from 5 million incidents of medical harm. The movement to eliminate medical errors is still young but maturing rapidly.

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See also Agency for Healthcare Research and Quality (AHRQ); Health Report Cards; Institute for Healthcare Improvement (IHI); International Classification for Patient Safety (ICPS); Joint Commission; Patient Safety; Pay For Performance; Quality of Healthcare

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<http://www.fda.gov>

MEDICAL GROUP PRACTICE

Medical group practice, a form of medical practice that dates back to the 1800s, can be defined in a number of ways. The Medical Group Management Association (MGMA), an organization representing group practice executives, administrators, and managers, and the American Medical Association (AMA), the nation’s largest physician association, consider medical group practices to have the following elements: (a) a formal or legal arrangement; (b) three or more physicians; and (c) shared business and clinical operations, facilities, staff, and equipment.

Recent federal health legislation regarding physician self-referral, known as the Stark legislation (named for U.S. Congressman Fortney “Pete” Stark), has defined medical group practice in a slightly different manner. First, the federal legal definition is broader in scope, including groups with two or more physicians. At the same time, this definition applies more stringent criteria that stipulate that (a) all physicians in the group must provide a full range of patient care services appropriate to their specialties and be responsible for the bulk of the care provided through the group; (b) group income and expenses must be distributed according to an established plan; and (c) decision making in the group must be centralized with respect to functions such as governance, budgets, billing, and use.

Regardless of how they are defined, the ways medical group practices look and act vary considerably. Medical group practices may be composed of physicians with the same specialty or physicians with different specialties. And they can include

other types of medical professionals such as dentists and podiatrists. These groups may be embedded within larger health systems. They may work out of a single location or many locations. Medical group practices may or may not be physician owned. These practices can range in size from a few physicians to thousands of primary-care and specialty-care providers. One of the best-known medical group practices in the nation is the Mayo Clinic, which is based in Rochester, Minnesota, and employs more than 3,300 physicians, scientists, and researchers at multiple sites across the country.

Importance

Medical group practices are important to the study of health services research because they represent an increasingly common vehicle for the delivery of medical care. They also, theoretically, hold much potential for improving the quality and efficiency of the delivery of medical services.

The number of medical group practices and the number of physicians practicing in them has grown over time. The AMA reported that there were just over 4,000 medical group practices in 1965 but nearly 20,000 in 1996, representing approximately 11% and 32% of all physicians in the nation. More recently, the Agency for Healthcare Research and Quality (AHRQ) supported a collaborative study between the MGMA and the University of Minnesota School of Public Health that sought to establish a nationally representative database of medical group practices. This effort resulted in the estimate that the number of medical group practices had grown to nearly 37,000 in 2003 and that the physicians in them represented almost 67% of all office-based physicians in the nation. Based on these findings, medical group practices deliver a large proportion of the medical care in the nation.

One reason for the establishment and continuation of medical group practices is that increased medical specialization and technical complexity require the integration of multiple physicians into a single practice to provide appropriate and necessary patient care services. Medical group practices are also an attractive employment option for many physicians because they may provide certain advantages over solo practice. For example,

medical group practices often provide malpractice coverage, the sharing of on-call duties, and the intellectual challenge and stimulation of working with colleagues from a variety of disciplines and specialties.

Medical group practices are thought to contribute to the efficient and high-quality delivery of medical care in a number of ways. Some medical group practices provide a wide and complex range of services on-site. Medical group practices may contain costs through centralized purchasing, uniform coding and billing, and the sharing of auxiliary medical and administrative staff. These practice groups may be able to enhance access to care through extended office hours. A medical group practice's organizational culture—including factors such as the extent to which the group's physicians share information, are innovative and collegial, and subscribe to a group identity—is also thought to affect healthcare costs and quality.

Future Implications

Medical group practices are an increasingly important feature in the healthcare delivery system in the United States. As a result, it is increasingly important and necessary when conducting health services research to consider their impact on the quality, effectiveness, and efficiency of the delivery of medical care. However, given the large number of medical group practices and the wide variation in the ways they are organized, the influences of this type of practice may be difficult to disentangle from other causal factors in an already complex system of healthcare delivery. These factors can include (a) a physician's training, (b) the medical group's payment structure, (c) its organizational culture, (d) the influences of partners and colleagues, (e) the rules and standards established by the health maintenance organizations (HMOs) and health insurance companies with which the group is contracted, (f) patient expectations, and (g) community standards. As knowledge of medical group practices and their operations continues to grow, health services researchers will be able to make vital improvements in the delivery of healthcare.

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See also Access to Healthcare; American Medical Association (AMA); Equity, Efficiency, and Effectiveness in Healthcare; Forces Changing Healthcare; Health Workforce; Managed Care; Physicians; Quality of Healthcare

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- Medical Group Management Association (MGMA):
<http://www.mgma.com>

MEDICALIZATION

Medicalization is a process through which human problems come to be defined as medical problems. In brief, society considers certain behaviors to be deviant. But "deviance" is not inherent in the behavior; instead, it is the result of social judgments that shift over time in response to the ideas expounded by the social institution prevailing at the time. For example, deviant behavior was seen as sinful when religion was the predominant social institution and in a position to define the nature of human problems. As confidence in empirical explanations began to take hold, the view that

deviance is a matter of *sinfulness* gave way to the view that deviant behavior is a violation of social norms and laws, that is, *badness*. Medicalization signifies the most recent shift, transforming the definition of deviance again, this time from *badness* to *sickness*.

The Power to Define Sickness

The concept of medicalization was introduced during the second half of the 20th century when Americans were registering rising distrust in and disillusionment with the values being expounded by the leaders of most social institutions. Hence, the times were conducive to rejecting a socially defined view of deviance in favor of a medical-based perspective. Critics argued, and many observers agreed, that the prerogative to determine what is and what is not a medical problem gives physicians tremendous power. The question of whether this is more socially beneficial or detrimental remains unsettled.

Talcott Parsons (1902–1979), an American, Harvard University sociologist, is credited with initiating discussion of the vital social role played by physicians in differentiating between true sickness and malingering. He based this proposition on the premise that social stability and continuity require that all members of society fulfill their respective social roles. Because the "sick" role offers the benefit of excusing a person from normal responsibilities, it is important to ensure that people do not take inappropriate advantage. By identifying what constitutes real illness, physicians are in a position to grant patients a temporary exemption from their normal role responsibilities. By labeling symptoms as true illness, physicians are granting the patient a period of "legitimated deviance." Physicians then go on to restore the sick person to full health so that he or she can carry out the normal role expectations. Because physicians are willing to accept this weighty burden, Parsons maintained that they should be generously rewarded.

Parsons's model of the sick role depicted recovery from acute illness as the only acceptable resolution to a period of legitimated deviance. Detractors pointed out that this portrayal meant that those who did not or could not get well were doomed to being permanently labeled as deviants.

A number of observers have made the point that having the power to determine whether the symptoms patients present with are, in fact, indicative of a disease gives physicians undue power to act as moral arbiters. From time to time, the discovery of a newly identified disease reinvigorates the charge that physicians have too much power and that patients' complaints are too often dismissed as illegitimate. The discovery of Lyme disease provides a vivid illustration. According to media reports, it was only through the efforts of one courageous woman that the disease was finally identified. Because her symptoms were so common (i.e., headaches, body rashes, and flu-like conditions), she was diagnosed with various conditions from poison ivy to hysteria by the many physicians she visited. The media reported that the physicians denied the existence of this particular patient's disease because it did not fit a recognized diagnostic label. Not only was she repeatedly told that she was a hypochondriac, she was denied the benefits of the sick role as well as treatment.

The story, which received much media attention at the time, had the effect of bringing numerous patients to physicians' offices with similarly vague symptoms insisting that they, too, had Lyme disease. When physicians did not find evidence of the disease, many of these patients became convinced that callous physicians were unwilling to treat them, fueling the view that medicine's power was certainly excessive and probably socially dysfunctional.

The question whether physicians should have the final say in determining whether a particular set of symptoms is indicative of the existence of disease—the essence of medicalization—continues to be contentious, particularly as groups of people who share some experience that they believe has caused them to experience a particular set of symptoms insist that physicians identify those symptoms as a disease or syndrome. Understanding the ramifications associated with the sick role helps explain the persistent efforts on the part of many of those afflicted with various human problems to portray them as illnesses.

Physicians and the Promotion of Medicalization

Whether physicians are actively engaged in promoting and sustaining medicalization is another

point of debate. A number of commentators have taken the position that the medical profession has, in some instances, purposefully engaged in expanding its scope of control. Michel Foucault, for example, noted that early practitioners of psychiatry were particularly zealous in their efforts to define the limits of acceptable social behavior. Thomas Szasz stated that psychiatrists were finding evidence of mental illness in people who were simply rejecting the roles that society imposed on them. He maintained that psychiatrists were guilty of trying to convince such people that their behavior indicated that they were "sick," and they required medication to help them fit in the role or roles, often undesirable ones, that society had prescribed.

Similarly, the idea that women who resisted the limited range of social positions and roles dictated by society from the post-World War II period through the rebellious 1960s were likely to be the objects of such labels and treatment is, at least in some circles, now a matter of conventional wisdom. Feminists argue that the medical profession continues today to impose its definition of the feminine ideal: They say that plastic surgeons are defining our standards of beauty, both facial and in body shape, and that other physicians are ready to prescribe a wide range of pharmaceuticals—including weight-loss medications, mood-altering drugs, sleep aids, energy boosters, and so on—more to women than to men. The fact that some women demand such treatments they attribute to a distorted set of social values which are promoted by a wide range of self-interested parties who benefit from the medicalization of such common conditions as aging-related changes.

Physicians' motivations for actively promoting medicalization, to the extent that they may have been doing so, have not yet been examined closely. Whether physicians are motivated by the promise of increased income, as the representatives of managed-care organizations have argued; or by greater social prestige and authority, as some social scientists maintain; or are truly interested in improving the lot of people who are not only plagued by pain and suffering but stigmatized as well, which is the position taken by spokespeople for the medical profession, has not been the subject of much debate or investigation.

Eliot Freidson is one of the few social scientists whose observations addressed the issue directly. He argued that physicians are not so much motivated by the possibility of increased income as by the opportunity to gain professional recognition and possibly have their names attached to the discovery of a new disease or syndrome. He proceeded from the observation that medicine had been very successful in its efforts to define the scope of and monopolize medical work through medical licensure. That, he pointed out, effectively prevents other health practitioners from ministering to patients' complaints using treatments other than those approved by the medical profession. Freidson coined the term *professional dominance*. He argued that physicians behave in a dominant fashion in their interactions with anyone over whom they can impose their authority, from patients to other healthcare workers. Feminists embraced Freidson's observations on the role physicians assigned to nurses—who are overwhelmingly female—as handmaidens to physicians.

It is worth noting that critics of medicine's power were most vocal during the same years that society was registering especially high regard for the medical profession: during the post-World War II years until the end of the 1970s. Throughout this period, prestige surveys consistently accorded medicine the top rank compared with other occupations. Surveys documenting the level of trust society was willing to accord particular social institutions consistently found that medicine inspired more trust than other social institutions. The decline in trust in the profession of medicine coincided with the rise of managed care during the 1980s. The spokespeople for managed-care organizations presented themselves as interested in protecting patients from physicians who, they said, were more interested in their own pocketbooks than their patients' welfare. Thereby, in a few short years, the corporate sector succeeded at what social critics had been striving to accomplish for several decades.

The charge that physicians engage in medicalization lost much of its condemnatory power in this atmosphere, given that a wide range of other failings were also being attributed to the profession. Yet patients have generally said, and continue to say, that their own physicians are wonderful but that they are the exception.

Medicalization and the Role of Other Interested Parties

The criticism aimed at the medical profession that it promotes the medicalization of routine human problems has not had an ameliorating effect because the list of additional agents interested in promoting medicalization continues to expand. Many members of the public afflicted with certain conditions have been active in their efforts to aid, abet, and pressure medicine to define those conditions as sickness. One practical reason why patients would want to do this is that having a condition defined as an illness results in medical insurance coverage. Another reason is that there are certain conditions that members of the public want very much to see labeled as sickness to avoid the stigma attached to the alternative: Sickness indicates that the cause of the problem is biological and not the result of weakness of character—that is, it is sickness not badness.

Attention deficit disorder, hyperactivity, and hyperkinesis are illustrative of this phenomenon. Some parents and teachers initially identified socially disruptive behaviors as problematic and requested medications that will reduce the incidence of such behavior. Physicians must, of course, agree to diagnose the condition as an illness and prescribe medications designed to control the behavior. The thrust of the criticism is that the diagnosis is being too liberally applied. An important question that does not generally arise is whether diagnosing and medicating the child as having a “minimal brain dysfunction”—that is, a sickness—is more or less damaging than determining that the child is a social deviant who willfully misbehaves and deserves to be punished—that is, that the child is bad.

Further evidence that the medicalization of children's behavior is not waning is apparent in the discovery of new syndromes: “school refusal behavior,” for example, (i.e., skipping school), which has recently been identified by some psychiatrists as a sign of an anxiety disorder requiring medical treatment.

Posttraumatic stress disorder (PTSD) is another example of a more or less successful effort to have particular behaviors recognized as illness rather than badness. The designation allows those having difficulty readjusting to civil society after wartime

service in the military to receive the benefits that go along with the sick role—from the psychological and emotional benefits that come with the extension of sympathy, to the greater understanding and tolerance of absence from work due to a range of physical and psychological problems.

There are also instances of a less successful transition from badness to sickness as reflected, for example, in the social attitude toward alcoholism. Many individuals who have this problem have been unwavering in their efforts to have society accept the view that alcoholism is a disease. The Yale School of Alcoholism Studies (which emerged in the 1930s), now the Rutgers Center of Alcohol Studies (as of 1962)—neither of which has operated under the auspices of medical practitioners—have provided the main impetus for dissemination of this definition. Physicians, generally, have been less eager to define alcoholism as a disease; in part, no doubt, because alcoholism does not lend itself to a traditional medical approach to either prevention or cure. Medical treatment of the health problems brought on by alcoholism, though, is uncontested.

The role played by the public health community must be included in the discussion of medicalization because of its stance on the value of punishment versus therapeutic intervention in controlling certain behaviors. Members of the public health community not only oppose the use of legal sanctions to reduce the prevalence of deviant behavior, they also oppose treating people who engage in destructive and risky behavior on an individual basis. They hold that control of such behavior would be better addressed through population-based solutions. Public health practitioners have argued that the morbidity and mortality associated with violence, intravenous drug abuse, and other forms of substance abuse should be viewed in much the same way as other man-made diseases—smoking-related illnesses, for instance—and treated accordingly. They point out that intervention at the level of treating the individual who is suffering the consequences of engaging in risky behaviors comes too late. They maintain that more benign approaches, particularly public education, would be far more effective.

There are also instances of medicalization being *imposed* on the medical profession, as illustrated by the legal mandate governing how physicians deal with child abuse. Physicians are required to

report suspected cases of child abuse when they examine children brought to their offices or, more likely, the emergency room. Medical treatment of the child is not at issue. However, some physicians resist reporting this form of deviance arguing that the children are likely to suffer further abuse when the abuser is threatened with legal sanctions and the removal of the child from the home.

Demedicalization

There is one well-known case of demedicalization—homosexuality. The first edition of the *Diagnostic and Statistical Manual of Mental Disorders (DSM)* published by the American Psychiatric Association (APA) in 1952, listed homosexuality as a “Sociopathic Personality Disorder.” It continued to be listed as a form of “sexual deviation” over the next two decades even as the challenge from homosexual activists, both within and outside the APA, gained momentum. In 1973, the APA Board of Trustees voted to adopt a new definition. As of that time, only those homosexuals who are disturbed by their condition are to be considered candidates for treatment. Many in the gay community welcomed the change. Others pointed out that there was no counterpart for the designation of “Homosexual-Conflict Disorder” for heterosexuals, as in “Heterosexual-Conflict Disorder.” Society has become more accepting of homosexuality and homosexual unions since the early 1970s. Whether the APA’s decision contributed to the shift in social attitudes is not clear.

New Forces Promoting Medicalization

Although the term *medicalization* is now less likely to be invoked, the process appears to be proceeding at an accelerating rate along two related paths. One is the treatment of conditions that research indicates will lead to illness in the future and that can be identified using objective indicators of physical status. The second revolves around the possibility of enhancing the performance of persons who are healthy.

Turning to the first path, medicine has been more aggressive in recent years in lowering the cutoff that separates what is a normal reading from what requires attention for a range of physical indicators such as hypertension, cholesterol level, and diabetes. Physicians often strongly recommend lifestyle

changes, primarily more exercise and changes in diet. Although this may be a form of medicalization, it is not one that provides the benefits long associated with the sick role. In fact, it requires a certain amount of sacrifice in giving up familiar patterns of behavior that are not considered deviant. Whether society comes to define self-indulgent eating habits and avoidance of exercise as deviant and requiring some form of intervention (e.g., increased regulation or taxation) besides physicians' admonitions remains to be seen. The shift in social attitudes toward drinking and driving provides a good example of society's power to redefine what is acceptable versus unacceptable behavior, without physicians taking the leading role.

Whether the health problems that result when patients will not or cannot make the behavioral changes that are intended to lower readings on their blood pressure, low density lipids, and blood sugar should be defined as syndromes is a matter of debate in the medical community. Obesity is a case in point. From the medical profession's perspective, defining what is and what is not a disease revolves around questions of ethics and a consensus regarding best practices, not issues of social deviance. To illustrate, the American Academy of Family Practice (AAFP) declared, in 2004, that obesity is a disease; the American Medical Association (AMA), however, maintains that it is clearly a major health problem but not a disease. Those who favor defining obesity as a disease say that this will cause it to be taken more seriously. Those who are opposed say that doing so will have the effect of diminishing personal and social responsibility.

Ethics and best practices are also at issue in how medicine should treat such touchy problems as gender allocation surgery at birth, gender-based selection of fetuses, treating women who have lost interest in sex with testosterone creams, and so on. There is no denying the fact that members of the public are demanding a wide range of interventions and that there are growing numbers of willing providers. To illustrate, according to the American Society for Aesthetic Plastic Surgery (ASAPS), 11.5 million cosmetic procedures were performed in the United States in 2005. This is a 444% increase from 1997 to 2005. There were 3.29 million Botox injections, making it the most popular procedure. By some estimates, this procedure has become a \$15 billion business.

Now that patients are increasingly directly involved in requesting treatment for what they perceive to be unwelcome and avoidable physical problems, direct-to-consumer advertising by pharmaceutical companies is a new force in convincing the public that their problems are actually syndromes that can be successfully treated with prescription drugs. Some physicians say that they feel pressured to prescribe medications when there is no evidence that a person is afflicted with the illness featured in the ads. Even when patients do experience some of the symptoms being described in the ads, physicians often maintain that waiting to see whether the symptoms diminish is preferable to reaching at once for pharmaceuticals.

The second newly evolving medicalization path revolves around the "heal or enhance" debate, which has been limited to revelations about athletes, until recently, but is increasingly affecting the general public. Some physicians take the position that anything that helps patients is within the legitimate scope of medical practice. Others argue that *restoring* function should not be confused with *enhancing* function. The worry is that it is becoming more and more difficult to draw the line between ethical and unethical practices. Is it ethical to prescribe stimulants that can help enhance grades? Is it ethical to prescribe Alzheimer's medications to enhance memory? Is "cosmetic neurology"—described by its main promoter as the modulation of "motor, cognitive, and affective systems"—an acceptable medical practice? The demand for such enhancements is clearly growing where competitive pressure is greatest—that is, in professional athletics and advanced educational training.

It is difficult to imagine what might replace the medicalization process that shifts badness to sickness, especially as it is increasingly accompanied by the promise of an unrestrained potential to redefine a wide range of human problems as medical problems, which people might then rid themselves of simply by taking a pill.

Grace Budrys

See also *Diagnostic and Statistical Manual of Mental Disorders (DSM)*; Direct-to-Consumer Advertising (DTCA); Disease; Health; International Classification of Diseases (ICD); Medical Sociology; Physicians; Public Health

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- American Society for Aesthetic Plastic Surgery (ASAPS): <http://www.surgery.org>
- National Institute of Drug Abuse (NIDA): <http://www.nida.nih.gov>

MEDICAL SOCIOLOGY

Medical sociology is a large, substantive area within the general field of sociology. Using a sociological perspective, theories, and research methods, medical sociology is concerned with the social causes and consequences of health and disease. Some of the major areas that medical sociology studies include (a) the social aspects of health and disease, particularly health and illness behavior and the role of the sick; (b) the social behavior of healthcare professionals and their patients, particularly physician–patient interaction; (c) the social functions of healthcare organizations

and institutions, particularly hospitals and health-care networks; (d) the social patterns of health services; and (e) the international comparisons of healthcare delivery systems, particularly comparing the healthcare system of the United States with that of Canada and the United Kingdom.

History

Although a number of medical sociology articles appeared in the late 19th and early 20th centuries, the field is generally regarded as beginning in 1951 with the publication of Talcott Parsons's book *The Social System*. In his book, Parsons (1902–1979), the influential American, Harvard University sociologist, presented a functionalist theory of the "sick" role. He argued that patients who (a) do not intentionally cause their own illness, (b) seek help from a physician, and (c) strive to get well are entitled to relief from their normal role responsibilities—a period of legitimated deviance. Those who do not follow these rules are engaging in deviant behavior and must be socially sanctioned. Otherwise, Parsons argued, society risks social instability. As for physicians, Parsons said that they bear heavy responsibility for insuring that patients do not take advantage of the sick role. Accordingly, they deserve a high level of social reward in the form of status and income.

Although Parsons's theory of the sick role has become a basic concept in medical sociology, other sociologists have strongly criticized it. They point out that the theory (a) fails to address the wide variations in the way people view sickness and define sick-role behavior; (b) does not take into consideration various types of diseases, such as chronic diseases and mental illness; (c) is based on a traditional, one-to-one interaction between a patient and a physician, which frequently does not occur; and (d) is based on a middle-class pattern of behavior that fails to consider the sick role of lower socioeconomic classes.

In the 1970s, medical sociology changed dramatically. Many medical sociologists suddenly reversed their position and embraced a *critical theoretical perspective*. They argued that physicians act in a *dominant* fashion in their interactions with patients and other healthcare workers. This assessment captured society's growing skepticism

regarding physicians' social position, but it did not have much practical impact on physicians.

That changed during the 1980s with the emergence of managed care. Managed-care spokespeople announced that they would not only eliminate the inefficiencies associated with nonprofit-organizational management but also protect patients from physicians who were primarily motivated by profit. The medical-sociological critique was no longer daring. A backlash against managed care did not come until the mid-1990s, and by that time social confidence in medicine, if not in one's own physician, had been badly damaged.

System Goals

In retrospect, the medical-sociological contribution to understanding healthcare delivery was most clearly identified with the discipline of sociology during the 1950s and 1960s when the work was primarily theoretical. It is clear that medical-sociological observations reflected concern about the quality of healthcare. The fact that medicine was delivered in private offices with little professional oversight meant that social control over quality was a basic social concern. During the 1970s, medical sociologists did the underlying work on access or the availability of healthcare. This body of work constitutes a major methodological contribution. By the 1980s, cost containment rose to the forefront pushing medical-sociological work aside in preference to medical economics.

Availability of Data and Interdisciplinary Research

The introduction of computers during the 1980s had a radical effect on medical sociology and other disciplines involved in health services research. Internet technology permitted the government to collect and report statistics in a timely manner and make them publicly available. This, combined with the fact that healthcare had become a central social concern, meant that an increasing number of institutions, as opposed to individuals, were interested in analyzing health statistics for the purpose of influencing policy. Organizations began employing researchers, who were expected to work as members of interdisciplinary teams and produce clearly written position papers free from

exclusive disciplinary jargon. Many medical sociologists now define themselves as health services researchers or population health researchers.

Current Status and Future Direction

Today, medical sociology is a mature, objective, and independent field of study and work. There are a large number of professional medical sociologists conducting research and teaching in many countries, including the United States, Canada, Australia, Germany, Japan, and the United Kingdom. Medical sociology is the third largest section in the American Sociology Association, and it is the largest section in the British and German sociological associations. Most college and university sociology departments in the United States offer introductory courses in medical sociology, and several universities have well-established doctoral degree programs in medical sociology. Through the decades, medical-sociology concepts and research methodologies grounded in mainstream sociology have become integrated into the larger health research enterprise. The reverse is also true: Medical sociology continues to expand but is doing so in recognition of advances outside the discipline.

Grace Budrys

See also Access, Models of; Anderson, Odin W.; Computers; Disease; Health; Healthcare Organization Theory; Health Surveys; Medicalization

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- Medical Sociology Section, American Sociological Association (ASA): <http://dept.kent.edu/sociology/asamedsoc>
- Medical Sociology Study Group, British Sociological Association (BSA): <http://www.britisoc.co.uk/medsoc>

MEDICAL TRAVEL

Medical travel refers to persons traveling outside their home region in pursuit of healthcare that is more accessible, of higher quality, or of lower cost. It is a narrower term than *medical tourism* (also *health tourism*), which refers to consumers seeking health services of all kinds outside their home region—including spa treatments and other wellness services—as well as the industries that cater to these consumers. The *medical tourism industry* includes care providers and also related services such as intermediaries, concierges, travel specialists, and providers of room and board for medical travelers. Medical travel is distinct from *travel medicine*, which refers to preventive medical care provided to consumers in preparation for their planned travel (e.g., vaccinations for diseases occurring in the destination area).

Reasons for Medical Travel

There are many reasons why patients travel for medical care; most can be categorized into three main areas: (1) access, (2) cost, and (3) quality. Patients travel for access reasons if they are seeking care that they cannot receive in their own community. Access may be subcategorized according to (a) patients who are seeking care that is not provided in their home region versus (b) patients who may be able to receive comparable care at home but not in a timely fashion, and so they are seeking more expeditious care elsewhere. Seeking care unavailable in one's own community is probably the oldest form of medical travel; stories of epic journeys to find a mystical healer or rare elixir are relatively common and date back many centuries. A more modern example can be found in the patients from the United States who have

traveled to India to receive hip-resurfacing treatments, because the treatment was viewed as superior to hip replacement surgery but the procedure was not yet approved in the United States. The other subcategory—more expeditious access—includes patients who live in countries with nationalized healthcare systems who may face months-long wait times for treatment at home and who can receive immediate care in other countries with the same or very similar procedures. (Seeking more expeditious care can be viewed as an unfair or selfish practice by others from the same community, who sometimes refer to the practice as *line jumping*.)

Patients also travel for care in pursuit of lower costs. Elective procedures—that is, those not covered by insurance plans (e.g., cosmetic surgery)—can involve significant out-of-pocket expenses, and so these procedures are an important driver of cost-based medical travel. The financial motivations for comparison shopping can be even more substantial for uninsured and underinsured patients who have the financial resources to pursue care outside their communities' safety nets. Such patients, particularly those in need of major medical procedures, have substantial financial incentive to seek out the most cost-efficient care they can find, given their comfort level with travel as well as the perceived competency and safety of the procedures and care providers. Hospitals in developing countries, which have much lower operating costs, can provide some procedures for 20% or less of the amount that providers in the United States would charge. This can save uninsured patients tens or even hundreds of thousands of dollars, enough to make medical travel options enticing for a substantial proportion of patients needing high-end care. Given the size of this cost differential, some insurers have also begun providing plans—for U.S. employers with workers in states bordering Mexico—that require medical travel for nonurgent care.

The final category, quality, may similarly be broken down into several subcategories. One such segment comprises wealthy individuals from developing countries where there are few or no modern healthcare systems. In addition to traveling to other countries for major procedures, such patients may also travel to receive a better standard of routine care. A second important segment is patients pursuing cutting-edge healthcare—in

particular, high-tech procedures that may only be available from a finite number of providers in the world and are perceived to be superior to the more readily available treatment options. Inbound medical travel to major academic medical centers in the United States typically falls in this latter category.

Because medical travelers often pay up front and in cash, most health systems regard these patients as a particularly desirable clientele. Some developing countries, in particular, have come to view medical travelers as an important foundation for other types of economic development. Patients who come to a country for care may tend to stay longer in that country than other kinds of tourists do and, as a result, spend additional money in the local economy. Like tourists of other types, once medical travelers have visited a country for the first time, they are also more likely to return. For these reasons, the governments of some countries have established organized efforts to attract these patients to their private healthcare systems.

Accreditation

Although access, cost, and quality all pose measurement challenges, the quality of healthcare is a particularly complex and difficult construct on which to compare care providers internationally. Different countries, and sometimes different regions within a country, often have very different approaches to quality assurance and credentialing, making meaningful comparisons across providers very difficult. Providers who want to attract an international patient base need to demonstrate quality via universally acceptable means, which has led to substantial interest in pursuing internationally recognizable accreditations. The most widely used hospital accreditation provider is Joint Commission International, an international program offered by the Joint Commission, based in the United States. Other providers, such as the International Organization for Standardization, also offer accreditation programs primarily for institutional, international, health services providers. Surgeons and other physicians can achieve similar accreditation status by maintaining board certification in countries in which their international patients either reside or feel confident.

Future Implications

The forecasts of future growth in medical travel vary considerably but, in general, predict that it will continue to expand at a pace exceeding the broader growth in medical services worldwide. As healthcare costs continue to escalate, as pressures for greater transparency in quality and cost facilitate performance comparisons, and as experiences with medical travel become more familiar, the range of and the opting for costly, nonurgent medical services on a global scale will grow. Further advances in technologies that support telemediated services will also facilitate the remote provision of precare and aftercare, which may also foster the expansion of medical travel options in the coming years.

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See also Access to Healthcare; Accreditation; Comparing Health Systems; Cost of Healthcare; International Health Systems; Joint Commission; Quality of Healthcare

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<http://www.iso.org>
 Joint Commission International (JCI):
<http://www.jointcommissioninternational.org>
 Pan-American Health Organization (PAHO):
<http://www.paho.org>
 Travel Industry Association (TIA):
<http://www.tia.org>
 U.S. Office of Trade and Tourism Industries (OTTI):
<http://tinet.ita.doc.gov>
 World Health Organization (WHO): <http://www.who.int>

MEDICARE

Medicare is a health insurance program for (a) people aged 65 or older, (b) people under age 65 with certain disabilities, and (c) people at any age with end-stage renal disease (ESRD). It is the nation's largest health insurance program, covering nearly 44 million Americans. The Medicare program is administered by the Centers for Medicare and Medicaid Services (CMS), and beneficiaries may apply for Medicare benefits 3 months before they reach 65 years of age. Almost 9 million individuals, or approximately 20% of Medicare beneficiaries, receive their care through the Medicare Advantage program, and more than 90% of beneficiaries receive prescription drug coverage of some type. Medicare spending is a large component of the federal budget and national health spending: In 2006, Medicare benefit payments totaled \$374 billion and accounted for 12% of the federal budget. The spending on Medicare benefits is about 20% of the nation's total healthcare expenditures.

History

President Lyndon B. Johnson signed the Medicare program into law in 1965 as Title XVIII of the Social Security Act. The Medicare program was originally designed to provide health insurance to the aged.

Prior to its enactment, there were several key moments in history that led up to the Medicare legislation. In 1935, the first federal government health insurance bill was introduced in the U.S. Congress. Later, in 1945, President Harry S. Truman became the first sitting president to officially endorse the idea of national health insurance. In 1961, President John F. Kennedy recommended to the U.S. Congress a health insurance program for the elderly under Social Security, and in 1965 President Lyndon B. Johnson signed Medicare into law.

Throughout the history of Medicare, there have been several major reforms to the program. When first implemented in 1966, Medicare primarily covered persons over the age of 65. In 1973, Medicare eligibility was extended to people with disabilities and those with ESRD. In 1976, health maintenance organizations (HMOs) began to be offered as a Medicare option. In 1983, the Medicare program began reimbursing hospitals based on a prospective payment system. In 1997, the Medicare+Choice program was enacted and is known today as Medicare Part C or the Medicare Advantage plans. In 2003, President George W. Bush signed the Medicare Modernization Act (MMA) into law, establishing a voluntary, outpatient prescription drug benefit program—known as Medicare Part D—that became available to Medicare beneficiaries in 2006. Under this law, Medicare Advantage was also established, allowing private insurance companies to offer choices in coverage to Medicare beneficiaries.

Medicare's Parts

Medicare consists of four parts: A, B, C, and D. The original Medicare plan included Medicare Part A (hospital) and Part B (medical). Medicare Part C is also called the Medicare Advantage plans (HMOs and preferred provider organizations [PPOs]). Medicare Part D is for prescription drug coverage. Medicare Parts B, C, and D are optional. Most individuals either have Parts A and

B, Part D and a Medigap (Medicare Supplemental Insurance) policy, or Part C (which combines Parts A and B) and Part D.

Eligible individuals do not have to be retired to get Medicare. Unlike Social Security, working people can still receive full Medicare benefits at age 65. People who are already receiving Social Security benefits are automatically enrolled in Medicare without an additional application.

Medicare Part A

Most people do not pay for Medicare Part A because they contributed to the Medicare Trust Fund for 40 quarters. Medicare Part A is largely financed through hospital insurance taxes; it provides basic protection against the costs of inpatient hospital and other institutional-provider care. Officially, this program is called the Hospital Insurance Benefits for the Aged and Disabled, although it includes much more than just hospital benefits. Medicare Part A not only helps pay for inpatient hospital stays, but it also covers skilled nursing care, home health care, and hospice care. Unofficially, this program is sometimes called basic Medicare or hospital insurance because the authorization for the program is Part A of Title XVIII of the Social Security Act.

Whereas most people do not pay a premium for Medicare Part A, they are responsible for a deductible for inpatient hospital stays. The deductible is the amount a person with Medicare must pay for healthcare before Medicare begins to pay. There was a deductible of \$1,024 in 2008 for hospital stays of up to 60 days, and additional costs for longer stays. The costs are different for other Medicare Part A services. Skilled-nursing facility coinsurance, for example, is \$128 per day for days 21 through 100 for each benefit period.

Medicare Part B

Medicare Part B is a voluntary program that covers the costs of physician and other healthcare practitioner services, items, and supplies not covered under the basic program. It is financed through monthly premiums from enrollees and contributions from the federal government.

This program is more formally known as the Supplementary Medical Insurance Benefits for the

Aged and Disabled, but it is often also called supplementary Medicare or the medical insurance program. Medicare Part B is medical insurance that helps cover physicians' services and outpatient care such as preventive services, including screening tests and vaccinations, diagnostic tests, some therapies, and durable medical equipment, such as wheelchairs and walkers.

In addition to the monthly premium for Medicare Part B, there is also a deductible; in 2008, this was \$135. This means that in 2008, a person with Medicare was responsible for the first \$135 of his or her Medicare approved Part B medical services before Medicare Part B started paying for care. The deductible amount can change each year. People with the original Medicare plan also are responsible for some copayments or coinsurance for Medicare Part B services. The amount depends on the service but is 20% in most cases.

Medicare Part C

A third Medicare program, Medicare Part C, expands managed-care options for beneficiaries who are entitled to Part A and are enrolled in Part B. Medicare Part C was created under the Balanced Budget Act of 1997 and is also called Medicare Advantage. This program was formerly known as Medicare+Choice. Since January 1, 1999, beneficiaries have had the option of choosing to receive their health benefits through the traditional Medicare fee-for-service program or to select a managed-care plan certified under Medicare Advantage. The payments Medicare makes to a Medicare Advantage plan replace the amount that Medicare would otherwise have paid under Parts A and B.

There are several types of Medicare Advantage plans. A Medicare Advantage organization (MAO) is a public or privately owned entity organized and licensed by a state as a risk-bearing entity (with the exception of provider-sponsored organizations receiving waivers) and is certified by the CMS as meeting the Medicare Advantage contract requirements. A Medicare Advantage plan has health benefits coverage—offered by an MAO under a policy or contract—that includes a specific set of health benefits offered at a uniform premium and uniform level of cost sharing to all Medicare beneficiaries residing in the service area (or segment of

the service area) of the plan. A Medicare Advantage plan may also provide a prescription drug benefit. In 2008, 9.7 million beneficiaries were enrolled in Medicare Advantage plans with the majority (70%) in HMO plans.

Medicare Part D

Most recently, the Medicare program was expanded by the MMA of 2003 to include a prescription drug benefit under a new Medicare Part D of the Social Security Act. Beneficiaries entitled to Part A and enrolled in Part B, enrollees in Medicare Advantage and private fee-for-service plans, and enrollees in Medicare Savings Account Plans are all eligible for the prescription drug benefit. The prescription drug benefit became available to eligible individuals on January 1, 2006.

Premiums and Enrollment

Most people do not have to pay a monthly charge (premium) for Medicare Part A because they or their spouse paid Medicare or Federal Insurance Contributions Act (FICA) taxes while they were working. This is the tax withheld from a person's salary, or that an individual pays from their self-employment income, that funds the Social Security and Medicare programs. When people pay these taxes on their earnings, it is called Medicare-covered employment. If a person and his or her spouse did not pay Medicare taxes while they were working or did not work long enough (usually 10 years or 40 quarters in most cases) to qualify for premium-free Part A, he or she may still be able to get Medicare Part A by paying a monthly premium. In 2008, the Part A premium was \$233 for people having 30 to 39 quarters of Medicare-covered employment, or \$423 for those who are not otherwise eligible for premium-free hospital insurance and have fewer than 30 quarters of Medicare-covered employment.

Qualifying beneficiaries can choose whether or not to enroll in Medicare Part B medical insurance. Those who enroll are responsible for a monthly premium for Medicare Part B, which was \$96.40 in 2008. Starting January 1, 2007, some people with higher annual incomes—more than \$80,000 if filing an individual federal income tax return or more than \$160,000 if married, filing jointly—pay

a higher Medicare Part B premium. These amounts change each year. The majority of beneficiaries pay only the standard Medicare Part B premium.

People can sign up for Medicare Part B at any time during a 7-month period that begins 3 months before the month they become eligible for Medicare. This is called the initial enrollment period (IEP). People who do not take Medicare Part B when they are first eligible may have to wait to sign up during a general enrollment period (GEP). This period runs from January 1 through March 31 of each year, with coverage effective July 1 of that year. Most people who do not take Medicare Part B when they are first eligible will also have to pay a premium penalty of 10% for each full 12-month period they could have had Medicare Part B but did not sign up for it, except in certain situations. In most cases, individuals will have to pay this penalty for as long as they have Medicare Part B.

Most people covered by a group health plan based on current employment (their own or their spouse's) can delay enrolling in Medicare Part B without a penalty. These individuals get a special enrollment period. They can enroll in Medicare Part B at anytime while they are still covered by their employer or union group health plan based on current employment, or during the 8 months following the month the employment ends or the group health plan coverage ends, whichever is first. Most people who sign up for Medicare Part B during a special enrollment period do not pay higher premiums.

People who choose Medicare Part B usually have the premium automatically taken out of their monthly Social Security or Railroad Retirement payment. Federal government retirees may be able to have the premium deducted from their retirement check.

People can choose to get Medicare healthcare coverage in several ways. Which Medicare plan people choose may affect their costs, benefits, and convenience, and their physician, hospital, and pharmacy choices. Nonetheless, no matter how people choose to get their Medicare healthcare, they are still enrolled in the Medicare program.

The original Medicare plan is available nationwide; it is also known as "fee-for-service." People in the original Medicare plan may go to any physician, specialist, hospital, or other healthcare provider who accepts Medicare. However, there are

other plans besides the original Medicare plan that people can choose to get their Medicare health coverage.

Medigap Insurance

A Medigap policy is a health insurance policy sold by private insurance companies to fill the “gaps” in coverage under the original Medicare plan, including the deductibles, coinsurance, and copayments mentioned above. Some Medigap policies also provide benefits that Medicare does not include such as emergency healthcare when traveling outside the United States. The insurance companies that sell these policies must follow federal and state laws that protect people with Medicare. The Medigap policy must be clearly identified as Medicare Supplement Insurance.

A Medigap policy only works with the original Medicare plan. If an individual joins a Medicare Advantage plan or other Medicare plan, then the Medigap policy cannot pay any deductibles, copayments, or other cost sharing under the Medicare plan. In all states except Massachusetts, Minnesota, and Wisconsin, a Medigap policy must be one of 12 standardized plans (A–L) so that people can compare them easily. Each plan has a different set of benefits. The benefits in any Medigap plan A to L are the same for any insurance company. It is important for individuals to compare Medigap policies because the costs vary.

In most Medicare Advantage plans, members usually get all their Medicare-covered healthcare through that plan. The plan may offer extra benefits such as Medicare prescription drug coverage as well as coverage for vision, hearing, dental, or health and wellness programs. If a plan offers a network of healthcare providers and hospitals, people may very often have to use only that panel of providers. However, it is important to note that people who join a Medicare Advantage plan are still in the Medicare program and still receive all their regular Part A and Part B services. Additionally, beneficiaries in a Medicare Advantage plan still have Medicare rights and protections.

Medicare Prescription Drug Benefits

All people with Medicare now have the option to join a plan that covers prescription drugs. Anyone

who has Medicare Part A, or Part B, or both Part A and Part B is eligible to join a Medicare drug plan and must enroll in a plan to get Medicare prescription drug coverage. However, people who live outside the United States or who are incarcerated may not enroll and are not eligible for coverage. The CMS contract with private companies offering Medicare prescription drug plans to negotiate discounted prices on behalf of their enrollees. People may also receive Medicare drug coverage through a Medicare Advantage plan or other Medicare plan, if they are enrolled in one. Some employers and unions may provide Medicare prescription drug coverage through employer/union group plans to their retirees. The drug benefit is offered through stand-alone prescription drug plans (PDPs) and Medicare Advantage prescription drug (MA-PD) plans, such as HMOs that cover all Medicare benefits, including drugs.

Generally, there are two types of enrollment periods when people can sign up for Medicare prescription drug coverage: (1) the IEP is for 7 months starting 3 months before the month they become entitled to Medicare; (2) the annual coordinated election period is from November 15 to December 31 each year. During this period, a person who is not enrolled in a Medicare drug plan can choose to enroll.

People who do not enroll when they are first eligible may have to pay a penalty to enroll later. Most people who wait until after the end of their IEP to join a Medicare drug plan will have their premiums go up 1% of the national base premium for every month they waited to enroll. These individuals will usually have to pay this penalty as long as they have Medicare prescription drug coverage.

The costs of prescription drug benefits vary depending on the plan. Plans must provide a standard level of coverage, but they may offer more coverage or additional drugs, usually at a higher monthly premium. In most cases, for coverage in 2008, people paid a monthly premium that varied for different plans, a deductible, and a copayment or coinsurance. Once a Medicare beneficiary spent \$4,050 out of pocket for covered drug costs during 2008, they paid 5% of their drug costs for the rest of the calendar year. This is called *catastrophic coverage*, and it could take effect even sooner in some plans. All these amounts can change each year.

Medicare Part D plans vary in benefit design, covered drugs, and utilization management tools, such as prior authorization, quantity limits, and step therapy. The CMS established minimum requirements for Medicare Part D plan formularies to help ensure that plans do not offer formularies that discriminate against or discourage the enrollment of certain types of beneficiaries. Enrollment in Medicare drug plans is voluntary, with the exception of dual-eligible (people in both Medicare and Medicaid) and certain low-income beneficiaries who are automatically enrolled in a prescription drug plan if they do not choose a plan on their own.

Many people with limited income and resources will get extra help paying for prescription drugs. The extra help is available to people with Medicare who have an income below 150% of the federal poverty level and limited resources. Resources also are counted for the person and a spouse, if living together. The resource limits in 2007 were \$11,710 for an individual and \$23,410 for a married couple.

Future Implications

The Medicare program continues to fulfill the vision of President Johnson's Great Society by furnishing healthcare services for the elderly as well as for persons with disabilities and ESRD. The program serves tens of millions of Americans each year by providing essential healthcare coverage. However, there is growing concern over Medicare's rising costs and questions about the ability of the program to sustain itself over time. The public policy debate concerning the direction and solvency of the nation's Medicare program will be an increasingly important topic of discussion in the future.

Raymond J. Swisher

See also Centers for Medicare and Medicaid Services (CMS); Health Insurance; Managed Care; Medicaid; Medicare Part D Prescription Drug Benefit; Medicare Payment Advisory Commission (MedPAC)

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- My Medicare Matters, National Council on Aging: <http://www.mymedicarematters.org>
- Robert Wood Johnson Foundation (RWJF): <http://www.rwjf.org>

MEDICARE PART D PRESCRIPTION DRUG BENEFIT

On December 8, 2003, President George W. Bush signed into law the Medicare Prescription Drug, Improvement, and Modernization Act of 2003, or MMA. This legislation was the most significant expansion of the nation's Medicare program since its inception in 1965. The MMA provides seniors and individuals with disabilities with voluntary prescription drug coverage, referred to as Medicare

Part D. The new coverage began on January 1, 2006. Until the MMA, Medicare did not provide coverage for outpatient prescription drugs.

The Medicare prescription drug benefit is voluntary insurance that covers both brand name and generic prescription drugs at participating pharmacies. All Medicare beneficiaries are eligible for this coverage, regardless of income level and financial resources, health status, or current prescription expenses. Individuals enrolled in Medicare Part A (hospital insurance), Medicare Part B (medical insurance), or both Part A and Part B are eligible for Medicare Part D. To obtain prescription drug coverage, a Medicare beneficiary must enroll in a Medicare prescription drug plan.

The Centers for Medicare and Medicaid Services (CMS), the U.S. federal agency that administers the Medicare program, contract with private companies offering Medicare prescription drug plans and negotiate discounted prices on behalf of Medicare beneficiaries. Individuals may also receive Medicare drug coverage through Medicare Advantage plans or another Medicare plan, if they are enrolled in one. Some employers and unions may also provide Medicare prescription drug coverage to their retirees through employer/union group plans.

Enrollment

Generally, there are three periods of time when individuals can sign up for Medicare prescription drug coverage. The IEP is 7 months long, starting 3 months before the month of becoming entitled to Medicare. Second, there is an annual coordinated election period from November 15 through December 31 each year. During the annual coordinated election period, individuals who are not enrolled in a Medicare drug plan may enroll, and individuals who are already in a Medicare drug plan may drop or switch plans. The change will be effective from January 1 of the following year. Third, there are special situations that entitle individuals to a special enrollment period, such as an involuntary loss of *creditable prescription drug coverage* or a change of permanent residence out of the plan's service area.

In most cases, if an individual does not join a plan during the IEP, his or her premium will increase 1% of the national base premium for every full month he or she waits to enroll.

(The national base premium was \$27.35, for 2007). The individual will have to pay this penalty, in addition to the premium, for as long as he or she has Medicare prescription drug coverage. Moreover, one may have to wait until the next annual coordinated election period, November 15 to December 31, to enroll. The enrollment will be effective from January 1 of the following year. However, if a person has other drug coverage that is at least as good as the Medicare prescription drug coverage, called *creditable prescription drug coverage*, the penalty will not apply.

Coverage and Costs

Medicare drug plans are not all the same. Plans vary based on costs, which drugs are covered, and which pharmacies are in the network. Like other insurance, if an individual joins a Medicare drug plan, in most cases he or she will pay monthly premiums, which vary by plan, and a yearly deductible. They will also pay a part of the costs of the prescriptions, including a copayment or coinsurance. Costs will vary depending on the specific Medicare drug plan. Some plans offer more coverage and additional drugs for a higher monthly premium.

There may be a point during the year when a Medicare beneficiary will be paying 100% coinsurance, called the *coverage gap*. However, there are some Medicare drug plans that do not have a coverage gap or that pay for some drugs during the gap. Once the total out-of-pocket costs paid by a beneficiary reach a set amount (\$3,850, in 2007), the plan will pay all but 5% or a small copayment for the rest of the year. This is called *catastrophic coverage*. All plans must offer this catastrophic coverage. The CMS sets the standard premium, deductible, and copayment amounts every year. These are minimum requirements for drug plans offering basic coverage.

As already noted, all individuals with Medicare can get prescription drug coverage. This is true regardless of their income level and financial resources, health status, or how much they pay for prescriptions. Moreover, many individuals with limited income and resources will get extra help paying for their prescription drugs. Individuals with the lowest incomes will pay no premiums or deductibles and only have a small or no copayments. And individuals with slightly higher incomes

will have a reduced deductible and pay a little more out-of-pocket (15%) coinsurance.

Covered Drugs and Participating Pharmacies

Medicare Part D–covered drugs are defined as (a) drugs available only by prescription, used and sold in the United States, and used for a medically accepted indication; (b) biological products; (c) insulin; and (d) vaccines. The definition also includes medical supplies associated with the injection of insulin (i.e., syringes, needles, alcohol swabs, and gauze). Certain drugs or classes of drugs, or their medical uses, are excluded by law from Medicare Part D coverage.

Not all Medicare Part D–covered drugs are included by each drug plan. Each plan has a *formulary* or list of covered drugs. Plans' formularies must include a range of drugs to ensure that individuals with different medical conditions can get the treatment they need. A plan's formulary may not include every drug that a beneficiary takes. However, in most cases, a similar drug that is safe and effective will be available.

Medicare requires plans to have convenient pharmacies for individuals to choose from. Each company offering a Medicare drug plan will have a directory of pharmacies that work with the plan. Generally, a beneficiary must use one of the pharmacies listed in this directory for the plan to cover their prescriptions. However, some plans will allow individuals to use a pharmacy that is not in the plan's network for a higher cost. Plans cannot require the use of mail-order pharmacies, but they may offer them as an option, many times at a reduced cost to the beneficiary.

Future Implications

The CMS estimate that 39 million individuals—more than 90% of all Medicare beneficiaries—have prescription drug coverage. Of these individuals, approximately 24 million have coverage through the Medicare Part D program. As the population ages and more individuals join the Medicare program, Medicare Part D prescription drug coverage will become an increasingly important part of the nation's healthcare delivery system.

Todd Stankewicz

See also Centers for Medicare and Medicaid Services (CMS); Cost of Healthcare; Health Insurance; Medicare; Pharmaceutical Industry; Pharmacoeconomics; Prescription and Generic Drug Use

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- Pharmaceutical Research and Manufacturers of America (PhRMA): <http://www.phrma.org>

MEDICARE PAYMENT ADVISORY COMMISSION (MEDPAC)

The Medicare Payment Advisory Commission (MedPAC) is a small, independent, federal agency that advises the U.S. Congress on issues affecting the Medicare program. Established by the Balanced Budget Act of 1997, the commission monitors the Medicare program, reviews its policies, conducts studies, and makes recommendations to Congress. MedPAC combines the functions of two prior government agencies: the Prospective Payment Assessment Commission (ProPAC) and the Physician Payment Review Commission (PPRC).

Commissioners and Staff Members

MedPAC is composed of 17 commissioners and approximately 35 professional staff members. The commissioners, who are appointed by the U.S. Comptroller General and the head of the U.S. General Accountability Office (GAO), serve 3-year terms (subject to renewal) on a part-time basis. Appointments are staggered to maintain continuity: Every year approximately five or six commissioners end their appointments and new commissioners are appointed. The commissioners come from various geographic regions, and they bring a wide array of experience and expertise. Currently, the commissioners include actuaries, lawyers, physicians, and policymakers.

The commission's professional staff members include an executive director as well as various policy analysts, research assistants, administrative staff, and consultants. Its staff members prepare analyses of proposed regulations, write issue briefs, and contribute to the preparation of congressional testimony. Furthermore, they provide technical support to the staffs of congressional committees through memos and briefings.

Purpose

The commission's statutory mandate is quite broad. In addition to advising the U.S. Congress on payments to private health plans participating in the Medicare program and to providers in Medicare's traditional fee-for-service program, the commission also analyzes access to care, quality of care, and other issues affecting Medicare.

Public Meetings

The commission holds seven formal public meetings per year in Washington, D.C. At these meetings, the commission's professional staff members present their research and research regarding policy issues for the commissioners to discuss, and the commission's reports and specific recommendations to the U.S. Congress are approved. Time for public comment is always provided. Each meeting's agenda and briefs, as well as the transcripts from the meetings, are posted on the commission's Web site.

Commissioners and professional staff members also seek input on Medicare issues through informal meetings with individuals interested in the program,

including staff members from various congressional committees and the Centers for Medicare and Medicaid Services (CMS), healthcare researchers, medical providers, various beneficiary advocates, and professional associations.

Publications

MedPAC publishes a variety of documents, including reports, data books, congressional testimony, contractor reports, comment letters, Medicare basics, and payment basics. Its specific recommendations to the U.S. Congress and supporting analyses are published in two annual reports, which are issued in March and June of each year. These have included consideration of Medicare payment policy and promoting greater efficiency in Medicare. At the request of Congress, the commission also publishes reports on a variety of other Medicare-related subjects.

The commission publishes a yearly data book that provides statistical information on a variety of Medicare topics (e.g., national healthcare and Medicare spending, Medicare beneficiary demographics, and dual-eligible beneficiaries). It is frequently called on to testify before Congress and to submit reports on various Medicare issues. MedPAC publishes various reports that have been produced under contract for them by outside authors. The commission often submits formal comments on proposed regulations issued by the Secretary of the Department of Health and Human Services (HHS) and on various Medicare-related reports to Congress. It also publishes Medicare Basics for the public (e.g., Medicare benefit design, Medicare Advantage benchmarks, and payment compared with the average Medicare fee-for-service spending) and Medicare Payment Basics (e.g., ambulatory surgical centers payment system and clinical laboratory services payment system), both of which provide brief overviews of various Medicare topics.

All its publications are available on the commission's Web site.

Future Implications

MedPAC is in a unique position to influence policy making for the nation's Medicare program. In the past few years, the commission's recommendations have had substantial impact, and the U.S.

Congress feels obligated to weigh its recommendations carefully. The commission's reports and testimony make important contributions to federal legislation. In the future, with the growing number of elderly people and the rising costs of Medicare, the commission's recommendations will continue to be highly valued.

Vikrant Vats

See also Centers for Medicare and Medicaid Services (CMS); Health Insurance; Medicare; Payment Mechanisms; Public Policy; Regulation; U.S. Government Accountability Office (GAO)

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MENTAL HEALTH

More than 50 years ago, the World Health Organization (WHO) defined mental health as a

complete state of mental and physical well-being, and not simply the absence of disease. This definition emphasizes the positive features of mental well-being. Good mental health is associated with positive family, community, and school or work involvement, as well as with a supportive group of friends.

In contrast, mental illness usually is associated with the absence of one or more of these positive involvements. Mental illness can be characterized by problems in one's thinking, emotions, behaviors, or any combination of these three. The American Psychiatric Association (APA) has developed a classification system for mental disorders based on these characteristics, published as the *Diagnostic and Statistical Manual of Mental Disorders (DSM)*.

The most common mental disorders among adults in the United States are depression and anxiety, each of which affects about 10% of the population. Much less common are bipolar disorder—a combination of depression and mania, which affects about 4% of adults—and schizophrenia, which affects about 1% of the adult population. Both can lead to disabilities, and both bipolar disorder and schizophrenia are known to have a genetic basis, at least in some population groups.

About 25% of adults have a mental disorder within a 1-year period, and about 50% will have a mental disorder in their lifetime. About 6% of adults become seriously disabled as a result of mental illness. Less is known about the rates of specific mental illnesses in children and adolescents. However, about 20% of youths suffer from one or more disorders, and 9% to 13% of them are seriously disabled. Soon, national data will be available on the rates of specific disorders in this population.

Historical Overview

Because mental illness has not been well understood in the past, the history of mental illness and care is characterized by misunderstanding and exclusion. These can lead to stigmatization, by which a person or a family is blamed for the mental illness and deliberately excluded from social groups, community activities, and work. Only recently has mental illness been truly recognized as a treatable illness from which one can recover.

In the American colonial period, people who had mental illness were called “the insane” and were cared for by their families or in local almshouses. Around the time of the American Revolution, a system of state mental hospitals was constructed. The first of these facilities, Eastern State Hospital, was built near Williamsburg, Virginia, shortly before the Revolution. Usually, these facilities were located in rural areas because it was thought that persons with mental illness would benefit from good air and the quiet atmosphere of a rural setting.

After World War I, it became clear that a large number of potential recruits had been excluded from military service because of mental illness. It also became clear that battle fatigue, suffered by soldiers who had experienced combat, was a form of mental illness. As a result, in the early 1930s, the Veterans Administration created a system of general hospitals that also provided psychiatric care. In the early 1940s, a system of general hospitals in local communities was created, many of which offered psychiatric care, and in the 1950s, a large number of private psychiatric hospitals were founded, principally in urban areas.

In 1949, President Harry S. Truman signed legislation creating the National Institute of Mental Health (NIMH). In 1954, the drug chlorpromazine (sold under the trade names of Largactil and Thorazine) was approved in the United States for psychiatric treatment. It was hailed as a wonder drug to treat severe mental illness. With the advent of drug therapy, the nation’s state mental hospitals began to empty, a process later called *deinstitutionalization*. However, many of the former inpatients of the mental hospitals became homeless, were placed in nursing homes, or were even incarcerated in jails or prisons.

In 1963, President John F. Kennedy signed federal legislation creating a national system of community mental health centers, which would be available throughout the nation. It was estimated that 1,500 of these facilities would be required to serve the entire American population. More than 800 facilities were built before President Ronald Reagan ended federal funding for the program in 1981.

From 1980 to the end of the 20th century, the mental healthcare field strove to provide effective care in local communities for public clients who

had mental illnesses that led to serious disabilities. Although effective programs were developed for both adults and youths, these programs were not broadly implemented. In 1992, President George H. W. Bush signed federal legislation creating the Substance Abuse and Mental Health Services Administration (SAMHSA) with the mission of improving both mental health and substance use care throughout the nation.

With the dawning of the 21st century, a new awareness has developed that effective care is available, that one can recover from mental illness, and that one who has had a mental illness can lead a happy and productive life in the community. This new approach has been heralded by representatives of the mental healthcare community and broadly embraced by many Americans.

Many successes in mental health have been achieved, in large measure due to the development and growth of an effective mental health consumer movement in parallel with the rapid growth of the family movement. Many American communities have access to (a) an affiliate of Mental Health America, representing consumers; (b) an affiliate of the National Alliance for Mental Illness, representing both families and consumers; and (c) the Federation of Families for Children’s Mental Health, representing both families and children.

Recent Reports

Several recent reports will likely have a major effect on the future of mental healthcare in the United States.

More than 200 years after the first U.S. Surgeon General took office in 1798, the first-ever *Mental Health: A Report of the Surgeon General* was issued in 1999. This report examined the scientific foundation for current mental illness care practices and identified opportunities for care improvement. Significantly, the scientific foundations of mental health clinical and services research was found to be quite robust. The report identified the integration of mental health with general healthcare as the step forward needed most in the near term, with the goal that the two systems become one and treat both mind and body at the same time.

In 2002, slightly more than 25 years after President Jimmy Carter convened the first President’s Commission on Mental Health,

President George W. Bush convened the President's New Freedom Commission on Mental Health. The new commission met for a year and then issued a report titled *Achieving the Promise: Transforming Mental Health Care in America* in 2003. The report identified six major goals for the improvement of mental healthcare in America: (1) Americans understand that mental health is essential to overall health; (2) mental healthcare is consumer and family driven; (3) disparities in mental health services are eliminated; (4) early mental health screening, assessment, and referral to services are common practice; (5) excellent mental healthcare is delivered and research is accelerated; and (6) technology is used to access mental healthcare and information.

In 2005, the prestigious national Institute of Medicine (IOM) issued a study titled *Improving the Quality of Health Care for Mental and Substance Use Conditions*. This landmark study provided a plan for achieving the goals outlined by the President's New Freedom Commission on Mental Health. A new set of "care rules" was identified to improve care quality. These rules promoted (a) better provider-consumer information exchange, (b) more stable care relationships, and (c) a more central role for consumer input regarding care. Care quality was determined to relate to six factors: (1) safety, (2) efficiency, (3) effectiveness, (4) equitability, (5) timeliness, and (6) person-centeredness. (For the latter, IOM identified the consumer's input as the "true north" of the healthcare system.) Finally, four key strategies were recommended to bring about necessary system changes: (1) financing reform, (2) training of providers, (3) implementation of care that has a sound scientific basis, and (4) better use of information technology and performance measures. As with each of the earlier reports, it was strongly recommended that the integration of mental health and general healthcare be a high priority.

Who Receives Care?

At least half of those who experience a mental disorder each year do not receive any care at all. Among the 10% to 12% of the American population who do receive mental healthcare, about half (5–6%) actually see a mental health specialist. These specialists include psychiatrists,

psychologists, social workers, psychiatric nurses, marriage or family therapists, and clinical mental health counselors. Typically, these providers see clients either in the practitioner's office or in an outpatient clinic or community mental health center.

The remaining 5% to 6% of the American population who receive care for mental illness are seen only by a general, medical physician. This pattern is particularly pronounced for children, who likely are seen only by their pediatricians, and for elderly persons, who likely are seen only by their personal physicians. Most primary-care physicians are not adequately trained to recognize and treat the full spectrum of mental illnesses.

About one fourth of those who experience a mental disorder each year suffer from a serious mental illness such as schizophrenia and suffer the greatest consequences in their loss of community participation. Many of these people are homeless and jobless because of their illnesses. Frequently, they receive their only mental healthcare through a state mental health agency, sometimes in a state mental hospital or local, outpatient, mental health clinic.

Each year, many other Americans have a range of mental health problems with symptoms that are not severe enough to qualify as mental illnesses. Only a very small percentage of this group seeks or receives care. Often, when care is sought, the first point of contact is a company employee assistance program, many of which offer both mental health and substance use care services, or a school or college health service.

If so many youths and adults have mental illnesses, why do so few receive care? In a word, stigma, which can lead to the rejection of care for fear that other family members, neighbors, fellow employees, and friends will find out. Many people interpret seeking care as a sign of weakness and fear that it will have negative effects in the future, such as diminished job prospects or the loss of friends. Stigma can also manifest through negative managerial, boardroom, and legislative decisions about funding for mental healthcare. It is well-known, for example, that insurance benefits for mental illnesses provide less annual and lifetime coverage than for physical disorders. This differential has spawned major efforts by national mental health leaders to seek parity for mental health benefits in both

private and public insurance plans. In its most extreme forms, stigma manifests as discrimination against people with mental illness.

Some progress has been made in addressing the stigma of mental illness. Depression, anxiety, and even schizophrenia show up on some television shows as part of a character's story line. Well-known national figures have disclosed their own illnesses: Tipper Gore, the wife of the former vice president Al Gore, and Mike Wallace, a longtime anchor on the popular investigative television newsmagazine show *60 Minutes*, both have discussed their bouts with depression. And the popular author Danielle Steel has written a gripping account of the bipolar disorder suffered by her eldest son. National organizations have also mobilized to combat stigma. As a result, the stigma associated with mental illness has diminished, but it has not yet been extinguished.

Recent Improvements in Care

In the past quarter century, there have been changes in the way Americans view mental health and the way mental illness is treated. Many of these changes are positive steps, though others have introduced new societal problems. The main changes are discussed briefly below.

Care Has Moved From Institutions to the Community

There are about 250,000 fewer psychiatric beds today compared with 25 years ago. Community-based care has expanded dramatically. Yet many persons have been left behind. Witness the dramatic growth in mental illness among the homeless as well as among the less affluent segments of American society.

Care Is Better Integrated Into Overall Support Systems

It is now widely understood that those with the most severe mental illnesses require care systems that span mental health, overall health, rehabilitation, and social support services in the community. At the heart of such systems are case managers who work to achieve better community integration for their clients. Yet many of these systems lack

essential components, particularly in the most rural areas and the poorest urban areas.

Care Includes a Broad Range of Modern, Psychotropic Medications

Medications are now available for virtually all the major mental illnesses. Yet many people do not receive modern medications because they lack the financial resources to pay for them. Even when more effective, modern formulations are available, older medications—some developed as long ago as 50 years—are used because they cost less. Some newer medications have also given rise to concerns about secondary effects, particularly metabolic changes that can lead to diabetes and heart disease.

Care Has Become More Consumer and Family Centered

A quarter century ago, mental healthcare providers made virtually all the decisions about the nature of mental healthcare and its duration. Now, consumers and family members help define the objectives and the content of care. Yet a chasm frequently exists—between the provider and consumer perspectives and between the consumer and family perspectives—that can diminish the effectiveness of care.

Debate Over Forced Treatment Continues

In the past, this debate focused on inpatient commitment. Now, it focuses on outpatient commitment in community settings. Some community members and professionals favor outpatient commitment or court-determined and directed outpatient care if clients do not follow recommended treatment practices. Many consumers oppose it as an infringement on personal rights. This debate has fostered the development of creative alternatives. For example, *advance directives* are similar to a living will in that a person makes his or her wishes known in advance and appoints a personal representative to reflect these views of patient care in subsequent proceedings. It may be useful to view forced outpatient commitment as a measure of system failure in that it generally occurs only when prior care has not been adequate.

Disparities in Mental Healthcare Have Been Identified

It has been known for decades that racial, ethnic, gender, and age disparities exist in the occurrence of mental illnesses and in mental healthcare services. Yet it is only recently that these disparities have been recognized as national policy concerns. As a result, mental health providers and systems will need to learn to adapt themselves to a broader diversity of clients and develop a heightened level of sensitivity to cultural and biological differences.

Integration of Mental and Physical Healthcare Services Has Begun

Until as recently as a decade ago, mental healthcare and physical healthcare systems operated in separate, parallel worlds. With approximately 5% to 6% of the American population receiving mental healthcare only from general physicians, there is an urgent need to open a dialogue on better ways to integrate the two fields. It is now realized, for example, that financial incentives, training, and new system configurations will be needed. A similar dialogue has started between the mental health and substance use care fields.

Other issues also will need to be addressed. As more effective community care systems are built in the short-term future, they will need to consider (a) the role that the faith-based community can play in prevention and early intervention, (b) the potential role of private-public partnerships, (c) the need for effective linkages with the human service community, and (d) the need for effective outreach to those who are disenfranchised or subjected to discrimination. Moreover, the new community systems must have the capacity to respond to disasters, which can have major effects on mental health and well-being similar to those experienced after the 9/11 terrorist attacks in New York and Washington, D.C.

In the distant future, several other trends can be anticipated to emerge or strengthen. One trend that is likely to affect mental healthcare is the move toward consumer- and family-centered care. Consumers and family members will seek and receive more responsibility for health and healthcare. Already, consumer-operated and peer-supported mental health services have become more common, with individuals and family

members allowed and expected to take on a greater role in the direct management of mental disease.

The use of new technologies will likely become an even more important vehicle for delivering mental healthcare. Currently, telecommunication, computer, and Internet technologies are being linked to offer “care at a distance.” Several thousand Web sites now offer interpersonal psychotherapy, expanding the scope of mental health care services, much as the telephone expanded healthcare providers’ ability to help their patients in the past. Rapid advances also are being made in voice-activated automatic-response systems and in the application of artificial-intelligence systems to real-world problems. As a result, it is now possible to receive care and guidance through a computer program without human intervention. Other automated systems are being developed to monitor—at home, in real time—and report physical symptoms to healthcare providers. As these noninterpersonal technologies become more pervasive, new concerns are likely to arise about how and when human intervention in the mental healthcare process is appropriate or even essential.

Also very promising will be the development of new genetic treatments over the next 5 to 10 years for biologically based mental disorders. To date, virtually no genetic interventions are recommended or implemented in the mental health field. Now that the basic human genome has been mapped, this situation may change radically as genetic interventions are developed for mental disorders that have a genetic basis.

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See also Access to Healthcare; Ambulatory Care; *Diagnostic and Statistical Manual of Mental Disorders (DSM)*; Disability; Disease; Epidemiology; Mental Health Epidemiology; Public Health

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- Mental Health America (MHA): <http://www.nmha.org>
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<http://www.nimh.nih.gov>
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<http://www.mentalhealthcommission.gov>
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MENTAL HEALTH EPIDEMIOLOGY

Mental health epidemiology is the study of the prevalence and incidence of mental health disorders. This entry defines basic epidemiology concepts and describes the historical development of mental health epidemiology in the United States. In conclusion, it outlines some of the promising new directions mental health epidemiology will likely take in the future.

Only in the past 30 years have public health and health services researchers been able to combine

statistical sampling methods, interviewer scales, and appropriate analytical tools and collect detailed information on specific medical diagnoses that can be generalized to a defined national population. This combination of resources has enabled researchers to measure the magnitude of mental health disorders in the United States's population. In general terms, researchers now estimate that about one quarter of the nation's adult population has a diagnosable mental disorder in any 1-year period of time and that the lifetime expectation is that about 1 in 2 adults will suffer from these disorders. For children and adolescents, the 1-year figure is about 1 in 5. For any other medical disorder (e.g., heart disease, diabetes, hepatitis), these figures would be considered signs of a public health crisis.

Some Basic Concepts of Epidemiology

To understand epidemiology, several key concepts are critical. Two important basic concepts are the *prevalence* and the *incidence* of disease. Prevalence refers to the *total* number of disease cases in a period of time for a defined population. This period of time can be 1 day in length, called *point prevalence*, or 1 year in length, called *period prevalence*. Incidence refers to the number of *new* disease cases occurring during a period of time for a defined population, either *point incidence* or *period incidence*, as differentiated above.

A major goal of epidemiology is to measure both the prevalence and the incidence of a disease. By definition, the ratio of incidence to prevalence will always be 1 or less. The higher this ratio, the greater the turnover in the diseased population. For example, depression has both a high incidence and a high prevalence, which means that there is considerable turnover in the population with this disease and that many persons with this disease recover in a relatively short period of time. In contrast, schizophrenia has a very low prevalence and even lower incidence. This means that there is a very low turnover in this population and that persons with this disease have it for a long period of time.

To measure a disease's period prevalence, measures of the number of disease cases at Time 1 and Time 2 are required. Period prevalence is the sum of these two figures (i.e., point prevalence plus incidence). Remember that the period prevalence is always equal to or greater than the period

incidence. By extension, it should be noted that point prevalence can be viewed as the sum of the disease cases at the beginning of a day plus the number of new incident cases over the course of the day.

Period incidence also requires measurement at two time points. Period incidence means that a person does not have the disease at Time 1 but develops the disease between Time 1 and Time 2. By extension, point incidence means that a person did not have the disease at the beginning of the day but developed the disease over the course of the day.

Frequently, sociodemographic factors such as age, gender, race or ethnicity, and place of residence are examined in relation to a disease. From such analyses, for example, Hollingshead and Redlich were able to determine that the prevalence of mental illness was 8 times as large in the lowest social class as compared with the highest social class.

Early Work in Mental Health Epidemiology

Beginning in 1840, the U.S. superintendent of the census began to collect information, as part of the nation's decennial census of population, on the number of persons living in households who were "insane or idiotic." Similar data were collected on persons residing in state mental hospitals. The sum of these two numbers provides a very primitive, early estimate of the prevalence of mental illness in the United States. This procedure was continued until 1900 with progressive refinement in the diagnostic categories.

After that time, specific questions on mental illness were no longer asked of the household population, but data were collected more frequently on state mental hospitals. Over time, the data collected from state mental hospitals, *treated prevalence*, became the surrogate for total community prevalence—that is, the sum of the community and hospital figures. These hospital data were reported by the U.S. Public Health Service in a publication series called *Patients in Mental Institutions*. As additional types of hospitals—Veterans Administration Medical Centers, general community hospitals, and private psychiatric hospitals—were developed in the 1930s and later, their figures were also added to these data collections.

Beginning of the Modern Era

The beginning of the modern era of mental health epidemiology can be traced to a famous study conducted in Stirling County, New York, in 1952. At that time, Stirling County was rural, with a total population of about 20,000 persons. More than 1,000 male and female adult heads of households were interviewed for the study, and the American Psychiatric Association's new *Diagnostic and Statistical Manual of Mental Disorders (DSM-1)* was used for the first time. Two psychiatrists reviewed the interview ratings. The purpose of the study was to examine the relationship between sociocultural disintegration and specific mental disorders. Lifetime prevalence was estimated at 57% for all *DSM-1* disorders measured, and current prevalence was estimated to be 90% of the lifetime rate.

An equally famous study from this period is the Midtown Manhattan Study conducted in 1954. The study population included 175,000 adults between the ages of 20 and 59 who resided in Midtown Manhattan. Of this number, 1,660 were interviewed. Two psychiatrists reviewed the ratings. The purpose of the study was to examine the relationship between stress indicators and mental impairment. Unlike the Stirling County Study, the Midtown Manhattan Study developed an overall measure of mental disorders and ratings for several symptom groups rather than ratings for specific disorders. Current prevalence was estimated at 81.5% for mild to incapacitated impairment. No lifetime prevalence figure was provided.

Both of these studies contributed significantly to the understanding of how to conduct mental health epidemiological fieldwork. However, both also had considerable limitations. Both were surveys conducted in small geographical areas, and both were focused on the noninstitutionalized population. Persons with mental illness who resided in psychiatric hospitals at the time of the studies were not counted.

It should be noted that the newly formed National Institute of Mental Health (NIMH) was developing *psychiatric case registers* at about the same time the Stirling County and Midtown Manhattan studies were being conducted. A psychiatric case register is a continuous recording of all persons who present for mental health treatment

from a defined geographical area, together with detailed treatment data. A case register is a very valuable tool for understanding the precise patterns of care provided to persons with specific disorders. The most notable of these psychiatric case registers were for the states of Maryland and Hawaii and for Monroe County, New York. The two state case registers were discontinued at the end of the 1960s, and the Monroe County case register was discontinued at the end of the 1980s.

A Landmark National Study

From the time of the Stirling County and Midtown Manhattan studies until the early 1980s, work was underway at NIMH and in the mental health research field to improve the measurement of specific mental disorders using interview techniques. At the same time, the specification of mental disorders was refined with the release of the second and third generation of the *Diagnostic and Statistical Manual of Mental Disorders (DSM-II and DSM-III)*. From these efforts came the Diagnostic Interview Schedule (DIS). The DIS was the first field survey instrument that could be administered solely by a lay interviewer and from which specific mental illness diagnoses could be derived, with further clinical review.

The DIS became the basic survey instrument for the epidemiological catchment area (ECA) project conducted in 1983 under the leadership of NIMH. This survey project was conducted among persons 18 years of age and older in five geographic areas across the nation: (1) New Haven, Connecticut; (2) Baltimore, Maryland; (3) St. Louis, Missouri; (4) Durham, North Carolina; and (5) Los Angeles, California. The purpose of the study was to produce lifetime and annual prevalence estimates for specific mental disorders and to produce estimates of the incidence of these disorders for a 1-year period. The national estimates were produced using the 1980 population figures, even though the data were collected in 1983. Annual period prevalence was estimated to be 28.1% for all disorders, and separate estimates were provided for specific disorders. A very important finding from this study was that only about 15% of the adult population received any mental healthcare, and only 6% received care from a mental health provider such as a psychiatrist or psychologist.

The ECA project was widely acclaimed at the time it was reported to the field, and its results were used broadly for policy, clinical, and financial analysis. To the present time, this study has provided the only annual incidence figures for specific diagnoses that have ever been collected on a national basis. Problems of individual recall were noted in the lifetime prevalence figures; hence, they have received relatively little attention by the field.

Current Generation of Work

Almost a decade after the ECA fieldwork was completed, a new study, the National Comorbidity Survey (NCS) was undertaken between 1990 and 1992 on a national probability sample of more than 8,000 persons, 15 to 54 years of age, from the household population. NIMH supported this new study. This effort was the very first to assess mental illness in a national probability sample. It was also the first effort to use the World Health Organization's Composite International Diagnostic Instrument (CIDI), based on the *DSM-III-R* and administered by lay interviewers. Fourteen different psychiatric disorders were assessed. Annual prevalence figures were similar to those reported from the ECA, with almost 30% of respondents having a mental illness. Lifetime prevalence was reported to be almost 50%. Equally important, more than half of all the persons with a lifetime disorder had a history of three or more comorbid disorders. Of those with a disorder in the past year, less than 20% received any care; for those with a lifetime disorder, the percentage receiving any treatment was less than 40%.

A broad range of mental health issues have been explored by researchers using NCS data, which are publicly available; numerous scientific articles have been published from it. However, NCS did not include a scale for schizophrenia, and it did not collect incidence data.

In 2001 and 2002, the same set of NCS respondents was reinterviewed. NIMH and the Center for Mental Health Services supported this effort. The reinterview study is called NCS-2. This study was conducted to examine the course of mental disorders, as well as the relationship between primary mental disorders and secondary substance use disorders. From this study, the framework of the "window of opportunity" has been developed.

This framework points to opportunities to intervene between the onset of a primary mental disorder and the onset of a secondary substance use disorder to prevent the latter.

At the same time, an NCS-R (Replication) prevalence survey was carried out on a new national probability sample of 10,000 respondents, 18 years of age and older, using a revised CIDI based on *DSM-IV*. More than 32% of the respondents had a disorder in a 1-year period, and more than 57% had a lifetime disorder.

Currently, the results from a parallel study of 10,000 adolescents, called the NCS-A (Adolescents), are being analyzed. Once reported, this study will be the first national effort to collect detailed prevalence information on a national probability sample of adolescents, 12 to 17 years of age.

Some Related National Work

In 2006, funding was provided by the Center for Mental Health Services to add mental health questions to the Behavioral Risk Factor Surveillance System (BRFSS), operated by the U.S. Centers for Disease Control and Prevention (CDC). The BRFSS is composed of 51 parallel, state telephone surveys of samples of adults and is conducted each year. The mental health questions added to the BRFSS were the first eight items from the Physician Health Questionnaire (PHQ-8), which provide a measure of depression. Unlike all earlier mental health epidemiology efforts, the BRFSS is capable of producing direct state estimates in addition to national estimates. In this first effort, 38 states added the mental health questions. Initial results will be available from the Center for Mental Health Services.

In 2007, the BRFSS work was extended by adding the K-6, a measure developed in the NCS to assess whether an adult respondent has serious mental illness. These results will be released in 2008.

Promising New Directions

As indicated above, mental health epidemiology in the United States has steadily progressed from small, local studies using inconsistent nonstandardized measures to sophisticated, national probability samples using internationally recognized and validated research instruments. The field of

mental health epidemiology is also developing the capacity to make accurate, state-level estimates, which will be very useful for state and local health planners, various departments of state government, and state policymakers.

The future will likely hold many changes for the field of epidemiology in general and for mental health epidemiology in particular. Some of the anticipated changes are outlined below.

Electronic Health and Personal Health Records

A process is already underway to implement electronic health records (EHRs) and personal health records (PHRs) in the United States. Comprehensive EHRs will contain detailed continuous information on a person's health status and the healthcare he or she receives. PHRs will translate this information into action steps that consumers will be able to take to improve their health status and the quality of their care, as well as to engage in self-care activities.

The EHRs and PHRs will provide an entirely new source of data for mental health epidemiology. These electronic files will be universal. They will be continuous records. And they will contain detailed information on the full range of a person's comorbidities. The implication is that traditional epidemiological-survey data collections will be replaced by continuous data collection from these electronic files.

To facilitate this outcome, it will be essential to ensure that very high-quality information is entered into these EHRs and PHRs, using the very best instruments available. The VistA EHR developed by the U.S. Department of Veteran Affairs for military veterans has already demonstrated how this might be accomplished. More effort needs to be spent on ensuring comparable data standards in EHRs and PHRs for items and scales measuring mental health epidemiology.

Improved Knowledge Base

Two types of scientific advances hold considerable promise for the future of mental health epidemiology. First, with the decoding of the human genome and the development of large-scale population samples of DNA, it will be possible to determine genomic patterns for persons with particular

disorders. Some mental disorders, such as schizophrenia and depression, are already known to have genetic components, at least in specific population subgroups. As this knowledge is developed, it will need to be incorporated into mental health epidemiology.

Second, major efforts are currently underway to develop what is called *personal medicine*. Stated simply, this is an effort to match care uniquely to a particular individual. Hence, rather than a general drug formulary for a psychotropic medication, the formula would be prepared specifically for each individual. Clearly, how each patient responds to a medication could be used to develop an entirely new classification system for mental disorders: Instead of relying on a series of questions to identify a particular disorder, drug responsiveness could be used for this purpose.

Enlightened Consumers

As the mental health consumer movement continues to evolve in the United States, consumers will be able (a) to better recognize the signs and symptoms of mental illness, (b) to understand and evaluate the quality of care they receive, and (c) to engage in self-help activities. This is all part of a major transformation effort to promote true recovery and independence. As this evolution progresses, consumers and the providers who serve them may become less willing to participate in national or state mental health epidemiology survey efforts. They will also want to know and understand how the results from such research can be applied directly to their own care and recovery. Hence, future research efforts will need to include new components that address these concerns and interests.

Stigma and Privacy

The mental health field has two preeminent concerns that need to be addressed on an ongoing basis. The first is stigma based on the ideas that (a) people feign mental illness and are really laggards, (b) mental health treatment doesn't work, and (c) mental health treatment is too expensive. Although these contentions are not true, they color any debate about mental health issues from the U.S. Congress to a local community group. A 1-year

prevalence of 25% may not be taken seriously as a public health crisis because of stigma and because of unfounded beliefs about persons with mental illness and the care they receive.

Major national efforts are underway to combat stigma against persons with mental illness. These efforts take the form of educational campaigns, discussions with family members and consumers, and engaging people in mental health initiatives. With an annual prevalence of 25% and a lifetime prevalence of 50%, virtually every family in the nation has one or more members who experience mental illness.

The second and related issue is privacy or confidentiality. Because of work and social discrimination, persons with mental illness are very reluctant to share information about their illness or care. These wishes for privacy need to be respected, and strong standards of confidentiality need to be enforced. And healthcare providers, insurers, employers, and other institutions all need to be held to a very high and strict standard in this area.

Those engaged in mental health epidemiology need to recognize these issues and address them head-on. To address stigma, they need to consider mental illness in the general context of all illnesses. Past research on comorbidity is a very positive movement in this direction. With regard to confidentiality, researchers need to ensure that epidemiological data are not released inappropriately, particularly as the nation moves into the era of EHRs and PHRs.

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See also Diagnostic and Statistical Manual of Mental Disorders (DSM); Disease; Epidemiology; Forces Changing Healthcare; Mental Health; National Institutes of Health (NIH); Public Health

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- Substance Abuse and Mental Health Services
 Administration (SAMHSA): <http://www.samhsa.gov>

META-ANALYSIS

Meta-analysis, a tool developed to summarize the findings from randomized clinical trials (RCTs), can be used by many scientific fields, including health services research, to statistically combine data from many individual studies. A meta-analysis adds up the results for each participant in the experimental group and in the control group of all the relevant studies and presents an easily understood summary; it also provides a visual depiction of the outcome, a *forest diagram*, in which the

results of each study are shown, making it obvious if all the studies agree or not. For example, if some studies find that an intervention or experimental group is worse than the control group, and other studies find it better, the disagreement can be seen at a glance.

The term *meta-analysis* was coined by the American statistician Gene V. Glass while he was a faculty member at the University of Colorado at Boulder in 1976. However, the practice actually originated before 1976 as many meta-analyses were published earlier. The use of meta-analysis in clinical medicine was systematically developed in the United Kingdom by the Cochrane Collaboration, an international group of thousands of volunteers founded in 1993 and named after the British epidemiologist Archibald “Archie” L. Cochrane (1909–1988). The Cochrane Collaboration is an international, not-for-profit organization that produces and maintains systematic reviews of health-care interventions, doing their meta-analysis in a standard way. These meta-analyses are published electronically in the Cochrane Database of Systematic Reviews, which are published many times a year and can be easily updated.

Meta-analysis consists of (a) a systematic search of the literature, identifying studies by predefined criteria; (b) extracting numerical results from each study for the experimental and control subjects, on various outcomes and their difference; plus (c) the calculation of parameters reflecting their statistical confidence (e.g., standard deviation and sample size).

The Meta-Analytic Method

To conduct a meta-analysis, a researcher conducts a literature search to find all the studies that meet certain predefined qualitative and quantitative inclusion or exclusion criteria. This is often computer based, with each search term and database used listed. As computer searches often miss important articles and reports, hand searches are also necessary, including searching the bibliography in each journal article to identify other applicable studies. If possible, the translations of the relevant foreign-language articles should be acquired.

It is vital that all studies in the meta-analysis meet reasonable criteria; otherwise there is the potential for bias. Meta-analysis is no better than the studies that go into it. If there is bias in even a

few studies, it will translate into bias in the meta-analytic summary. Sometimes, one will see a meta-analysis with rather exacting criteria for the selection of studies. This may defeat the purpose of a meta-analysis because having very exhaustive inclusion criteria excludes studies that do not fit with the researcher's preconceptions. For this reason, the Cochrane Collaboration always includes a list of excluded studies. The criteria for study inclusion should be simple and straightforward and capture all the well-controlled studies in a field. One can then examine some of the minor methodological differences across studies by *sensitivity analysis* and *meta-regression* to see if they do make a difference.

It is not appropriate to statistically evaluate a participant's measure twice, as if it were for different subjects. Each participant should be counted only once. To demonstrate this *double publication redundancy*, investigators may initially report on the first 20 subjects and, in another article, report on a total of 60 subjects that include the original 20 subjects. Clearly, the same participants counted twice or more will amplify any finding. In addition, bias is introduced when undue weight is given to the findings of groups reporting their data in multiple publications as opposed to those reporting their findings in only one source.

Some researchers perform multiple statistical analyses and stress the most favorable outcome. For meta-analysis, predefined systematic numerical information should be extracted from each study.

The Statistics of Meta-Analysis

Effect Size

The *effect size* is the magnitude of the difference between the intervention or experimental groups and the control groups, regardless of the sample size. This is different from the *statistical significance*, which is defined as the probability that such a finding may happen by chance, leading to the rejection of the null hypothesis. Statistical significance is dependent, in part, on the sample size, so studies with a large number of subjects may yield a highly significant result. The effect size of a *continuous variable* is frequently expressed as the mean, or average, of the experimental group minus

the mean of the control group divided by their pooled standard deviation.

Many outcomes are inherently qualitative, for example, living versus dead or having a disease versus not having a disease. For qualitative or *discontinuous* data, the effect size for an intervention-control comparison is primarily expressed as the difference between the percentages with and without an event in the experimental group and the control group using indices such as *odds ratios*, *risk ratios*, or *risk differences* to provide a measure of the differences. Inherently qualitative outcomes should be dealt with as such. Here, researchers would generally prefer using a continuous variable, but sometimes it is useful to supplement with a dichotomous variable. Dichotomizing data should be done using predefined criteria. An advantage of dichotomous data is that information from each individual subject can often be extracted (i.e., the results stem from real participants) from the observations of individual subjects rather than conducted on summary statistical parameters. This approach is inherently meaningful to researchers, whereas a change of abstract continuous units may not be.

The statistical methods for analyzing qualitative data are essentially a *stratified* or *fold contingency table*. Epidemiologists have been using these statistical methods for many years.

Studies often present a vast amount of data obtained through the use of various rating scales, measurement instruments, and statistical techniques, which makes it difficult to compare the results as they are expressed in a wide variety of units. In meta-analytic statistics, the control group mean or average is subtracted from the intervention or experimental group mean and then divided by the pooled group standard deviation, a process that is similar to the notion of *percentage change scores*. As a result, the data are expressed in uniform units. This allows researchers to focus their attention on the hypothesis they are examining rather than be distracted by the many different units among studies.

Statistical Methods

Most meta-analysis uses standard statistical techniques for continuous data and the Mantel-Haenszel model, or some variant thereof, for discontinuous data. Because continuous data possess

more power than discrete data, continuous data are preferred, when available, to derive the effect size. The sample size, mean, and standard deviations can be easily extracted from RCTs as well as many other types of published studies. Unfortunately, many reports provide the sample size and means for the assorted groups but do not report the standard deviations (or standard error of the mean) that are needed for effect size calculations. Standard deviation or its equivalent should always be reported. Sometimes, standard deviations can be computed from the results of the statistical test presented. Part of meta-analysis is the calculation of variance in standard units. Meta-analyses can be done with fixed (assuming each study to have a fixed effect size) or random models (not assuming this). Generally, random models put more emphasis on the smaller studies.

Consistent Results

One of the major objectives of meta-analysis is to demonstrate, when studies are combined, that the findings are consistently homogenous. When consistent findings are present, some studies will be clearly statistically significant whereas others may have strong nonsignificant trends in the same direction, which summates the essential agreement, because the results are similar.

Sensitivity Analysis and Meta-Regression

The pattern and consistency of results across all studies is vital. For example, if there are several small-sample, positive RCTs and many large-sample, negative trials, it is likely that the smaller studies were deviations or wishful thinking. If the results between individual studies are highly dissonant, it is erroneous to conclude that the overall effect is statistically significant. Rather, the prudent conclusion is that some studies show intervention effects and others do not, which requires the researcher to explain this discrepancy. It is preferable to appraise studies by a priori criteria for methodological precision and then examine if there is a similar effect size in the more rather than less rigorous studies.

There are many arbitrary assumptions that can go into a meta-analysis, involving how to classify studies and the exact criteria for inclusion. It is

important to perform a *sensitivity analysis* by analyzing the same data set with different assumptions, often with 5 to 10 alternate examinations. The blinding and randomization or other methodologies protect against bias. Sensitivity analysis is recalculation of the meta-analysis under different assumptions. Frequently researchers will drop a certain type of study to determine if the other studies produce the same results as the total, thereby demonstrating that the overall results are not an artifact of a given type of study. A sensitivity analysis can be done by using a different choice in deciding which studies to include, or a different outcome measure. However, the problem with dropping studies is the loss of statistical power.

A *metaregression* differs in that it includes all the studies but examines whether there is a systematic difference between one or another *moderator variable*. The moderator variables could be continuous or dichotomous (i.e., the meta-analytic equivalent of analysis of variance or analysis of covariance). The moderator variables are not randomly assigned nor are they usually blinded. Many biases could affect moderator variables. The same cautions that apply when imputing cause from statistical correlation analysis apply to a meta-regression as it is an exploratory technique.

The Graphic Inspection of Results

The quintessence of meta-analysis is the inspection of the data. Thus, this method generates a visual or numeric illustration of each study in the context of all the others. A review of the actual data gives the analytical reader a feel for the data. When the results from several studies are converted into similar units, a simple inspection of a graph or table quickly displays which trials have dissimilar outcomes from the majority. Such disparate outcomes can also be examined by a variety of statistical parameters. For example, a researcher can calculate a statistical *index of homogeneity*, whereby he or she can remove the most discrepant study from the analysis, recalculate, and in so doing reveal that all but one study in the data set are homogenous. If two studies are discrepant, then the researcher can remove both from the study and again recalculate the parameters of statistical homogeneity, and so on. When there are a number of blinded studies, the interpretation of

efficacy is usually straightforward, particularly when the results are not statistically significant. A few biased studies mixed in with valid studies might produce a significant difference. In interpreting the results of the meta-analysis, it is important to examine the effect size and its significance, as well as the consistency of the results. The confidence interval or standard deviation and sample size provide a bridge to inspect uncertainty in the same units.

Meta-Analysis Versus Narrative Reviews

Narrative reviews of scientific findings are often based on clinical wisdom and can be highly subjective: The author of a narrative review may accept the results of studies without any critical assessment. The author may summarize several highly publicized references in support of a certain position, even reporting redundant data, but the reader may discover that many of the quoted studies are inadequately controlled. The author selectively chooses what studies to mention and selects what aspects to mention or omit, as well as giving his or her opinion as to what the bottom line is. Additionally, limited evidence from controlled studies failing to find a big difference is often interpreted as finding the opposite result. But an area that is not studied does not imply the opposite of the hypothesis, only insufficient studies. Ideally, the researcher should carefully consider each individual study before coming to any conclusions. However, when there are many controlled studies, the individual researcher often cannot remember all the results. Thus, a meta-analysis can often provide a more meaningful summary than a narrative review.

The File Drawer Problem

One of the most important drawbacks in meta-analysis is the “file drawer” problem. Researchers have found that positive findings are much more likely to be published than negative findings. And positive findings are more likely to be printed in more prestigious journals. Estimates can be made according to assumptions about such a pattern. An example of such estimates is the *funnel plot*, which is often included in a meta-analysis. However, such plots are no better than the assumptions

underlying them. To minimize this bias, researchers recommend including all reasonable-quality studies as well as search reports of symposia, meeting presentations, relevant Web sites, exhibits, and other available unpublished data; they also recommend contacting investigators and funding sources for data and, if necessary, obtaining data using the Freedom of Information Act.

One safeguard is to calculate the number of participants whose negative results (hypothetically hidden in a file drawer) would convert a positive meta-analysis to a negative one (the fail-safe number). It seems likely that the file drawer issue is also a problem for narrative reviews as they generally do not seek to consider all relevant studies.

Omnibus Methods

Meta-analysis does not simply count the number of studies that display a significant difference, average their means not weighted by sample size, or add up the *p values*. These methods, which are referred to as omnibus or vote-counting methods, have many methodological problems. The results obtained by adding *p values* can be excessively influenced by a few disparate studies, as shown by various researchers using simulation models.

Implications

A large literature on meta-analysis has developed over the years, documenting the extensive experience and the methodological and statistical issues associated with it. The most important aspect of a meta-analysis, no matter how technically excellent, is no better than the soundness of the judgment that goes into the selection of the studies and their interpretation so that they make sense mechanistically.

Although meta-analysis has been traditionally used to summarize RCTs and genetic studies, it can also be used to summarize various health services research studies, case-controlled studies, observational studies, or even uncontrolled studies that use a common methodology. Knowledge of the data provides some empirical benchmarks to help distinguish empirical findings from the results of dogma, wishful thinking, or political pressures.

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and Stefan Leucht

See also Benchmarking; Causal Analysis; Cochrane, Archibald L.; Cohort Studies; Cross-Sectional Studies; Evidence-Based Medicine (EBM); Measurement in Health Services Research; Randomized Controlled Trials (RCTs)

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Cochrane Collaboration: <http://www.cochrane.org>

MIDWEST BUSINESS GROUP ON HEALTH

The Chicago-based Midwest Business Group on Health (MBGH) is a leading regional healthcare coalition of major private and public employers. The MBGH works with its member employers to help them control and lower their healthcare costs and obtain more value for their healthcare benefit dollars. As an organization, the coalition offers its members a wide variety of health benefit, educational seminars; networking opportunities; initiatives and demonstration projects; and group purchasing programs. The MBGH is also a member of the National Business Coalition on Health (NBCH).

Background

Established in January 1980 by a small group of large, Midwest employers, the nonprofit MGBH has grown to include more than 80 major employers responsible for more than 2 million covered lives in 11 states. These employers collectively spend more than \$2.5 billion annually on their employees' healthcare benefits. Over the years, the coalition's mission has also broadened and expanded. Initially, it was mainly concerned with ways to lower and control the costs of healthcare; today, it also addresses the quality, safety, and value of healthcare.

Membership

The MBGH is primarily funded through employer membership dues. Membership is for a 12-month period with dues based on the employer's number of U.S. workers. Public and nonprofit employers receive a 50% discount off their membership dues. Specifically, the coalition has four membership categories: (1) business members, which are for-profit organizations (e.g., Bank of America, Caterpillar, and Ford Motor Company); (2) provider members, which are community-based healthcare provider organizations such as hospital systems (e.g., Advocate Health Care, Alexian Brothers Hospital Network, and Carle Clinic Association); (3) nonprofit and government members, which include academic, research, and government organizations (e.g., the Federal Reserve Bank of Chicago, the state of Illinois, and the University of Chicago); and (4) associate members, which include providers of healthcare and medical products or consulting and management services (e.g., Abbott Laboratories, Deloitte, and Johnson and Johnson Health Services).

Organizational Structure

The MBGH is governed by a board of directors, which consists of the president, chief executive officer, and secretary of the coalition and 18 board members. The board members are elected from the various member employers. A professional staff of six individuals—the president, vice president, director of projects and communications, director of operations,

membership and administration coordinator, and projects coordinator—manages the coalition.

Products and Services

The MBGH provides three types of services to its member employers: (1) learning network programs, (2) health benefit purchasing groups, and (3) health benefits and quality initiatives. These services help member employers connect and learn from each other as well as obtain various products and services.

The coalition's learning network programs include the following: (a) monthly learning network meetings; (b) an annual conference; (c) employer, health, roundtable discussions; (d) health system user groups; (e) benchmark survey services; and (f) monthly, Medicare, employer forum telephone calls. The employer, health, roundtable discussions address pharmacy benefits, consumer-directed health plans (CDHPs) and consumerism, union benefits, and wellness and health management issues.

To help its member employers obtain competitive rates, superior services, performance evaluations, and performance guarantees, the MBGH has established an affiliate, the Midwest Health Purchasers Foundation (MHPF), which provides various health benefit purchasing groups. The foundation helps coalition member employers (a) enroll their workers in several Chicago health maintenance organizations (HMOs), (b) obtain pharmacy services (e.g., retail, mail, and specialty drugs), (c) obtain health promotion and risk management services, (d) obtain disease management services (e.g., acute-care counseling, and high-cost case management), (e) obtain audit services to examine the performance of third-party administrators (TPAs) and health plans, (f) manage Medicare Part D services, and (g) implement and manage incentive programs and products.

The MBGH undertakes a large number of health benefit and quality initiatives. Specifically, the coalition develops and supports various initiatives that test healthcare measurement tools and improve community health. Some of its recent initiatives include (a) an employee self-report tool that analyzes the impact of chronic disease on productivity; (b) measuring the costs of overuse, underuse, and misuse of healthcare and the role of purchasers in addressing these problems;

(c) determining what information consumers want to know about their physicians; and (d) studies of employer adoption of value-based benefit strategies and the correlation of benefit incentives to changes in employee behavior.

In 2003, the MBGH's initiative on the cost of overuse, underuse, and misuse of healthcare gained national attention with its estimate that about 30% of all direct healthcare outlays are the result of poor quality of care. In 2007, the MBGH, working with two pharmacist associations, initiated Taking Control of Your Health, a diabetes management demonstration project. The project uses specially trained pharmacists to conduct individual meetings with employees to help educate, motivate, and empower them to better manage their diabetes. In 2008, the coalition received a grant from the National Business Group on Health (NBGH) to expand the program.

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See also Cost Containment Strategies; Cost of Healthcare; Employee Health Benefits; Health Insurance; Health Insurance Coverage; Leapfrog Group; National Business Group on Health (NBGH); Pacific Business Group on Health (PBGH)

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National Business Coalition on Health (NBCH):

<http://www.nbch.org>

MILBANK MEMORIAL FUND

For most of its history, the Milbank Memorial Fund has collaborated with decision makers in the public and private sectors to use the best available evidence and experience in making policy for healthcare and population health. Its founders, Elizabeth Milbank Anderson—who provided the endowment in increments between 1905 and 1921—and Albert G. Milbank—who led the board from 1905 until his death in 1949—dedicated the fund to devising effective policy to improve the well-being of people, especially those with low incomes.

History

The fund's history can be divided into five segments: (1) 1905 to 1920, (2) 1921 to 1936, (3) 1937 to 1961, (4) 1961 to 1989, and (5) 1990 to the present. From 1905 until Elizabeth Milbank Anderson's death in 1920, the Memorial Fund Association, as it was then called, worked with officials of government and charitable agencies that served the poor in New York City. Notable projects included constructing public baths on models devised by health officials in Europe; increasing children's access to health and related services; and demonstrating the feasibility of a "home hospital," residences, and health services for families, one or more members of which had tuberculosis.

Between 1921 and 1936, the fund and its allies in government and medicine addressed major issues in improving access to appropriate healthcare and related services. Its first chief executive, John A. Kingsbury, a veteran manager in city government and charitable organizations, organized multiyear demonstrations of new methods of integrating services provided by the government and charities in New York City, Syracuse, and rural Cattaraugus County, New York. The fund appointed a technical board of prominent health experts to advise and evaluate these projects. This board produced a periodic bulletin evaluating the work of the demonstrations and commissioned a book about each of them. The bulletin, published continuously since 1923, is now the *Milbank Quarterly*.

The fund addressed controversial issues of health policy between 1926 and 1935. In 1926, for example, it helped organize the consortium of foundations to finance a Committee on the Costs of Medical Care (CCMC). Research reports by the committee's staff are landmarks in the history of health services research. In 1932, however, most of the physician members of the CCMC refused to sign its final report because it recommended the prepayment of healthcare and the reorganization of physicians into large group practices dominated by specialists.

Kingsbury and his staff at the fund advocated including these recommendations, as well as funding to expand access to health services, in the Social Security Act of 1935. The fund seconded two employees to the staff of the cabinet-level committee that drafted what became the Social Security Act. This advocacy increased antagonism toward the fund among critics of the CCMC report in organized medicine. Several medical societies recommended that physicians advise mothers to boycott Borden's condensed milk—an ingredient in infant formula—because stock in that company accounted for a substantial percentage of the fund's assets. In 1935, the board of the fund fired Kingsbury but reaffirmed its commitment to increased access to health services.

During the next quarter century, the fund maintained this commitment but through projects and publications that avoided controversy. Its chief executive from 1937 to 1961, Frank Boudreau, was a public health physician who had joined the new social medicine movement as an official of the League of Nations. He led the fund in conducting and commissioning policy-related research on nutrition, fertility and birth control, and mental health. The fund convened annual conferences addressed and attended by researchers and policy-makers. In the 1950s, fund staff helped inform policy on substituting community for institutional care of the mentally ill and facilitated the establishment of the Population Council.

The fund chose not to prioritize activities related to policy between 1961 and 1989. Alexander Robertson, chief executive from 1961 to 1967, managed a fellowship program in social medicine for young academic physicians from North and South America. His successor from 1967 to 1977, Leroy Burney, accorded priority to the reform of

higher education for public health. The next chief executive, Robert H. Ebert—1978 to 1984 and 1988 to 1989—organized a fellowship program in clinical epidemiology; several of its alumni became leaders in the field subsequently called evidence-based health research and practice. Sidney Lee, 1984 to 1988, mounted projects to improve the health of migrant and seasonal workers and their families.

In the 1960s, the *Milbank Quarterly* became, and has remained, a highly regarded, international journal of research on health services and policy and on population health. The fund was designated an operating foundation under 1967 amendments to the Internal Revenue Code on the basis of the *Quarterly* and miscellaneous reports.

Since 1990, however, the fund has used its regulatory status as an operating foundation to collaborate with many decision makers in the public and private sectors to bring the best available evidence to bear on policy and practice. A new chairman, Samuel L. (Tony) Milbank (1990 to present), and two presidents, Daniel M. Fox (1990–2007) and Carmen Hooker (2007 to present), led this restoration of what had been the fund's mission during its first half century.

Future Implications

The fund currently prioritizes responsiveness to its constituents, who are mainly decision makers but also include researchers who are able to inform policy in the United States and other countries. The fund's largest program since the early 1990s has been its partnership with the Reforming States Group (RSG). The RSG is a voluntary association of senior officials of the legislative and executive branches of government from each of the states, from most Canadian provinces, and recently, from Australia, England, and Scotland. Its members assist one another to acquire and assess evidence and experience that could improve policy for healthcare and population health.

In addition to its work with the RSG, the fund and its constituents have recently addressed issues that include (a) public health law reform, (b) the adequacy of the income available to retirees over the next generation, (c) the importance of global health issues for American foreign and security policy, and (d) improving long-term and palliative

care. The fund continues to publish the *Milbank Quarterly* and occasional reports and copublishes a book series with the University of California Press.

Daniel M. Fox

See also Committee on the Costs of Medical Care (CCMC); Health Insurance; Health Services Research Journals; Public Health; Public Policy

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Web Site

Milbank Memorial Fund: <http://www.milbank.org>

MINIMUM DATA SET (MDS) FOR NURSING HOME RESIDENT ASSESSMENT

The provision of appropriate care in nursing facilities requires comprehensive knowledge of residents' strengths, weaknesses, and problems. As one feature of the Omnibus Budget Reconciliation Act of 1987 (OBRA 87), the U.S. Congress sought to ensure the availability of such information by mandating a national resident assessment system, including a uniform set of items and definitions for assessing all residents in

nursing facilities in the United States. The need for uniform resident assessment in long-term care had been long recognized. A 1986 study by the national Institute of Medicine (IOM) focused on how to improve nursing home regulation and identified uniform resident assessment as a cornerstone of any effort to improve quality. Indeed, this recommendation, along with a host of others in the Institute's report, formed the basis for many of the nursing home reform provisions in OBRA 87, requiring each certified nursing facility to conduct a comprehensive, accurate, standardized, reproducible assessment of each resident's functional capacities.

In 1988, the Health Care Financing Administration (HCFA) (now the Centers for Medicare and Medicaid Services [CMS]) contracted with the Research Triangle Institute, the Hebrew Rehabilitation Center for the Aged, Brown University, and the University of Michigan to develop and evaluate a uniform resident assessment system. The resident assessment instrument that emerged was designed as a minimum data set (MDS) of items, definitions, and response categories aimed at providing a comprehensive assessment. In addition, the resident assessment protocols (RAPs), which are part of the resident assessment instrument (RAI), provide guidelines for more in-depth assessment of 18 conditions that affect the functional well-being of nursing home residents (e.g., falls, urinary incontinence, cognition difficulties, and use of restraints).

Development of the Instrument

In developing the RAI, more than 60 prior assessment instruments that had been developed for screening, admission, and research purposes were reviewed for comprehensiveness and to identify common domains, items, definitions, responses, and scoring patterns. These were used to develop multiple instrument drafts, all of which underwent extensive review by literally hundreds of experts representing all the professions that work with nursing home residents. The resulting instrument contains more than 300 data elements, many of which measure the traditional domains of functioning, personal-care activities, and the amount of "hands-on" and supervision time associated with each

personal-care area, as well as basic demographic factors. Other domains covered in the MDS include (a) decision making; (b) behavioral problems; (c) symptoms, diagnoses, and conditions; (d) social interaction and regulations; (e) skin care needs; and (f) services received. Newest of all were data elements about the residents' life-long behavioral styles and preferences, as well as documentation of the existence and type of an advance directive.

Field Testing

As with all research instruments, extensive field testing and reliability testing were undertaken. Numerous sets of independent reliability trials were undertaken during the development processes. The results of these reliability studies clearly demonstrated that when MDS data are gathered in a research context, it is possible to obtain reliability levels that make the data useful for research purposes. The MDS items met traditional standards of good reliability in key areas of functional status such as cognition, activities of daily living (ADL) performance, continence, and disease diagnoses.

Development of reliable data on the functional status of nursing home residents is a task that largely defies traditional approaches to measurement. Nursing home residents are a special population and present special measurement challenges. Most nursing home residents have some level of cognitive impairment and exhibit behavior changes. The abilities and status of many nursing home residents with physical or cognitive impairments vary throughout the day and over time. Still others have communication difficulties that impede traditional research interview interactions. These characteristics seriously limit the effectiveness of simple "point in time" estimates of a resident's status, no matter how well standardized, and argue against relying on a single informant, which is the usual approach with research instruments. For these reasons, the assessment approach incorporated in the MDS relies on the input of multiple individuals who interact with the resident throughout the course of the day or night.

As part of an evaluation of the national implementation of the MDS, the quality-of-health status and the resident assessment information in the

residents' charts before and after the implementation of the MDS was addressed. Research nurses extracted data from a sample of more than 2,000 nursing home residents in more than 250 randomly selected facilities in 1990 and again in 1993. The analyses revealed that, in 1990, accurate information was available in 68% of the items in the patients' records, whereas in 1993, that average had climbed to 84%. Although accuracy levels from records sampled from participating nursing homes varied considerably in the 10 states studied, in all cases there was an improvement in data accuracy associated with the introduction of the MDS.

The most recent reliability study of the MDS compared the assessments performed by *facility* nurses—on between 25 and 30 residents from more than 250 facilities located in 10 states—with those undertaken by *research* nurses uniformly trained by a team of researchers. Of the more than 100 items evaluated, almost all revealed high levels of reliability, although there was substantial inter-facility variation that suggests that some facilities departed from the standard approach. These findings are consistent with studies finding substantial disagreement between selected MDS items in residents' charts and research data collected about the same residents.

Clinical Scales

The utility of the MDS for clinical and research applications has been further enhanced by the development of concise and clinically meaningful scales summarizing the functioning of individual residents. For example, the Cognitive Performance Scale, which replicates the mini-mental-status exam at an accuracy of nearly 90%, has been developed from items in the MDS. Similarly, an ADL scale that captures the hierarchy of ADL performance has been formulated and a new measure of “social engagement” developed, which is one of the first efforts to quantify a qualitative aspect of the personal and social interactions of an individual in a nursing home. Other summary measures of items in the MDS include measures of mood, behavioral disruption, medical instability, and more refined aspects of cognitive and executive functioning, including qualitative features of dementia.

Computerized Data

To facilitate ongoing quality monitoring and case-mix reimbursement for both Medicare and state Medicaid programs, the Centers for Medicare and Medicaid Services (CMS) mandated the computerization of all MDS data in 1998. Since then, all MDS assessments are computerized and transmitted to a national repository maintained by CMS. These data are used (a) by state regulators charged with inspecting nursing homes to ensure compliance with the Medicare and Medicaid conditions of participation, (b) by Medicare and some state Medicaid programs to differentially pay facilities as a function of the acuity of their residents, and (c) to create quality measures that are publicly reported on national Web sites to assist individuals and their families in selecting a nursing home. Furthermore, nursing facility management—as a stimulus to guide and initiate internal quality improvement efforts—increasingly uses MDS data on residents' acuity, pattern of services use, and quality.

Use for Policy, Regulatory, and Quality Improvement

The MDS is being extensively used for policy, regulatory, and quality improvement purposes. The new measure of resident case-mix, which is being used to reimburse facilities differentially (Resource Utilization Groups—III), is based on the MDS. State regulators inspecting nursing homes also use the MDS in residents' charts to determine whether the residents assessed as potentially having selected care needs are getting the relevant services. Finally, drawing on the concepts of statistical quality improvement, quality indicators are being developed as benchmarks against which nursing homes can compare their quality of performance.

The impact of the nationally mandated MDS for U.S. nursing home resident assessment has been profound. The MDS has also been adopted in other nations. As of 2008, the MDS has been translated into 20 languages (e.g., French, Spanish, Italian, Swedish, German, Chinese, Japanese, and Korean). Canada and Iceland have adopted a version of the MDS as the basis for reforming their own nursing home programs and to institute

case-mix reimbursement and quality management programs. Finland, Germany, Italy, and Switzerland have instituted experiments in large geographic areas. An international organization, the InterRAI, has been formed with the express purpose of sharing experiences in implementing the MDS as (a) a clinical-care-planning tool, (b) an administrative information system for management decisions, and (c) a basis for policy analysis of a nation's health-care system.

Future Changes

The original, national Institute of Medicine (IOM) recommendations suggested that the MDS not be static. In keeping with that suggestion, CMS commissioned an early redesign of the initial instrument, and this was implemented in 1996. Nearly a decade later, CMS has announced that it will be introducing a major redesign of the MDS (Version 3.0) in 2009. This new instrument has the benefit of many years of additional research on the utility of various measures of quality, functional performance, and clinical-care needs. It also has benefited from considerable additional research focused on capturing the "voice" of the residents' experiences and quality of life. Changes from the earlier versions include a focus on directly interviewing the residents and an emphasis on their quality of life in addition to their quality of care. This means that facility staff will first attempt to directly ask residents questions about their experience in the home, with all the associated problems of response acquiescence, residents' unwillingness to complain, and cognitive impairment difficulties. Whereas earlier versions of the MDS appeared to underestimate the prevalence of psychosocial problems, it is likely that new difficulties will arise with the revised version. Nonetheless, in keeping with the spirit of the original recommendation, resident assessment instruments must be dynamic, reflecting the changing context of nursing home care and the case-mix of the patients served.

In many ways, the introduction of the MDS has catapulted the nursing home industry into the information age. It is possible, given the implementation of the MDS, that the goals of the IOM recommendations may be reached and that ongoing comprehensive assessment may actually have a

positive impact on the quality of care for nursing home residents.

Vincent Mor

See also Activities of Daily Living (ADL); Centers for Medicare and Medicaid Services (CMS); Long-Term Care; Nursing Home Quality; Nursing Homes; Quality of Healthcare; Skilled-Nursing Facilities; Vulnerable Populations

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- InterRAI: <http://www.interrai.org>

MORAL HAZARD

Moral hazard arises in implicit and contractual relationships in which one party behaves differently because of the relationship, and these actions improve one party's utility but have a negative consequence for the other party. In healthcare, moral hazard is most commonly associated with insurance, where the purchase of health insurance induces an increase in the likelihood of a loss covered by the insurance policy, the size of the loss, or both the likelihood and size of the loss.

Asymmetric Information

Moral hazard arises because of asymmetric information between the two parties. When one party, the *agent*, has more information than another party, the *principal*, in a relationship, the agent can take actions that are not observable to the principal and that benefit the agent but are costly to the principal. If the information and actions were perfectly observable to both parties, the agent would be unlikely to take these actions. For example, an individual without auto insurance may take many precautions to prevent his or her car from being stolen: He or she may only park the car in security-monitored parking lots, install a security system, and make certain that no valuables are left in plain sight in the car. If this individual purchases an auto insurance policy that fully insures against theft, the individual may not take any of these precautions—he or she may park in high crime areas, not use a car security system, and leave valuables in plain sight in the car—because the individual knows that the insurance company will reimburse him or her if the car is stolen. As the insurance company cannot monitor how the individual safeguards the car against theft, these actions benefit the individual; it takes less time and effort not to use these safeguards, but by not taking these actions, he or she increases the chance that the car will be broken into or stolen. In economic terms, this increases both the likelihood of a loss occurring and the size of the loss, if a loss occurs.

Although both moral hazard and *adverse selection* arise because of asymmetric information between parties, moral hazard is a “hidden action”

taken by the agent, which is not observable by the principal. Adverse selection, on the other hand, is known as a “hidden type” or “hidden information” problem where the principal cannot observe the characteristics of the agent before entering into an implicit or explicit contract, and the agent makes decisions about the relationship that benefit him or her but are costly to the principal.

Health Insurance

Moral hazard in health insurance can occur in two basic ways. *Ex ante* moral hazard occurs when an insured individual takes less preventive care than he or she would take if the individual did not have insurance, and these preventive-care efforts would reduce the likelihood or size of a loss covered by the insurance policy. The second type of moral hazard occurs *ex post*, when an individual demands more healthcare services when covered by an insurance policy than he or she would demand if the individual paid the full cost of healthcare. The evidence that *ex post* moral hazard exists in health insurance is quite strong. Although there has been less evidence in support of *ex ante* moral hazard, it is gaining attention in the health insurance market.

Ex ante moral hazard includes the actions taken by an insured individual prior to contracting an illness or disease that increase the probability of contracting the illness or increase the cost of medical care covered by health insurance once the illness is contracted. Examples of *ex ante* moral hazard include a lack of preventive care, for example, an unhealthy diet, sedentary lifestyle, and other health behaviors that increase the likelihood of obesity and chronic health conditions such as heart disease and diabetes. Through healthy-lifestyle behaviors such as a healthy diet and physical exercise, an individual can reduce the risk of these chronic conditions. The theory of *ex ante* moral hazard suggests that individuals who have insurance will invest in fewer healthy-lifestyle behaviors than those without health insurance because they do not bear the full cost of their unhealthy-lifestyle behaviors when covered by insurance.

Ex post moral hazard takes place after a loss occurs—in healthcare, this means after an individual becomes ill. Without health insurance coverage, an individual will purchase healthcare

services up to the point where the marginal cost of these services is equal to the marginal private benefit obtained from these services. Health insurance coverage reduces the marginal cost of these services that is paid by the consumer. Therefore, with health insurance coverage, the consumer still purchases services up to the point where his or her private marginal cost of these services equals his or her marginal private benefit. However, in that the consumer's marginal private cost is reduced, the quantity of services consumed is higher. As the generosity of a health insurance policy increases, ex post moral hazard also increases, because the consumer bears a smaller proportion of the cost of care. In the most extreme case where an insurance policy fully covers the cost of medical care and the consumer has no out-of-pocket costs, the consumer uses medical care up to the point where he or she obtains almost no marginal benefit from these services, even though the full cost of care is still paid by the insurer.

Solutions

Health insurers use a combination of mechanisms targeted at the demand for care (i.e., mechanisms that are targeted at consumers or enrollees) and the supply of care (i.e., mechanisms targeted at healthcare providers) to mitigate ex post moral hazard. Demand-side mechanisms shift some of the risk originally borne by the insurer to the enrollee through deductibles and coinsurance. Shifting risk to the enrollee increases the marginal cost of care consumed by the enrollee. Although increasing enrollee cost sharing mitigates moral hazard, the trade-off is a reduction in risk spreading, which is an inherent purpose of health insurance.

Supply-side mechanisms are strategies that target providers, including financial incentives such as reimbursement strategies and nonfinancial incentives such as the use of gatekeeper primary care physicians, second opinions, prior authorization, and review of usage. The use of capitated per-member-per-month compensation rather than per-unit fee-for-service reimbursement is one solution that has been used to reduce moral hazard. Fee-for-service reimbursement aligns the financial incentives of the healthcare providers with the enrollees, incentivizing the delivery of more

services or more expensive services than necessary. A shift to capitation removes the financial incentive to provide more than necessary care. Instead, the provider is incentivized to provide efficient services to treat an illness, aligning the provider's incentives with the health insurer rather than the enrollee, thereby reducing the extent of ex post moral hazard.

Solutions to mitigate ex ante moral hazard need to incentivize enrollees to obtain preventive care by reducing the financial and nonfinancial costs of taking preventive actions or by increasing the marginal costs of failing to take preventive actions. Health insurers may fully cover the costs of immunizations, for example, to encourage enrollees to obtain them.

Future Implications

The U.S. federal government and private health insurers alike have been promoting *consumer-directed health plans* (CDHPs)—high-deductible health plans with health savings accounts—as a mechanism to control increasing healthcare costs. CDHPs directly target ex post moral hazard. These plans shift a greater proportion of the risk to the consumer and, by increasing the consumer's cost, require him or her to share the burden. CDHPs give the consumer an incentive to search for and obtain the most efficient healthcare services. For CDHPs to be successful, however, both prices and information on the quality of care must be transparent and publicly available so that consumers can compare across both treatments and healthcare providers to identify the most efficient method and provider of care. Although the nation's healthcare industry is improving the dissemination of information on the quality of healthcare through Web sites such as Hospital Compare, information is not yet easily available to all consumers. For example, not all consumers have access to or know how to use the Internet. Furthermore, solutions to mitigate moral hazard must be balanced with trade-offs that increase the risk borne by the individual consumer. The nation's healthcare industry is still searching for the optimal combination of risk spreading and moral hazard.

Tricia J. Johnson

See also Adverse Selection; Capitation; Consumer-Directed Health Plans (CDHPs); Healthcare Markets; Health Economics; Health Insurance; Payment Mechanisms; RAND Health Insurance Experiment

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 RAND Health Insurance Experiment:
<http://www.rand.org/health/projects/hie>

MORBIDITY

The term *morbidity* comes from the Latin word *morbidus*, meaning a condition of being unhealthy or having a disease or an illness. Today, morbidity refers to an illness, disease, or disability. It also includes the burden caused by a health condition or the state of poor health. Morbidity is often measured using the incidence or prevalence rates of a disease in a population. Public health and health services researchers study the incidence rates of diseases to determine trends. For example, the incidence rate will show whether a specific disease is increasing or decreasing in a population. In contrast, the prevalence rate will show the overall burden of a disease, which may be used to

determine the resources needed and consumed for treatment.

Overview

Morbidity or illness greatly affects an individual's as well as a population's quality of life. When trying to define or measure the factors that cause some individuals to be unhealthy, it is important to also understand the concept of health. The determinants of health have been acknowledged by the World Health Organization (WHO) to include (a) the social and economic environment, (b) the physical environment, and (c) the person's individual characteristics and behaviors. As the leading causes of illness and death have shifted from infectious diseases to chronic diseases, there has been much work to better understand the social determinants of health and the causes of morbidity. Some commonly used indicators of a population's health include the presence of child abuse, poverty, youth suicide, alcohol-related traffic fatalities, teenage drug use, depression; social networks and social capital.

Measures of Morbidity

Since the mid-1800s, conditions affecting health status began to be measured in a routine and systematized manner in the United States. As a result, incidence and prevalence rates have been used to measure the presence and rate of illnesses or conditions that interfere with a population's well-being. The *incidence rate* is also known as the cumulative incidence or the number of new cases of a disease or condition, and the *prevalence rate* refers to the number of existing cases of a disease or condition in a population.

The incidence rate can be calculated and used whenever a condition (physical or mental health related) has a defined diagnosis. Incidence rates can also provide a measure of the risk of acquiring a particular condition. An example of the incidence rate of diabetes in a city of 141,000 residents with 535 new cases of diabetes in 2008 would require the following calculation: $535/141,000 = 0.00379$ or 3.8 per 1,000 population. Given that the incidence rate of diabetes was 0.4%, if an individual was a member of that population he or she had a 0.4% chance of getting diabetes. It should be

cautioned that extrapolating population data to individuals can be misleading because individual risk factors and behaviors vary widely.

The second common measure of morbidity is prevalence. For example, if a researcher was interested in the prevalence of breast cancer among women in a given city with 141,000 residents and there were 5,076 cases of breast cancer during 2008, the prevalence rate would be calculated as follows: $5,076/141,000 = 0.036$ or 36 per 1,000 population. Because prevalence also measures the total number of existing cases of a condition in a population, it can be used to determine the burden of that disease on society. In other words, knowing that 36 residents per 1,000 population, or 5,076 residents currently have breast cancer can give some guidance as to the demand for healthcare services as well as the public health programs that should be provided.

By examining the incidence and prevalence rates, the trends and patterns in the distribution of diseases can be studied. From this information, decisions can be made in terms of resource distribution and planning efforts for prevention and treatment.

In addition to the morbidity associated with specific conditions, it is important to be aware that in many populations, especially the elderly, there will be multiple morbidities (comorbidities) present at the same time. Thus, comorbidities must also be taken into account to understand the full burden of disease.

Measures of Disease Burden

Measures of morbidity, which generally include quality of life or years of life lost due to an increase in morbidity, are difficult to quantify. However, several measures of morbidity have been developed that combine the concepts of the number of years lived with the quality of those years. The two most commonly used measures are the disability-adjusted life year (DALY) and the quality-adjusted life year (QALY).

The DALY was developed by the Global Burden of Disease study by the WHO as a means of estimating the burden of disease in various parts of the world. This study not only looked at life expectancy tables but also factored in the burden of injuries, risk factors, and diseases. DALYs combine the effect

of years of life lost prematurely and the disability of a population. As a result, mortality and morbidity are combined into a single measurement.

QALY is another method of measuring the burden of disease by taking into account not only the quantity of years lived but also the quality of life. Each year of perfect health is rated as 1.0 and death is rated as 0. QALYs are often used in cost-utility analyses to measure the effectiveness of specific medical interventions. Regarding the use of QALYs, there have been several debates as to whether some years should actually be rated with negative numbers, because some conditions might be viewed as worse than death. Furthermore, it is difficult to define what is “perfect health.”

The Compression of Morbidity

Due to the increasing recognition of the growing burden of disease, there is now a greater emphasis on the *compression of morbidity*, that is, reducing the number of years that individuals are affected by chronic diseases. The goal of the compression of morbidity is to keep populations disease free for as long as possible. The objective of the compression of morbidity is to decrease the number of years that an individual suffers from disease at the same time maximizing his or her life span. It has been suggested that aging-related morbidity can be reduced through healthier lifestyles.

The Global Burden of Disease

In one of the most comprehensive research projects ever undertaken to look at the global burden of disease, the WHO identified the most important risk factors that are the causes of disability, disease, and death in the world today. Globally, the top 10 risks are (1) being underweight; (2) having unsafe sex; (3) having high blood pressure; (4) using tobacco; (5) consuming alcohol; (6) having unsafe water, sanitation, and hygiene; (7) having iron deficiency; (8) having indoor smoke from solid fuels; (9) having high cholesterol; and (10) being obese.

In developing countries, such as those in sub-Saharan Africa, being underweight is the major cause of disease burden; this condition also affects hundreds of millions of the poorest people throughout the world. On the other hand, in developed

countries the leading risks of disease are tobacco use, alcohol consumption, high blood pressure, high cholesterol, and obesity. A disturbing finding from this report was the conclusion that the world is living more dangerously than ever before. In regard to health, this is because the poor have few choices in their lives, and those not limited by poverty who do have choices make the wrong choices concerning their health behaviors and activities.

Future Implications

Measuring and understanding the determinants of morbidity are key to ensuring the health and vitality of a population. As the leading causes of morbidity and mortality in developed countries shift from infectious to chronic diseases, appropriate health planning must be undertaken. Additionally, in developing countries, the urgent need to stem the rise in infectious diseases is paramount to decrease the burden of morbidity and improve the quality of life.

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See also Acute and Chronic Diseases; Centers for Disease Control and Prevention (CDC); Disease; Emerging Diseases; Epidemiology; Infectious Diseases; Mortality; Quality-Adjusted Life Years (QALYs)

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- World Health Organization (WHO): <http://www.who.int>

MORTALITY

Mortality is simply defined as death, and it is the end result of life. A *mortality rate* is the proportion of deaths in a given place over a specified period of time. The numerator includes the number of persons who died in a given geographic area over a period of time, and the denominator is the total population in the same geographic area. The mortality rate is generally reported as a proportion of deaths per 1,000, 10,000, or 100,000 individuals. In health services research, mortality rates are often used as general indicators of the health and well-being of groups and populations.

Overview

Mortality rates are based on death data that come from *vital statistics registries*. Vital statistics include all the prominent life events: births, marriages, divorces, and deaths. The registration of all these life events is required in the United States, and state health departments compile vital statistics summaries on deaths. The primary source of death information in the United States is the standardized death certificate, which is kept by individual state health departments and is completed by physicians or coroners at the local level. The major components of the death certificate include personal identifiers, demographic information, and the manner and cause of death.

Mortality Rates and Ratios

There are many types of mortality rates and ratios, for example, the *crude mortality rate*,

age-standardized mortality rate, disease-specific mortality rate, and infant mortality rate. Each type of mortality rate and ratio has its specific uses and limitations. The following are the most common types of mortality rates.

The Crude Mortality Rate

A crude mortality rate represents a rough estimate of mortality and is seldom used because it does not take into account the variations in a group's or population's age composition. The crude mortality rate is calculated by taking the total number of deaths during a 1-year period divided by the total population midyear for a specified geographic area. The rate is usually presented as deaths per 100,000 individuals. Crude mortality rates can sometimes be misleading. For example, a developed country may have a higher crude mortality rate than a developing country because of the increased number of elderly who may die in a given year. Therefore, mortality rates generally should be standardized to reflect this difference in population characteristics.

The Age-Standardized Mortality Rate

An age-standardized mortality rate is determined by taking the number of deaths in a specific age cohort occurring during 1 year divided by the midyear population of the specific age cohort. The derived rate is usually presented in terms of deaths per 1,000 or 100,000 individuals. Age-specific rates are refinements on the crude mortality rates. Note that, in putting a limitation on age, the same restriction must be applied to both the numerator and denominator, so that every individual in the denominator group will be at risk for entering the numerator group.

The Disease-Specific Mortality Rate

The disease-specific mortality rate is specified for a certain disease, such as tuberculosis or HIV/AIDS. The numerator in this rate is the number of deaths from a specific cause or disease and the denominator is the total population at midyear. Again, these rates are usually expressed in terms of annual mortality figures from a specific cause per 1,000 or 100,000 individuals.

The Case Fatality Rate

The case fatality rate is a measure of how severe a disease is and is usually reported as a percentage. The case fatality rate is calculated by taking the number of deaths from a specific cause after the onset of the disease (i.e., after diagnosis) during a specified period of time divided by the number of cases of the disease, multiplied by 100. This "rate" illustrates the percentage of individuals who die from a specified disease within a certain time after diagnosis.

The Proportional Mortality Ratio (PMR)

The PMR is a measure of the proportion of deaths from a specific disease compared with all deaths. The PMR is calculated by taking the total number of deaths from a certain disease over a specified period of time divided by the total number of deaths from all causes in the identical period of time. The PMR does not measure the risk of dying from a specific disease: The proportions change as a result of increases or decreases in the mortality rates of other diseases.

The Maternal Mortality Rate

The maternal mortality rate is calculated by dividing the number of deaths from childbearing causes during 1 year over the total number of live births during the identical year. This proportion is usually reported as deaths per 100,000. The maternal mortality rate measures the number of mothers who die giving birth.

The Infant Mortality Rate

The infant mortality rate is an overall measure of infant deaths. The numerator for this death rate is the number of children under the age of 1 who die over a 1-year period, and the denominator is the total number of live births during the same year. The result is typically multiplied by 1,000 to calculate a rate of infant deaths.

The Perinatal Mortality Rate

The perinatal mortality rate measures the number of infant deaths occurring around the period of

birth. The perinatal mortality rate is calculated by taking the number of fetal deaths and the number of infants under 1 week of age who die during a period of a year divided by the total number of live births plus the total number of fetal deaths in the same year. This rate is typically expressed as deaths per 1,000.

The Neonatal Mortality Rate

The neonatal mortality rate is calculated by dividing the total number of children under 28 days old who die during a particular year by the number of live births during the same year. This rate is usually multiplied by a factor of 1,000.

The Fetal Mortality Rate

The fetal mortality rate is calculated by dividing the number of fetal (unborn infant) deaths during a particular year by the total number of live births plus fetal deaths during the identical year. This rate is usually multiplied by a factor of 1,000.

The Standardized Mortality Ratio (SMR)

The SMR is used to examine the differences in death rates between what is observed and what is expected. It is calculated by dividing the number of individuals who die per year by the number of individuals expected to die during the same year multiplied by 100. An SMR of less than 100 indicates that the observed deaths are less than what is expected, a value of 100 shows that the number of expected deaths is equal to the number of observed deaths, and an SMR of more than 100 demonstrates that observed deaths are greater than what is expected.

The Years of Potential Life Lost (YPLL)

The YPLL is a mortality index that has been used increasingly in recent years. It indicates the number of "years lost" as a result of an early death. It is calculated by first subtracting an individual's age at death from a standard age of life expectancy (generally, 65 years old). The smaller the subtrahend, the larger is the number of years of potential life lost. This calculation yields the YPLL for one individual. To calculate YPLL for the

entire population, the YPLLs for all individuals are added together for a specific cause of death. YPLLs can be used to compare the causes of premature deaths.

Sources of Mortality Data

There are several sources of mortality data that are available to health services researchers. Information from death certificates is aggregated in comprehensive mortality databases and is reported by various federal agencies. Data may also be collected by agencies at the time of death for the purposes of issuing survivor benefits. Researchers may need this information on mortality and the cause of death to calculate a variety of mortality rates, to assess survival rates for a disease of interest, or to verify deaths in a multisite clinical trial.

The Morbidity and Mortality Weekly Report (MMWR)

The MMWR is published weekly by the U.S. Centers for Disease Control and Prevention (CDC). This publication originated from the National Quarantine Act, passed by the U.S. Congress in 1878, requiring American Consuls to file reports on conditions abroad and on vessels bound for U.S. ports. From these reports, the surgeon general of the U.S. Public Health Service (PHS) prepared weekly abstracts for transmission to PHS officers, collectors of customs, and state and local health authorities. The format, content, and sponsoring government agencies have changed over the years until, in 1961, the CDC published its first issue of MMWR. The MMWR is the only regular weekly periodical published in the United States that documents morbidity from all 50 states and 5 territories and mortality from 121 cities that represent one third of the nation's population.

The National Death Index (NDI)

The NDI was created in 1981 by the National Center for Health Statistics (NCHS) in response to a growing need for a national source of mortality data. The NDI is compiled from death certificate data received from all 50 state health departments. It is particularly useful to verify large numbers of

deaths. The NDI is considered to be the gold standard of death databases; however, it is available only to researchers in medical and health sciences research for statistical purposes. There is a cost associated with the NDI data and suitable projects must be approved by NCHS, which necessitates additional time as the review and approval of projects may take several months.

The Death Master File (DMF)

The DMF is compiled and maintained by the U.S. Social Security Administration (SSA) and is only one of several mortality databases available to the public: For small studies, where the verification of only a few deaths is necessary, Web searches may be quickly and easily completed at no cost. SSA data depend on an individual having a Social Security number, and the death must have been reported to the SSA. The DMF contains only basic information on each decedent. However, once the verification of death has been confirmed, researchers can then procure the death certificates from the appropriate state agencies. The cause of death information also can be acquired from the SSA.

The Beneficiary Identification and Records Locator Subsystem (BIRLS)

The BIRLS is a death database maintained by the U.S. Department of Veterans Affairs (VA). This database was created in the 1970s as an update to a manual system designed to collect information for veterans' benefit programs. The majority of BIRLS records are of veterans whose survivors applied for death benefits. The inclusion of a veteran's death record depends on the submission of a copy of the individual's death certificate to the VA. This database has two major limitations: First, it only contains data on U.S. veterans, and second, it is only available to VA researchers.

The World Health Organization (WHO) Mortality Statistics

The WHO statistics include mortality information from WHO member states around the globe. WHO collects and distributes data on (a) mortality,

(b) estimates on causes of deaths and the global burden of disease, and (c) statistics on life expectancy. Mortality rates can be compared and contrasted across nations as much of the WHO data collected are universally standardized. For example, the cause of death information is reported for all countries using International Classification of Diseases (ICD) codes.

Future Implications

Mortality data play an important role in health services research studies because it provides a general indication of a population's health as well as the trends and patterns in the leading causes of death. As the demographics of populations shift, mortality data will continue to be used to examine the demand and need for specific healthcare services. Mortality rates are also used as one measure of the quality of care provided by healthcare institutions and systems.

Joseph D. Kubal

See also Centers for Disease Control and Prevention (CDC); Disease; Epidemiology; Health; Morbidity; Mortality, Major Causes in the United States; Public Health; Quality of Healthcare; World Health Organization (WHO)

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MORTALITY, MAJOR CAUSES IN THE UNITED STATES

For decades, heart disease, cancer, and stroke have been the top three leading causes of death in the United States. Deaths from heart disease, cancer, and stroke together account for almost 60% of all deaths in the nation. The prevalence of these three major diseases has important implications for the delivery, organization, and exploitation of healthcare services. It also guides public health policy and programmatic efforts at the national, state, and local levels. Mortality trends, risk factors, and the prevention of each disease are discussed below.

Heart Disease

Heart disease is the leading cause of mortality in the United States with about 700,000 deaths occurring annually, accounting for approximately 29% of all deaths in the nation. Heart disease, also known as cardiovascular disease, encompasses a number of abnormal conditions, including coronary heart disease (CHD) and hypertension (high blood pressure), that affect the heart and its blood vessels. CHD is the most common type; it leads to hardening and narrowing of the arteries, making it harder for blood to reach the heart. It can lead to angina (chest pain or discomfort), myocardial infarction (heart attack), congestive heart failure, or arrhythmia (abnormal heart beat).

Mortality Trends

Mortality rates for CHD rose in the United States during the period from 1949 to 1967 and have been declining since, particularly for acute myocardial infarction and chronic ischemic heart

disease (CIHD). Death rates decreased steadily from 1968 to 1981, but the decrease has begun to slow. An increasing number of people survive their first heart attack.

The mortality declines have been attributed to prevention efforts as well as to improvements in medical care. There have been substantial decreases in the prevalence of some of the major cardiovascular risk factors such as smoking, elevated total cholesterol, and high blood pressure. Advances in medicine have led to a revolution in the treatments for established heart disease, with major breakthroughs in evidence-based medical and surgical techniques, including the use of coronary artery bypass grafting, coronary angioplasty, and stents. Despite overall declining trends, heart disease mortality is still a disparate burden on minority populations.

Risk Factors

Extensive research has identified both the major and contributing risk factors associated with an increased risk of developing CHD, but their exact significance and prevalence have not been precisely determined. Some of these risk factors are modifiable, whereas others are not. The risk of developing CHD is directly proportional to a person's number of risk factors as well as to the level of each risk factor.

Major nonmodifiable CHD risk factors include age, male gender, and heredity, including race. The children of parents with heart disease are more likely to develop the disease. African Americans, who tend to have more severe high blood pressure than Whites, have a higher risk of heart disease. The risk of heart disease is also higher among Mexican Americans, American Indians, native Hawaiians, and some Asian Americans than among Whites. Major modifiable risk factors include smoking, high blood cholesterol, high blood pressure, physical inactivity, obesity and being overweight, and having diabetes mellitus. Additional factors contributing to CHD risk include stress and excessive alcohol intake.

Prevention

Taking steps to prevent and control the known risk factors can reduce the occurrence of CHD.

Additionally, knowing the signs and symptoms of a heart attack, calling for emergency medical services, and immediately going to a hospital are crucial to positive outcomes. People who have had a heart attack can also work to reduce their risk of future attacks.

Despite our greater understanding of the risk factors of CHD, the prevalence of both obesity and diabetes in the U.S. population has increased over the past 25 years, with approximately 34% of adults aged 20 and over being obese. The rising prevalence of obesity and diabetes may reverse the decline in CHD-related deaths. Aggressive public health programs to control these risk factors are urgently needed.

Cancer

Cancer is the second leading cause of mortality in the United States with about 500,000 deaths occurring annually, accounting for approximately 23% of all deaths. Cancers, also called *malignant neoplasms*, include a large group of diseases in which abnormal cells divide without control and can invade healthy body tissues. Cancer cells can spread to other parts of the body through the blood and lymph systems. There are more than 100 different types of cancer. Lung cancer is the most common cause of cancer-related deaths in the United States for both men and women, resulting in approximately 157,000 deaths each year. Among men, prostate cancer mortality is second, followed by colon and rectum cancer. In women, lung cancer, breast cancer, and colon and rectum cancer are the leading types of fatal cancers. Among women, breast cancer is the most common cancer and the second most common cause of cancer death, with approximately 40,000 deaths per year.

Mortality Trends

Whereas the rates for other major chronic diseases have decreased substantially since 1950, cancer-related death rates showed a steady increase until the 1990s. The death rate from all cancers combined has decreased by 1.6% per year since 1993 for men and 0.8% per year since 1992 for women. The first decline in the number of cancer

deaths occurred in 2003, when there were 369 fewer cancer-related deaths than in 2002. From 2003 to 2004, the number of recorded cancer deaths decreased by 1,160 in men and by 1,854 in women. Compared with the peak rates in 1990 for men and 1991 for women, the cancer death rate in 2003 was 16.3% lower for men and 8.5% lower for women.

Among men, most of the increase in cancer death rates prior to 1990 was attributable to lung cancer. Since 1990, the age-adjusted lung cancer death rate in men has been decreasing. Death rates from prostate and colorectal cancers have also decreased. Among women, lung cancer is currently the most common cause of cancer death, with the death rate more than twice what it was 25 years ago. Breast cancer death rates were constant from 1930 to 1990 but have since decreased by about 24%. The death rates for stomach and uterine cancers have decreased steadily since 1930; colorectal cancer death rates have been decreasing for more than 50 years.

Overall, *cancer incidence rates* are higher in men than in women. Among men, African Americans have the highest incidence followed by Whites, Hispanics, Asian Americans/Pacific Islanders, and American Indians/Alaskan Natives. Racial differences in cancer incidence among women are less pronounced; White women have the highest incidence rates followed by African Americans, Hispanics, American Indians/Alaskan Natives, and Asian Americans/Pacific Islanders.

Overall, *cancer death rates* are higher for men than for women in every racial and ethnic group. African American men and women have the highest rates of cancer mortality. Death rates for myeloma and cancers of the prostate, larynx, stomach, oral cavity, esophagus, liver, small intestine, colon and rectum, lung and bronchus, and pancreas are all higher in African American men than in White men. Death rates for African American women are also higher than for White women for myeloma and cancers of the stomach, cervix, esophagus, larynx, uterus, small intestine, pancreas, colon and rectum, liver, breast, urinary bladder, gallbladder, and oral cavity. Although cancer death rates are higher in African American men and women than for their White counterparts, the cancer death rate is declining faster for African Americans than for Whites.

Risk Factors

A number of cancer risk factors have been identified, including increasing age, family history of cancer, environmental factors, and lifestyle factors. As with heart disease, some of the risk factors are modifiable and others are not. Perhaps the most recognized and preventable cancer risk factor is tobacco use. Research clearly indicates that tobacco use is a major cause of cancer-related deaths. It has been estimated that cigarette smoking accounts for 85% of all lung cancers in smokers. Another risk factor is postmenopausal obesity, which is associated with breast cancer due to the conversion of adipose tissue to estrogen. A lack of vitamins B and D may also be a risk factor for breast, prostate, and colon cancers.

Prevention

To lower the risk of developing cancer, the American Cancer Society recommends (a) avoiding tobacco products, (b) consuming a diet rich in fruits and vegetables and low in saturated fats, and (c) exercising moderately and maintaining a healthy weight. Specifically, the society recommends eating five or more serving of fruits and vegetables a day, which may protect against cancers of the mouth and pharynx, esophagus, lung, stomach, and colon and rectum. It recommends that adults engage in at least moderate physical activity for 30 minutes or more on 5 or more days a week.

Stroke

Stroke is the third leading cause of mortality in the United States; about 160,000 stroke deaths occur annually, accounting for approximately 7% of all deaths. Stroke, sometimes referred to by the older term *cerebrovascular accident* (CVA), occurs due to interrupted blood flow to an area of the brain. This may be caused by an arterial blockage or rupture. Hence, stroke is classified into two major types: ischemic (blockage) or hemorrhagic (rupture). *Ischemic stroke* can occur due to thrombosis, embolism, or systemic hypoperfusion. *Hemorrhagic stroke* can result from intracerebral hemorrhage or subarachnoid hemorrhage. Approximately 80% of strokes are due to ischemic cerebral infarction and 20% to brain hemorrhage. A transient

ischemic attack (TIA) is defined clinically by the temporary nature of the associated neurological symptoms, which last less than 24 hours by the classic definition. Recognition of a TIA is crucial because it is an important predictor of future ischemic events.

Regardless of the cause, an interrupted blood supply to the brain results in cell damage and neurological injury. Consequently, functions controlled by the affected area of the brain, such as speech, movement, and memory, may be lost. The outcome depends on the location and extent of the brain area damaged. A small stroke may result in only minor problems such as weakness of an arm or leg. Larger strokes may result in paralysis on one side of the body or loss of the ability to speak. Some people suffer transient loss of function and recover completely from strokes. More than two thirds of survivors, however, experience some type of residual disability as well as emotional problems.

Strokes can occur at any age. However, the risk of having a stroke more than doubles for each decade a person lives beyond the age of 55. Nearly 75% of all strokes occur in people over the age of 65. Stroke death rates are higher for African Americans than for Whites, even at younger ages.

Mortality Trends

Overall, stroke mortality declined steadily from 1950 through the mid-1970s, then increased. During 1979 to 1989, stroke mortality declined one third more rapidly than the other 10 leading causes of death. Recent data, however, suggest that there is a slowing of the decline in stroke mortality rates. For the period 1968 to 2005, the decrease in stroke mortality rates appears to be due to improving survival rates rather than from a decline in the incidence of stroke.

The constant morbidity rates combined with constant rates of high blood pressure highlight the need for improved prevention to reduce the number of strokes. For several decades, the southeastern United States has had the highest stroke mortality rate in the nation and has been described as the "stroke belt." It is not clear what factor or factors contribute to the higher incidence and mortality from stroke in this region.

Risk Factors

Some of the risk factors for stroke are non-modifiable, such as age, gender, and race. The risk of stroke increases with age. Males are more susceptible overall to having a stroke, but women aged 35 to 44 are also susceptible—possibly due to pregnancy and oral contraceptive use—as are women over age 85. One's family history, environment, and lifestyle also influence the risk of having a stroke.

Modifiable risk factors for stroke include high blood pressure, smoking, diabetes, asymptomatic carotid stenosis, atrial fibrillation, and hyperlipidemia. Blood pressure, especially systolic blood pressure, increases with age. Isolated high systolic blood pressure (more than 160 mmHg) is an important risk factor for stroke in the elderly. Smoking causes reduced blood vessel distensibility leading to increased arterial wall stiffness. Smoking is also associated with increased fibrinogen levels, increased platelet aggregation, decreased high-density lipoprotein (HDL) cholesterol levels, and increased hematocrit. Diabetes is a risk factor for atherogenesis and leads to obesity, high blood pressure, and hypercholesterolemia. Hyperlipidemia also contributes to atherogenesis and, hence, stroke. In older persons, congestive heart failure is an important risk factor for stroke. Other factors that may be risk factors for stroke include obesity, physical inactivity, poor nutrition, alcohol abuse, drug abuse, sickle-cell anemia, hormone replacement therapy, and oral contraceptive use.

Prevention

To prevent the occurrence of stroke, regular adult screening for high blood pressure at least every 2 years is recommended for appropriate management, evaluation, and treatment. Appropriate control of high blood pressure for patients with Type 1 or 2 diabetes significantly reduces their incidence of stroke, whereas blood glucose control has been proven to be less effective. The long-term use of anticoagulants such as aspirin and warfarin, especially for individuals with atrial fibrillation, has been shown to decrease stroke mortality. Patients with coronary disease and hyperlipidemia should be managed with statins to lower the risk of stroke. Last, patients who smoke should be encouraged to stop.

Intersecting Risk and Prevention Pathways

Although heart disease, cancer, and stroke are separate diseases, they have many overlapping risk factors and prevention pathways. Obesity, physical inactivity, and tobacco use as well as high blood cholesterol, high blood pressure, and diabetes are risk factors for heart disease, some cancers, and stroke. For example, cigarette smokers are more likely to develop heart disease than are non-smokers, smokers have a much higher incidence of lung cancer than nonsmokers, and smoking approximately doubles a person's risk for stroke.

Responding to public health campaigns, millions of Americans have changed their eating habits, reducing saturated fat in their diets and lowering their serum cholesterol levels. Fewer adults are smoking cigarettes. More people with hypertension are being treated to control their high blood pressure. And millions of people exercise during their leisure time. These changes in lifestyle have significantly contributed to the decline in heart disease, cancer, and stroke deaths. At the same time, however, a large number of people continue to be physically inactive and are overeating, gaining weight, and becoming obese. In addition, these three diseases may all occur at any age from childhood to adulthood. And many adolescents and teenagers are engaging in unhealthy behaviors such as smoking.

Further reducing major risk factors such as high blood pressure, high blood cholesterol, tobacco use, diabetes, physical inactivity, and poor nutrition could eliminate much of the incidence of heart disease and stroke as well as some cancers. Determining effective prevention measures and therapy is increasingly important for both understanding past disease trends and planning future preventive and therapeutic strategies.

Memoona Hasnain and Grace Male

See also Cancer Care; Disease; Epidemiology; International Classification of Diseases (ICD); Life Expectancy; Mortality; Preventive Care; Public Health

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- National Center for Health Statistics (NCHS): <http://www.cdc.gov/nchs>
- National Heart, Lung, and Blood Institute (NHLBI): <http://www.nhlbi.nih.gov>
- National Institute of Neurological Disorders and Stroke (NINDS): <http://www.ninds.nih.gov>
- National Stroke Association: <http://www.stroke.org>

MULTIHOSPITAL HEALTHCARE SYSTEMS

Multihospital healthcare systems are defined as two or more hospitals owned, leased, sponsored, or contract managed by a central organization. They are also sometimes referred to as *hospital chains*. In 2006, the American Hospital Association (AHA) reported a total of 369 multihospital healthcare systems in the United States. These systems contained 2,755 hospitals, nearly 56% of all

U.S. hospitals. The vast majority of the systems, 299, or 81%, were not for profit. Of the remaining systems, 65 were investor-owned (for-profit) and 5 were government-owned organizations.

Horizontally and Vertically Integrated Systems

Multihospital healthcare systems are often differentiated as being either horizontally integrated or vertically integrated systems. The term *horizontally integrated system* refers to groups of similar organizations providing similar services (e.g., two or more community hospitals). The primary goal of developing a horizontally integrated system is generally to capture the market for a particular service within a specific geographic location. These types of multihospital systems tend to be in close geographic proximity to one another. *Vertically integrated systems* attempt to link different levels of healthcare services (e.g., primary care, acute care, and postacute care) together to move toward providing full service delivery. Such multihospital systems may include the ownership of managed-care organizations, for example, that can serve as feeders to the inpatient facilities. This type of multihospital system can be dispersed across a wide geographic area (e.g., in different states). Most multihospital healthcare systems in the United States are vertically integrated.

Reasons for System Integration

There are a number of reasons cited regarding the benefits—to an autonomous, freestanding hospital—of joining a multihospital healthcare system. One of the primary goals of integrating into multihospital systems is to achieve economies of scale and scope in delivering healthcare. In theory, when hospitals integrate into a system, they can take advantage of significant cost savings in organizational operation. These economies can be achieved in a variety of ways. First, multihospital systems may be able to reduce costs by receiving volume discounts on the purchase of services and supplies. Second, equipment and service costs can be reduced by eliminating overlap and duplication. Third, administration costs can be reduced by centralizing functions such as marketing, legal, human resource management, and planning.

A second perceived benefit of systems integration is the spreading of financial risk. In theory, members of multihospital systems are better able to absorb the financial impact of a turbulent healthcare environment than are freestanding hospitals.

Third, multihospital systems help hospitals provide better-coordinated patient care. In a vertically integrated system, for example, it may be possible to provide a full array of patient care services without having to refer the patient to an outside provider. Such a system can provide the continuum of care from primary care through inpatient care to postacute or long-term care.

A fourth factor cited as being a benefit of integration is increased administrative efficiency. By centralizing many administrative functions, it is possible to standardize many processes, including planning, marketing, human resource management, and quality improvement strategies.

Finally, all the benefits listed above can be enhanced through the development of an integrated, systemwide information system. The ability to have current, accurate information on all phases of the system's operation enhances its ability to both respond and be proactive to enhance success.

The empirical evidence on whether such benefits have actually been achieved is not clear. Although some multihospital systems report reductions in operational costs, in general, such claims of gains seem exaggerated. The most recent data available indicate, for example, that the average total cost per occupied hospital bed is higher in multihospital systems than in autonomous freestanding hospitals. Vertically integrated systems owning managed-care organizations do seem to have lower costs than systems without such ownership. This may indicate that a useful gatekeeper function is being performed by the systems' health maintenance organizations (HMOs).

The Veterans Administration

One of the largest vertically integrated multihospital systems in the nation is operated by the Veterans Administration (VA). Its mission is to provide a full array of healthcare services to U.S. military veterans. The veterans healthcare system is headed by the undersecretary of health and is

funded by federal tax dollars. The fiscal year 2008 budget for the Veterans Health Administration (VHA), which runs hospitals and other health facilities, was in excess of \$36 billion, which represents more than 40% of the VA's total annual budget. The VHA operates 153 medical centers and 724 community-based outpatient centers across the nation and employs more than a quarter of a million people.

The operation of the VA as a system is one example of successful integration. According to Phillip Longman, VA hospitals have moved from being some of the worst healthcare providers in the nation to some of the very best. The benefits derived from running the VA with systemwide standards of care, safety, and quality improvement have been substantial and have occurred in a relatively short time frame.

Future Implications

The general trend in the percentages of hospitals integrated into multihospital healthcare systems—over the 5 most recent years for which AHA data are available—indicates an increase. The percentage of hospitals in systems has risen from less than 46% to nearly 55% between 2001 and 2005.

Although the evidence is mixed on whether multihospital healthcare systems deliver the potential benefits noted earlier, it is apparent that they offer some advantages. As the healthcare environment continues to remain turbulent, autonomous freestanding hospitals will feel pressure to band together with other institutions to ensure their survival.

Ralph Bell

See also American Hospital Association (AHA); Competition in Healthcare; Healthcare Financial Management; Healthcare Markets; Healthcare Organization Theory; Health Economics; Hospitals; U.S. Department of Veterans Affairs (VA)

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<http://www.americanhospitals.com>
- Healthcare Financial Management Association (HFMA):
<http://www.hfma.org>
- U.S. Department of Veterans Affairs (VA):
<http://www.va.gov>

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NATIONAL ALLIANCE FOR THE MENTALLY ILL (NAMI)

Founded in 1979 by family members of seriously compromised mental health consumers in Wisconsin, the National Alliance for the Mentally Ill (NAMI) is one of the nation's largest grassroots health organizations. With a national office in Arlington, Virginia, and state-based organizations in all 50 states, NAMI is well connected to communities across the country. NAMI organizations and their supporters strive not only to improve the quality of life of those who suffer from mental illness but also to eliminate mental illness all together. Although NAMI started out with the purpose of supporting consumers of mental healthcare, it now also supports family members of those who have mental illness. NAMI supporters include a variety of community leaders, educators, healthcare providers, researchers, advocates, and families. The organization is open to all who are interested in membership.

Education and Training

Education and training opportunities through NAMI are targeted to four major audiences: consumers, families and caregivers, the general public, and providers. Consumer education includes multimedia presentations, a NAMI support group, and the Peer-to-Peer program, which offers individualized information.

Education for families is delivered through the Family-to-Family program, which provides education for family members of those with mental illness and a multimedia presentation, *Hearts and Minds*, which aims to decrease heart disease among mental health consumers.

Trained consumers prepare and present programs for the general public to community groups through an educational speakers' bureau that demonstrates recovery and provides accurate education about mental illness. The general efforts include the multimedia presentation *In Our Own Voice*. Parents and Teachers as Allies is a program specific to educators that is provided by teachers who are trained mental health consumers and family members.

Education for providers includes the NAMI Provider Education course, taught by consumers, consumers' family members, and mental health professionals, which offers 10 weeks of training for mental health providers.

Advocacy Functions

NAMI's initial purpose was to protect the most disabled mentally ill individuals who could not advocate for themselves. Rather than focus solely on the patient, NAMI encourages a partnership between healthcare teams, consumers, and their families. Today, NAMI is advised by the Consumer Council and provides numerous avenues for consumer support.

The NAMI on Campus initiative provides student-led support to fellow students who either have mental illness or are affected by it in another

way. Services include education for students, faculty, and college administrations; advocacy for students with mental illnesses; and promotion of early detection and treatment. Efforts to counter the effects of stigma against mental illness are of equal importance.

NAMI's Multicultural Action Center (MAC) was created in response to reports by the Surgeon General and the national Institute of Medicine (IOM) regarding the extreme toll that lack of quality treatment for mental health has taken on our country. The center seeks to secure culturally sensitive access to mental health services for all persons and their families, especially people of color, who are disproportionately represented among consumers who receive low-quality mental health services or none at all. Current priorities regarding policy changes for the center include health disparities; culturally competent services, including proper language fit between providers and consumers; research, particularly in the area of genetics, children and adolescents with mental illness, and depression; and the overrepresentation of mental illness in correctional systems. In connection with the group's Support Technical Assistance Resource (STAR) Center, MAC produces a newsletter called *Recovery for All*.

NAMI also conducts educational courses for consumers and families, including the Peer-to-Peer course for consumers, the NAMI-CARE (Consumers Advocating Recovery Through Empowerment) Mutual Support Program, and the *Hearts and Minds* multimedia program. It offers resources such as the NAMI Information Help Line and online communities for discussion of common interests. The Child and Adolescent Action Center provides discussion groups for teen consumers as well as for parents and caregivers of children and adolescents.

Internet Resources

Other services provided over the Internet include the following: legal support and guidance for consumers; resources for providers; mental health news and pertinent research updates; legislative alerts and updates; and FaithNet, a Web site representing the partnership between the faith community and NAMI.

Initiatives

Many public awareness initiatives are spearheaded by NAMI. Mental Illness Awareness Week, held during the 1st week of October, is intended to raise public awareness about the myths of mental illness and the benefits of treatment. NAMI Campaign for the Mind of America is a political initiative designed to create relationships at the local, state, and federal levels of government. These relationships are meant to promote policies that advance mental health through economic and scientific systems.

NAMI Action Centers focus on the specific needs of unique groups such as children and adolescents, multicultural populations, and clients of the criminal justice system. These action centers work to develop and promote education, advocacy, and research among these particular groups.

Policy Research

Mental healthcare policy is a priority for NAMI and is highlighted through specific areas of interest, including integration of consumers and family members in development of mental health services in all settings, equitable access to the most current and complete mental healthcare interventions, and insurance coverage for mental health services. The research activities and awareness initiatives supported by NAMI focus on positive policy change.

Publications

NAMI produces several publications for its members, including the quarterly *The Advocate*. It also provides many specialty publications that address the multifaceted needs of its members. The NAMI Child and Adolescent Action Center publishes *NAMI Beginnings*. And *Recovery for All* is published in connection with the STAR Center and MAC.

Events

NAMI hosts a series of annual *NAMI Walks* held at multiple sites with the purpose of raising funds and awareness of treatment needs of mental health consumers; in 2007, more than 69 walks were

held throughout the country. Another large fundraiser is the annual Washington, D.C., black tie affair, *Unmasking Mental Illness Science and Research Gala*, which helps to raise money for research efforts focused on identifying the etiology and treatment of mental illness.

Future Implications

NAMI remains committed to improving the lives of individuals suffering from mental illness as well as their families and communities. Through outreach, support, education, and research efforts, NAMI can help increase understanding of mental health and promote policy changes that affect this area.

Della Derscheid

See also Access to Healthcare; Community Mental Health Centers (CMHCs); *Diagnostic and Statistical Manual of Mental Disorders (DSM)*; Medical Sociology; Mental Health; Mental Health Epidemiology; Substance Abuse and Mental Health Services Administration (SAMHSA)

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- Substance Abuse and Mental Health Services Administration (SAMHSA): <http://www.samhsa.gov>

NATIONAL ASSOCIATION OF HEALTH DATA ORGANIZATIONS (NAHDO)

The National Association of Health Data Organizations (NAHDO) is a national, nonprofit membership and educational association established to promote the uniformity and public availability of health data to inform healthcare cost, quality, and access decisions. Based in Salt Lake City, Utah, the association brings together the public and private sectors of the health information industry to improve and facilitate the collection and use of healthcare data for diverse audiences and applications.

Background

The Washington Business Group on Health (WBGH)—now the National Business Group on Health (NBGH)—and the Intergovernmental Health Policy Project (IHPP) at George Washington University established NAHDO in the spring of 1986. Representatives from state health data organizations in Arizona, Colorado, Iowa, Maryland, New Hampshire, New Jersey, and Tennessee met with WBGH and IHPP in Washington, D.C., to launch NAHDO. Shortly thereafter, the new association became a private, not-for-profit, national, educational membership organization.

In 1989, NAHDO's board of directors broadened the membership qualifications to include organizations and individuals from both the private for-profit and the not-for-profit sectors. Today, the association's membership includes state health data organizations, federal agencies, peer review organizations, software and hardware vendors, consulting groups, universities, representatives from state and regional hospital associations, managed-care organizations, health services research organizations, and the media.

NAHDO is governed by a board of directors representing states, healthcare organizations, corporations, and payers. The organization is funded through membership dues, meeting revenues, and grants. NAHDO's staff, the board of directors, and its members work as a community of professionals

to overcome the political and technical challenges to healthcare transparency and performance reporting. Some segments of the healthcare industry still resist independent, objective public reporting on quality and cost. The association works with its members and other allies to improve the underlying data sources and promote consumers' use of the data.

Functions

NAHDO monitors the data collection and release policies of state and private health data organizations. Members and reporting data agencies and their national and local stakeholders use this information for planning purposes. The association also uses this information to advocate sustainable funding for statewide health data systems and to advise states about best practices in data collection and dissemination. The group provides technical assistance and guidance to states to establish statewide health data hospital inpatient and emergency department reporting systems, facility-based ambulatory-surgery reporting systems, health maintenance organizations, and health plan performance measurement systems, and recently, the group began to facilitate the establishment of all-payer, all-claims reporting systems for commercial and public health plans. The association also provides technical assistance to health data agencies to produce data products and comparative reports, including consumer quality reports and Web sites.

Partnerships

NAHDO is a leader in promoting and implementing national standards that support public health and quality reporting purposes. NAHDO's National Standards Consultant is a voting member of the National Uniform Billing Committee (NUBC), which maintains hospital content standards under the Health Insurance Portability and Accountability Act of 1996 (HIPAA), and a voting member of the American National Standards Institute X12N and Health Level 7 (HL7), both data standards maintenance organizations. NAHDO actively worked to add standard data fields to the core uniform billing standard (Uniform Bill 04), such as a "present-on-admission indicator" for each

diagnosis and a standard race and ethnicity standard for electronic hospital transactions. The association and its standards consultant have produced the *Health Data Reporting Guide* for the national X12N standards for inpatient hospital encounters to be used by state agencies.

NAHDO represents state health data system interests in national forums, including the National Quality Forum (NQF), to promote measures that are relevant for state and public health agencies and provides testimony and comment to federal agencies and national entities, including the National Committee on Vital and Health Statistics. The association is a leader in the implementation of Web-based data query systems, and it provides technical assistance to states implementing Web-based reporting and promotes data dissemination policies that support interactive, dynamic Web-based data release. It also works with its members, state data system stewards, to make healthcare data available for public health programs and surveillance.

Activities and Meetings

NAHDO has convened annual meetings of its members for more than 20 years, and it conducts special regional and topical workshops as well as online conferences called webinars. These meetings and webinars facilitate state-to-state information sharing and transfer of knowledge. The association's technical expertise also includes discussion forums, Listservs, and newsletters. Like most membership-based associations, NAHDO's success is directly linked to its members' involvement, expertise, and commitment to its mission.

Denise Love

See also Benchmarking; Data Privacy; Data Security; Data Sources in Conducting Health Services Research; Healthcare Cost and Utilization Project (HCUP); Health Informatics; Health Insurance Portability and Accountability Act of 1996 (HIPAA); Quality of Healthcare

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<http://www.naphsis.org>

National Committee on Vital and Health Statistics (NCVHS): <http://www.ncvhs.hhs.gov>

NATIONAL ASSOCIATION OF STATE MEDICAID DIRECTORS (NASMD)

The National Association of State Medicaid Directors (NASMD) is a professional and bipartisan nonprofit organization composed of officials from Medicaid programs in the 50 states, the District of Columbia, and the U.S. territories. It is one of the nine affiliate organizations under the American Public Human Services Association (APHSA). Its focus is on improving the health and well-being of adults, children, and families by advocating for effective public human service policies. The NASMD, whose members include state directors and their senior staff, has operated as a focal point for communication between state programs and the federal government since 1979. It also works to provide an information network for the states on pertinent Medicaid policy and program issues. Its efforts help inform and influence legislative policy, federal and state regulations, health information technology, and Medicaid reform. The key issues addressed by the NASMD include the following: citizenship requirements, coordination of benefits, long-term care, and prescription drug coverage.

Organizational Structure

The structure of the NASMD includes a 12-member Executive Committee. In addition to a chair, vice chair, cochair, and immediate past chair, representatives from four geographic regions and the U.S. territories serve on this committee. Two members from each region—the Midwest, West, Northeast, and South—sit on the committee; whereas the U.S. territories have a single member. This group oversees administrative matters for the association, represents the NASMD in meetings with the Centers for Medicare and Medicaid Services (CMS), offers testimony before the U.S. Congress when appropriate, and provides overall policy guidance for the association.

Technical Advisory Groups

The association also has several Technical Advisory Groups (TAGs). These work groups are a joint effort of state programs and the CMS. They get together to discuss issues that may arise from Medicaid programs and operations. TAGs do not set policy; rather, they serve as a sounding board to develop strategies surrounding technical or operational concerns. If the TAG determines that the issue being dealt with might have significant policy implications, group members will defer to the Executive Committee or the full NASMD for consideration. TAG members communicate strategies and solutions to the states in their region, helping provide the necessary information and resources.

The NASMD currently has 10 TAGs, which cover issues such as welfare reform, long-term care, managed care, and prescription medications. The Eligibility Policy TAG helps state programs and the CMS to interpret and implement welfare reform laws as they affect eligibility for recipients; the Chronic Care TAG, formerly known as the Long-Term Care TAG, handles home- and community-based services, quality and cost-effectiveness of these services, and delivery-of-care methods; and the Fraud and Abuse Control TAG serves as a forum for all control activities, including effective methods of identifying fraud and excess and implementing legislation to strengthen control measures. The Managed Care TAG looks at the cost setting, quality assurance, and state and federal issues that may come to light in the development and implementation of managed-care programs.

Similarly, the Quality TAG offers ongoing information to state programs on the quality of services provided by managed-care programs. The Pharmacy TAG assists state programs with issues concerning prescription drugs, alternative medications, drug utilization, cost containment of medication coverage, and drug dispute authorizations; and the Systems TAG helps CMS and state programs to review the quality of their systems and data collection. The Payment Error Rate Measurement (PERM) TAG was initiated in 2007 to help address issues associated with this new program; the Medicaid and Mental Health TAG helps state programs to address mental health benefits and to identify challenges that arise in this area; and finally, the Coordination of Benefits/Third Party Liability TAG helps to develop better coordination and collection of third-party payments.

Centers

The NASMD also houses the Center for Workers with Disabilities, which helps states administer Medicaid Infrastructure grants. Specifically, the center assists states in developing Medicaid-Buy-In programs for employees with disabilities, and it provides technical guidance and support to states to increase the number of disabled individuals in the workforce. Like the NASMD, the Center for Workers with Disabilities serves as an information exchange between state programs, offering resources for program development, policy analysis, and technical assistance. It benefits from the resources of NASMD, especially when partnering with federal agencies, other state organizations, and policymakers.

The Medicaid and Mental Health Center is also affiliated with the National Association of State Medicaid Directors. This center collaborates with the Substance Abuse and Mental Health Services Administration (SAMHSA), the National Institute of Mental Health (NIMH), and the National Association of State Mental Health Program Directors (NASMHPD) to explore the relationship between Medicaid benefits and mental health needs. The center also collects information and resources on a broad array of services, including state regulation of residential facilities, mental health parity legislation, depression care, service utilization, reimbursement and cost-effectiveness,

and drug therapy effectiveness. While the center focuses on mental health services, it handles the dissemination of information and resources in the same way as NASMD and the Center for Workers with Disabilities.

Future Implications

The NASMD and the APhSA continue to support the changing needs of Medicaid administrators and professionals. State regulations and federal legislation remain dynamic, shifting to reflect new approaches to human services and public health policy. In response to policy reform and new laws, the NASMD created new TAGs and focused on specific key regulation issues. In this sense, the association will play an ongoing and vital role in helping state Medicaid programs and administrators, as well as federal agencies, politicians, and the general public, to provide needed support and resources.

Kathryn Langley

See also Centers for Medicare and Medicaid Services (CMS); Health Insurance; Medicaid; Nursing Homes; Public Policy; State-Based Health Insurance Initiatives; Vulnerable Populations

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Web Sites

- American Public Human Services Association (APHSA): <http://www.aphsa.org>
- Centers for Medicare and Medicaid Services (CMS): <http://www.cms.hhs.gov>
- National Association of State Medicaid Directors (NASMD): <http://www.nasmd.org>

NATIONAL BUSINESS GROUP ON HEALTH (NBGH)

The National Business Group on Health (NBGH) is a nonprofit healthcare coalition that represents large employers' views on national health policy issues and provides practical solutions to its members' healthcare concerns. Based in Washington, D.C., the NBGH's members include mainly large companies, which provide coverage to more than 50 million workers, retirees, and their families throughout the United States. Under the leadership of its president, the NBGH strives to attain transparency, increase the use of technology assessment to ensure access to beneficial new technologies, eliminate ineffective technologies, and make evidence-based practices the standard of healthcare.

Background

The NBGH (formerly known as the Washington Business Group on Health) was founded in 1974 to serve as a leading voice for large employers dedicated to finding innovative and progressive solutions to the nation's most important healthcare issues.

Mission

The main objective of the NBGH is to provide business solutions, be the national voice of large employers, link large employers with Washington, drive national policy on healthcare and productivity issues, and encourage hands-on membership involvement.

Membership

Over 290 companies are members of NBGH. Many of the members are Fortune 500 companies. Current members include such companies as American Express, the Boeing Company, Cisco Systems, DuPont Company, Ford Motor Company, IBM Corporation, Marriott International, Inc., NIKE, Inc., Time Warner, Wal-Mart Stores, Inc., and Xerox Corporation. Membership dues fund

most of the coalition's activities; however, it does receive funds from the federal government, private foundations, and other health-related sources.

Governance, Staffing, and Organizational Structure

The NBGH is governed by a board of directors, which consists of approximately 20 individuals from member companies and the president of the coalition. NBGH's staff consists of approximately 33 individuals, including a president, five vice presidents, and 27 managers, analysts, and other employees. Staff members work in eight areas: (1) finance and administration; (2) membership and member services; (3) public policy; (4) Institute on the Costs and Health Effects of Obesity; (5) Institute on Health Care Costs and Solutions; (6) Global Health Benefits Institute; (7) the Center for Prevention and Health Services; and (8) the Institute on Health, Productivity and Human Capital.

Activities, Services, and Products

The NBGH provides many activities, services, and products for its members. The coalition holds a number of meetings throughout the year, including leadership meetings, employers' summits, and an annual national conference. It holds weekly webinars and monthly conference calls. The NBGH also conducts a number of surveys of its members and provides the results of its surveys to members so that they can benchmark their performance in various areas.

Many of the NBGH's activities center in a number of institutes, committees, and councils. Its institutes and committees include the following: Global Health Benefits Institute; Institute on Health Care Costs and Solutions; Institute on the Costs and Health Effects of Obesity; National Leadership Committee of Consumer Directed Health Care; and National Committee of Evidence-Based Benefit Design. The coalition's councils include the following: Public Policy Advisory Group; Council on Employee Health and Productivity; and Pharmaceutical Council.

The NBGH is engaged in a number of public policy initiatives. It provides its membership with timely information and analysis on health policy issues that have a direct impact on employers. The coalition also encourages its members to be actively

involved in the political process by writing to members of the U.S. Congress and signing petitions. Additionally, the NNBGH works to assist legislators and policymakers to understand how certain issues affect employer-sponsored healthcare.

The NNBGH publishes newsletters, policy briefs, and reports. Many of these publications are available on the coalition's Web site. However, some publications are only available to member companies.

The NNBGH presents several annual awards to its members and others, including the Award for Excellence and Innovation in Value Purchasing, the Best Employers for Healthy Lifestyles Award, and the Behavioral Health Award, to recognize individuals, employers, and programs.

Future Implications

The NNBGH's membership continues to grow, as large businesses are confronted with increasing challenges in tackling complex healthcare issues. With its membership's pivotal involvement, the NNBGH works to improve the health of tens of millions of individuals across the nation. The NNBGH remains a leading voice in advocating for change in healthcare, and it will likely continue to play a key role in shaping the future of the nation's healthcare system.

Jared Lane K. Maeda

See also Cost of Healthcare; Evidence-Based Medicine; Forces Changing Healthcare; Health Insurance; Leapfrog Group; Midwest Business Group on Health; Quality of Healthcare; Technology Assessment

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Web Sites

Leapfrog Group: <http://www.leapfroggroup.org>

Midwest Business Group on Health (MBGH): <http://www.mbg.org>

National Business Coalition on Health (NBCH): <http://www.nbch.org>

National Business Group on Health (NBGH): <http://www.businessgrouphealth.org>

National Labor Alliance of Health Care Coalitions (NLAHCC): <http://www.nlahcc.org>

NATIONAL CENTER FOR ASSISTED LIVING (NCAL)

The National Center for Assisted Living (NCAL) is the assisted living voice of the American Health Care Association (AHCA), the nation's largest association representing long-term care. The diversification of long-term care has brought rapid growth to the assisted living profession, and the center is an important resource for professionals in the field. Specifically, the Center serves the needs of the assisted living community through advocacy activities, education, networking, professional development, and quality initiatives.

Background

Located in Washington, D.C., the NCAL is an individual membership association. Through its national federation of state affiliates, the Center supports lobbying efforts at the state level. While the Center primarily focuses on federal issues, it also provides the support that state affiliates need to affect policy decisions regarding assisted living issues.

The Center's state affiliates actively represent assisted living providers' interests in state regulatory

issues. In recent years, assisted living has received increasing attention at the federal level: the U.S. Congress, the Department of Labor, the General Accountability Office (GAO), and the Department of Health and Human Services have each examined various aspects of assisted living operations.

The NCAL and the AHCA have worked together to offer strong federal representation and have the largest long-term care federal relations in Washington, D.C. Both organizations are recognized as important sources of information and opinion by policymakers and regulators. Whether serving on a federal agency task force or testifying before the U.S. Congress, the Center ensures that its members' voices are heard.

Activities

The NCAL represents the assisted living community through various communications and by working directly with the media. The general public's perception of assisted living affects all the staff members of assisted living organizations and the environment in which providers operate. Whether delivered through news releases, direct media mailings, media interviews, or responses to media queries, the Center's research findings and position statements find their way into newspapers, magazines, and newsletters reaching the public and other critical audiences.

The Center publishes books, reports, and newsletters. One of its most widely read publications is *A Consumer's Guide to Assisted Living and Residential Care*, which is designed to help consumers select an assisted living facility that meets their needs. The book provides a description of services and includes a checklist and cost calculator.

The Center periodically publishes guidance resources for providers. For example, in 2007 it published *The Power of Ethical Marketing*, complimentary copies of which it distributed to all interested parties on request.

The Center publishes a number of monthly newsletters. Its *Assisted Living Focus* covers the latest business news, trends, regulatory activity, and legislative developments concerning long-term care and assisted living. This newsletter also provides examples of some of the best practices in assisted living residences across the nation. The *AHCA/NCAL Gazette* is a daily publication

designed to keep state association leaders informed of state and national news that affects long-term care professionals so that they can incorporate current national trends into their decision making at the state level. *AHCA Notes* is a monthly newsletter that updates the Center's members on long-term care trends as well as state and national regulatory and legislative activity. Additionally, the Center has an e-newsletter, *NCALconnections*, which is targeted at the association's leadership, state affiliates, and associate business members.

The Center also created and sponsors the National Assisted Living Week. Held each September, this annual event is designed to raise awareness of the assisted living profession and to encourage community support. Each year, the Center develops an original *National Assisted Living Week Planning Guide* as well as a product catalog for its members. Both are designed to promote high-quality services in assisted living residences nationwide.

The NCAL is committed to high-quality assisted living services and provides a number of tools and educational products designed for the assisted living professional. The Center actively supports Quality First, a covenant for healthy, affordable, and ethical long-term care, and adherence to its principles and goals. The Center also maintains a professional staff of experts who are available to answer member questions and who conduct original studies, surveys, and other timely research on assisted living.

Together, the NCAL and AHCA host an annual convention and offer a number of educational seminars that are designed to keep assisted living professionals apprised of the latest trends, innovations, theories, and legal developments that affect their operations. State affiliate associations also provide regional educational programs. The NCAL and the AHCA also collaborate to maintain the Mark A. Jerstad Information Resource Center, which contains a wide collection of materials about assisted living that can be accessed by members.

The NCAL's Web site is widely used. Its features include consumer and long-term care information, weekly electronic updates of issues and trends, regulatory issues, previews of and order forms for publications, other assisted living products, and "members only" information.

Katherine Lehman

See also Access to Healthcare; American Health Care Association (AHCA); Disability; Disease Management; Long-Term Care; Medicaid; Medicare; Vulnerable Populations

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Web Sites

- American Health Care Association (AHCA):
<http://www.ahcancal.org>
- National Center for Assisted Living (NCAL):
<http://www.ncal.org>

NATIONAL CENTER FOR HEALTH STATISTICS (NCHS)

Located in Hyattsville, Maryland, the National Center for Health Statistics (NCHS) is the primary health statistics agency of the federal government. NCHS is part of the Centers for Disease Control and Prevention (CDC). Through cooperation with states and other partners, the CDC provides health surveillance to monitor and prevent outbreaks of disease, implement strategies to prevent disease, and maintain national health statistics.

The primary mission of NCHS is to compile statistical information to guide public health and health policymakers. Mandated by the U.S. Congress, NCHS addresses the entire spectrum of human health from birth through death. It investigates overall health status, lifestyles, and exposure

to unhealthy influences affecting designated populations. Data are also gathered on the onset and diagnosis of illness and disability. For health policymakers, NCHS investigates the use and financing of healthcare and rehabilitative services. In addition to data collection and analysis, NCHS disseminates its data to interested health partners, conducts studies in statistical and survey research methodology, and provides technical assistance in access to or use of existing health-related data. It also has cooperative working programs with public and private agencies and organizations at the state, national, and international levels.

History

The first NCHS surveys on the nation's health were mandated through the federal National Health Survey Act (PL 84-652) enacted on July 3, 1956. The purpose of these surveys was to provide continuing study of the nation's health. These surveys also provided a means for the study of methods and techniques for obtaining statistical health information and disseminating the findings to those who could benefit from them.

In 1960, NCHS became an established organization within the U.S. Public Health Service (PHS) through the merging of the National Health Survey and the National Office of Vital Statistics. The PHS became responsible for vital statistics in 1946 as a result of the transfer of that responsibility from the U.S. Bureau of the Census.

NCHS was established in law and its mandate codified under Section 306 of the Public Health Services Act through the Health Services Research and Evaluation and Health Statistics Act of 1974 (PL 93-353). This act required NCHS to perform a variety of functions related to health in the United States. NCHS was called on to collect a wide range of statistical information on illness and disability nationwide. Data from birth, death, marriage, and divorce records were to be obtained annually. NCHS also had the role of supporting research, demonstrations, and evaluations regarding survey methods. Technical assistance was to be provided to state and local jurisdictions. Finally, this act established the National Committee on Vital and Health Statistics, which provided an expert advisory committee to the Secretary of the Department of Health and Human Services (HHS).

Authority was established in 1970 and then formally instituted through PL 95-623 in 1978 to create the Cooperative Health Statistics System. The purpose of this program was to coordinate as well as provide support and evaluation of the state and federal health statistics systems.

In 1989, with the establishment of the Agency for Health Care Policy and Research by PL 101-239 for the study of healthcare effectiveness and outcomes, the legislative authority of the National Center for Health Services Research (NCHSR) was eliminated. This law produced a number of amendments to NCHS's authority.

As the interest in obtaining more detailed data on racial and ethnic populations grew, the federal Disadvantaged Minority Health Improvement Act of 1990 (PL 101-527) mandated NCHS to obtain vital statistics, conduct national surveys, and establish a grants program for learning more about minority populations.

Data Sources and Surveys

NCHS employs a variety of methodologies and collaborations with public and private health partners to obtain accurate information regarding the health of the population, influences on health, and health outcomes. Data systems and surveys are employed, with some conducted annually and others periodically. Systems based on populations collect information through personal interviews with individuals, physicians, and facility administrators in healthcare organizations. They also obtain information through examinations, such as physical and dental examinations, laboratory tests, and nutritional assessments. Systems based on records look at hospital records, state vital registration and state death certificates for information. Many of NCHS's surveys are conducted via telephone interviews, including the National Immunization Survey (NIS), the National Asthma Survey (NAS), the National Survey of Children's Health (NSCH), and the Joint Canada/United States Survey of Health (JCUSH).

Population-based surveys include the National Health Interview Survey (NHIS), the National Health and Nutrition Examination Survey (NHANES), and the National Survey of Family Growth (NSFG). Record-based surveys include the

National Health Care Survey (NHCS) and the National Vital Statistics System. Many key surveys and data sources are detailed below.

National Health and Nutrition Examination Survey (NHANES)

The NHANES is a very comprehensive assessment that aims to get a picture of the health and nutritional status of the general population. Data are obtained on a nationally representative sample of approximately 5,000 people of all ages each year. Much focus has been placed on obtaining data on African Americans, Mexican Americans, adolescents, pregnant women, and people over age 60. While some of the data are obtained through home-based personal interviews, much of the information is collected through the use of specially designed Mobile Examination Centers that allow for quality control. These mobile centers travel to 15 sites in the nation each year, conducting physical medical examinations, standardized dental examinations, physiological measurements, and laboratory tests on blood and urine. The data collected include the prevalence of specific conditions or chronic diseases, blood pressure, serum cholesterol, body measurements, nutritional status and deficiencies, and exposure to environmental toxins.

NHANES also studies a number of diseases, medical conditions, and health indicators that affect the nation's population. These conditions include allergies, anemia, diabetes, eye disease, hearing loss, kidney disease, nutrition, obesity, oral health, osteoporosis, physical activity and fitness, vision, cardiovascular disease, cognitive functioning, environmental exposure, infectious diseases, reproductive history, sexually transmitted diseases, supplements, and medications. These data are considered the most authoritative source for standardized clinical, physical, and psychological information on the nation's population. Findings from the survey are used by a joint U.S. Department of Health and Human Services and U.S. Department of Agriculture program that monitors the diet and nutritional status of Americans to create food policies and dietary guidelines. Results are published in Series 11 of the *Vital and Health Statistics* series and *Advance Data from Vital and Health Statistics*.

National Health Care Survey (NHCS)

The NHCS is a record-based survey designed to collect data that can be used to analyze patient outcomes, the relationship between health and use of health services, and the use of healthcare services at the local level. The NHCS constitutes a family of surveys each of which relates to a specific setting. Currently, there are four surveys that study aspects of ambulatory- and hospital-care settings: the National Ambulatory Medical Care Survey (NAMCS), which samples visits to nonfederally employed physician's offices that primarily provide service in direct patient care; the National Hospital Ambulatory Medical Care Survey (NHAMCS), which is conducted in a national sample of hospital emergency and outpatient departments in the 50 states and the District of Columbia; the National Hospital Discharge Survey (NHDS), which obtains a representative sample of information on inpatients discharged from short-term hospital stays in general and children's general hospitals; and the National Survey of Ambulatory Surgery (NSAS), which provides the only national sample of information regarding ambulatory-surgery visits.

Two other surveys included in this family of surveys are the National Home and Hospice Care Survey (NHHCS) and the National Nursing Home Survey (NNHS), which address long-term care settings. The NHHCS collects information about licensed or certified agencies providing home and hospice care as well as their current patients and discharges. The NNHS provides a national sample of data about licensed or certified nursing homes, their residents, and their staff.

National Health Interview Survey (NHIS)

The NHIS is a major data collection project of NCHS. Beginning with the National Health Survey Act of 1956, continuing surveys and studies were established to gather current, accurate statistical information on illness and disability in the United States. These studies and surveys were specifically concerned with measuring the incidence, prevalence, and distribution and effects of disease, and the medical services rendered to treat them. The first survey from this act was initiated in 1957 and is now called the National Health Interview

Survey. In 1960, NCHS began conducting the survey following the merging of the National Health Survey and the National Vital Statistics Division.

The NHIS is a population-based survey providing principal information on the status of health, illness, and disability of civilian, noninstitutionalized populations in the nation. The survey is conducted annually through interviews of approximately 50,000 households. Questions are based on current health topics, which may vary from year to year. For example, in 1986, topics focused on health insurance, vitamin use, dental care, and longest job worked. In 1990, the focus was on health promotion and disease prevention, assistive devices, podiatric services, and hearing impairments. Since 1987, questions on knowledge and attitudes about HIV/AIDS have been included each year. Data from the survey provide information on the incidence and prevalence of disease and the relationship between health and demographic and socioeconomic characteristics. Results of the survey are published in Series 10 of *Vital and Health Statistics* series and *Advance Data From Vital and Health Statistics*.

National Immunization Survey (NIS)

The NIS, sponsored by the National Immunization Program (NIP) and conducted jointly by NIP and NCHS, began in 1994. This survey monitors childhood immunization coverage levels among children in the nation. Estimates of vaccination coverage are generated for each of 78 Immunization Action Plans (IAP) which include the 50 states, the District of Columbia, and 27 large metropolitan areas; NIS also provides estimates at the national level. Newly licensed vaccinations recommended for use are included as well. The survey uses a random digital dialing telephone method, searching for households with children aged 19 to 35 months currently living in the nation. Parents or guardians are interviewed to provide names and dates of vaccines charted on the child's "shot card" that is kept in the home. Demographic and socioeconomic information is also collected. At the end of the interview, the interviewers ask permission to follow up by mail with the child's vaccination providers, which may include pediatricians, family physicians, and other health providers, for verification. Quarterly estimates of

vaccination coverage are calculated, and data are used to evaluate progress toward national goals, such as the Healthy People 2010 initiative. The CDC also uses this data to identify states with the highest and lowest rates of immunization.

Longitudinal Studies of Aging (LSOAs)

The LSOAs is a collaborative effort between NCHS and the National Institute on Aging (NIA). Two cohorts of persons aged 70 years or older are studied for changes in health, functional status, living arrangements, and the use of health services as they move through the older ages of life. Four surveys are included in this project: the 1984 Supplement on Aging (SOA); the 1984–1990 Longitudinal Study of Aging (LSOA); the Second Supplement on Aging (SOA II); and the 1994–2000 Second Longitudinal Study of Aging (LSOA II). A recent addition is the 1994–2002 LSOA II Linked Mortality File, which includes all the participants of the LSOA II aged 70 and older. It provides follow-up mortality data, including fact, date, and cause of death, from the LSOA II participation from 1994–2000 through December 31, 2002.

National Survey of Family Growth (NSFG)

The NSFG, a population-based survey conducted through household interviews of women of childbearing age, monitors change in childbearing practices and measures reproductive health. More specifically, these data address family-planning practices and attitudes, factors influencing fertility, fecundity impairments, sexual activity, family formation, and aspects of maternal and child health. Cycles I and II of this survey began in 1973 and 1976, with interviews conducted with approximately 10,000 never-married women aged 15 to 44 years. The population sample was expanded with Cycles III and IV in 1982–1983 and 1988, respectively, to include a representation of all women aged 15 to 44 years regardless of marital status. At this time, new topics were also introduced to include beginning of sexual activity, first use of contraceptives, first use of family planning services, knowledge and experience of sexually transmitted diseases, and adoption. During Cycle IV in 1990, respondents were reinterviewed by telephone. Results are published in Series 23 of the

Vital and Health Statistics series and *Advance Data From Vital and Health Statistics*.

National Vital Statistics System (NVSS)

The NVSS is a collaborative intergovernmental effort to obtain official vital statistics on the registration of births, deaths, marriages, and divorces at the state and local levels within the 50 states, two cities (Washington, D.C., and New York City), and five territories (Puerto Rico, the Virgin Islands, Guam, American Samoa, and the Commonwealth of the Northern Mariana Islands). These data provide public health officials with important information for monitoring progress in achieving health goals. These data can tell public health officials, for example, the number and location of teen births in a given year, the risk factors for problematic pregnancies, the rate of infant mortality, the leading causes of death, and the life expectancy of a population. One very significant component of the NVSS is the National Death Index (NDI). In collaboration with state offices, NCHS is able to index death records that may be used for epidemiological studies or verifications of death for individuals being studied. Additional components of the NVSS include Linked Birth and Infant Death Data Set, the National Survey of Family Growth, the Matched Multiple Birth Data Set, the National Maternal and Infant Health Survey, and the National Mortality Follow-back Survey. Data from the NVSS are published in electronic form through the *Vital Statistics of the United States*, the *National Vital Statistics Reports*, and additional reports. In addition, electronic micro-data files containing individual vital records are accessible for public use.

Health Topics

NCHS also produces data covering a wide range of specific health topics. Summary data sheets are made available on its Web site for important current health concerns. The site provides portraits of health status for specific critical age groups, such as infants and toddlers, children, adolescents, and older adults. Information on health conditions such as cancer, injuries, obesity, and teenage pregnancy is available. Individual summary data sheets also address current health-related issues, including

patient safety, health insurance and access to care, and racial and ethnic health disparities.

Utilization of Data

Numerous audiences make use of NCHS data. The U.S. Congress and health policymakers use the data to track initiatives, prioritize prevention and research programs, and evaluate outcomes. Epidemiologists, biomedical researchers, and health services researchers look for trends in diseases, uncover the relationship between risk factors and diseases, and monitor the use of health services. Pharmaceutical and food manufacturers, research firms, consulting firms, and trade associations make use of the data for their businesses. Public health professionals employ this information to determine preventable illnesses and evaluate intervention programs. Physicians use the data to evaluate health and risk factors in their patients, such as cholesterol, weight, blood pressure, and growth chart records for children. Media and advocacy groups rely on the data to help raise awareness of major health issues such as cancer, diabetes, heart disease, Alzheimer's disease, and health disparities.

International Activities

The NCHS works collaboratively with other countries and other agencies of the PHS to conduct comparative international research. Experts from the United States and other countries are brought together to focus on specific health issues of mutual interest. Some examples of global research include the examination of perinatal and infant mortality, health and healthcare of the elderly, and international comparability of health data.

Research and Survey Methodology

The NCHS also maintains an active program in statistical research and survey methods. The National Laboratory for Collaborative Research in Cognition and Survey Measurement, a major initiative started in 1985, applies cognitive methods in questionnaire survey research design. The NCHS develops and tests its data collection instruments in collaboration with other internal programs and through research contracts with

academic scientists. Another area of interest for NCHS is determining analytical methods for their registration systems and sample surveys. Research is also conducted on the development of automated and graphical technology. Survey design research, where a program is developed to evaluate, redesign, and link many of the surveys so as to improve efficiency and analytical capability, remains an important area of focus.

Publications and Data Access

The NCHS uses multiple means to disseminate vital and health statistics and the results of its research to as broad a range of people as possible. In addition to publications, public use data files, and unpublished tabulations, efforts are made to reach various specialized groups of data users, health professionals, and the general public through journal articles, presentations, speeches, conferences, workshops, and consultations. Information services available through the NCHS also provide reference and referral services, maintain mailing lists for distribution of new publications, coordinate requests for presentations and exhibits, and issue a catalog of publications and electronic products.

Its Web site makes data on current important health concerns available. Published reports also are available both in print and online. Major publication series include *Health, United States, Vital and Health Statistics*, *Advance Data From Vital and Health Statistics*, *Vital Statistics of the United States*, and *Monthly Vital Statistics Report*. In addition, data files for public use are made available to researchers for analysis. Pretabulated tables of state-level data are prepared on specific interest health issues such as births and deaths. State and national data on a range of health topics are available through interactive data warehouses, examples of which include *Health Data for All Ages* and *Trends in Health and Aging*. At the Research Data Center, detailed data are available through secure access.

Future Implications

The NCHS plays a vital role in the collection, interpretation, and dissemination of important health data. Through its many surveys and studies, as well as its collaborative efforts with state,

regional, community, and academic entities, the NCHS captures broad and in-depth information on individuals, health professionals, and health-care institutions. Further advances in technology will make this data, recommendations, and research findings even more accessible.

Barbara Nail-Chiuvetalu

See also Centers for Disease Control and Prevention (CDC); Data Sources in Conducting Health Services Research; Health Indicators, Leading; Health Surveys; Morbidity; Mortality; Public Health; Public Policy

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Web Sites

- Centers for Disease Control and Prevention (CDC):
<http://www.cdc.gov>
- National Center for Health Statistics (NCHS):
<http://www.cdc.gov/nchs>

NATIONAL CITIZENS' COALITION FOR NURSING HOME REFORM (NCCNHR)

The National Citizens' Coalition for Nursing Home Reform (NCCNHR) is a nonprofit membership

organization that advocates for the rights, safety, and dignity of America's long-term care residents. Located in Washington, D.C., NCCNHR is a coalition of approximately 200 citizen advocacy organizations with members from 42 states in the United States as well as long-term care ombudsman from most states. These organizations and NCCNHR's approximately 1,000 individual members work to improve the quality of long-term care, largely focusing on nursing home care and assisted living but recently expanding to include home and community-based care.

Both its mission and structure make NCCNHR a unique organization. Most citizen advocacy groups in healthcare tend to focus on one disease or on conditions affecting a single organ system (e.g., American Cancer Society), or they focus on a specific group of citizens (e.g., AARP), attempting to address the entire spectrum of their health needs. In contrast, NCCNHR advocates for individuals receiving one type of healthcare—residential long-term care.

This national-level coalition of diverse citizen action groups had its beginning in 1975. Its founder, Elma L. Holder, was then working with the National Gray Panthers' Long-Term Care Action Project. She organized a conference in Washington, D.C., that included members of a dozen citizen advocacy groups who came together to speak with the nursing home industry concerning the need for fundamental change in their operations. At the conference, attendees discovered that they shared a variety of common interests. These interests and goals led them to form NCCNHR. Holder became NCCNHR's first executive director, a position she held for two decades, during which she transformed the organization from a small startup advocacy group to its current status as the primary voice of nursing home residents in national public policy.

Throughout its years of operation, NCCNHR has engaged in a wide variety of activities to improve nursing home care. It has trained members of the national service program Volunteers in Service to America (VISTA), operated a National Long-Term Care Ombudsman Resource Center, maintained an information clearinghouse on residential long-term care, issued reports on a range of topics, published books to inform consumers and policymakers, and educated members of the

U.S. Congress and officials in executive branch agencies who play major roles in long-term care public policy. It also provides important technical assistance and support to its member organizations that work for change at the state and local levels.

One of NCCNHR's greatest achievements was its involvement in the development, passage, and implementation of the Nursing Home Reform Act, part of the federal Omnibus Budget Reconciliation Act of 1987 (OBRA-87). NCCNHR was the motivating core of a coalition of consumer groups, unions, and provider associations that generated bipartisan support for the OBRA-87 reforms. OBRA-87 contained the seeds of a new model of nursing home care that included uniform resident assessment, increased attention to resident rights and quality of life, and a revised set of quality standards and enforcement remedies. OBRA-87 was a fundamental change in federal regulation, shifting the focus of regulators from paper compliance with regulations to the actual care and quality of life experienced by residents. Furthermore, with its focus on resident-centered care, it laid the foundation for the current movement for culture change in nursing homes.

As important as its role in the development and passage of federal legislation was, NCCNHR also deserves considerable credit for its dogged determination to ensure that all elements of OBRA-87 were implemented in their original form. While the nation's nursing home industry did not use all of its considerable political power to oppose OBRA-87's passage, the industry did commit itself to delaying the implementation of the enforcement remedies and attempting to have these measures watered down as they were translated into rules and regulatory procedures. During this period of conflict in the mid-1990s, NCCNHR was the unifying force that brought together citizen advocates, medical and gerontological professionals, and policymakers to fight against efforts to repeal segments of OBRA-87 or to render it toothless in its implementation.

In recent years, NCCNHR has expanded its emphasis from concerns about standards and enforcement to include more engagement with the nursing home industry and regulatory agencies in their quality improvement efforts. In part, this change reflects the nursing home industry's relative success in riding the wave of "healthcare excellence," which is so popular in current public

policy circles. This approach to thinking about quality moves policymakers away from a purely punitive or regulatory approach. Instead, it places much more emphasis on collaborative quality improvement efforts involving government, consumers, and providers. As part of this effort, NCCNHR has embraced the culture change movement in nursing homes, voicing its support for such resident-centered approaches to care as the Pioneers, the Eden Alternative, the Wellspring Initiative, and the Green House Movement.

In terms of its organizational structure, NCCNHR is governed by a 20-person board, which includes a number of nursing home residents. Board members are elected by NCCNHR's member groups and meet quarterly to deal with policies, financing, and strategic planning. The Executive Director, approximately seven paid staff members, a few consultants, and volunteers conduct its Washington, D.C., operations. As with many groups advocating for vulnerable populations, maintaining adequate funding is NCCNHR's major organizational challenge. It has an annual budget of approximately \$1.2 million. Over 40% of NCCNHR's current revenues come from a grant supporting its operation of the National Long Term Care Ombudsman Resource Center. Other grants and donations provide the remainder of NCCNHR's revenues.

Recently, NCCNHR changed its name. It is now the NCCNHR: the National Consumer Voice for Quality Long-Term Care. This new name reflects its broadened mission. Since its inception in 1975 it has, with scarce resources, successfully advocated for millions of frail and vulnerable Americans receiving nursing home care. Its current advocacy efforts include such public policy issues as nursing home staffing standards, poor working conditions in nursing homes, residents' rights and empowerment, the development of family councils for residents' families, reducing physical and chemical restraint use, the high costs of poor quality care, and the adequacy of quality assurance in assisted living and other forms of residential care.

Charles D. Phillips and Catherine Hawes

See also Long-Term Care; Medicaid; Nursing Home Quality; Nursing Homes; Public Policy; Quality of Healthcare; Vulnerable Populations

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Web Sites

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- National Long Term Care Ombudsman Resource Center (ORC): <http://www.itcombudsman.org>
- Pioneer Network: <http://www.pioneernetwork.net>
- Social Security Online, Omnibus Budget Reconciliation Act of 1987 (OBRA-87), Public Law 100-203, Subsection C: Nursing Home Reform: http://www.ssa.gov/OP_Home/comp2/comp2toc.html

NATIONAL COALITION ON HEALTH CARE (NCHC)

The National Coalition on Health Care (NCHC) is one of the nation's largest and most broadly representative alliances working to improve healthcare in America. The nonprofit and nonpartisan NCHC was founded in 1990 and comprises more than 70 organizations, employing or representing about 150 million Americans. The coalition works to bring large and small employers as well as consumer, labor, and religious groups, primary-care providers, and health and pension funds together. The core principles of NCHC include the following: bringing healthcare coverage to all, managing healthcare costs, improving healthcare quality and patient safety, increasing administrative simplification, and ensuring more equitable financing. The coalition's slogan states that the nation is capable of achieving better and affordable healthcare for everyone.

Overview

The NCHC is headquartered in Washington, D.C. The honorary cochairs of the organization include former presidents George H. W. Bush and Jimmy Carter. The present cochairs include the former governor of Iowa, Robert D. Ray and the former member of the U.S. Congress from Florida, Paul G. Rogers. In addition, 14 members serve on the Board of Directors; these individuals are prominent in the fields of politics, academia, and health and community services and in the business sector. The NCHC also has a staff comprising the president, executive director, senior vice president for policy and strategy, senior vice president for operations, and administrative staff. Additionally, the various members of the coalition include large and small businesses; labor, consumer, religious, and primary-care provider groups; distinguished leaders from academia, business, and government; and distinguished politicians.

Purpose and Principles

The NCHC seeks to focus public attention on the current problems and inequities in America's healthcare system. It strives to provide people with factual information, helping them to form educated opinions and bring about necessary change. In addition, the NCHC's health advocacy efforts are centered on three main issues: (1) the state of the quality of healthcare in the nation, (2) the rising costs of healthcare, and (3) the growing number of uninsured and underinsured Americans. These issues have been addressed by the coalition's national social marketing and education strategy campaign, which is focused on establishing a national policy that will ensure access to quality, appropriate, and affordable healthcare.

To accomplish the goals of improving the quality of care, lowering costs, and providing health insurance coverage to all Americans, the NCHC has identified five guiding principles that it feels are necessary for effective policy reform.

Healthcare Coverage for All

The NCHC advocates for mandatory health coverage for all. This goal can be accomplished in many ways, including efforts that involve the use

of employer and individual mandates, Medicaid and State Children's Health Insurance Program (SCHIP) expansion, individual subsidies, and a number of related ideas as part of a multifaceted approach.

Cost Management

The NCHC supports the creation of an independent board, chartered and overseen by the U.S. Congress, that would be responsible for establishing and administering measures for calibrating rates and limitations to keep costs and insurance premiums in alignment with defined annual targets.

Improvement of Healthcare Quality and Safety

The NCHC recommends the establishment of a federal board to lead the development and coordination of a national effort to improve healthcare quality and set common treatment standards. In addition, the proposed board would oversee protocols for patient records, prescription ordering, billing standards, and privacy standards.

Equitable Financing

The NCHC's members suggest that health plans should be funded from a wide variety of sources, including general revenues, earmarked taxes and fees, employer contributions, individual contributions, and co-payments. The NCHC also advocates the use of sliding scale assistance for lower-income citizens.

Simplified Administration

The NCHC endorses the establishment and utilization of a core standard healthcare benefits package to create a consistent set of ground rules for patients, payers, and providers. The creation of a national information technology structure for healthcare should ultimately lead to decreased costs and medical errors.

Strategies

The NCHC uses different approaches to target and reach healthcare interest groups, community

activists, the media, and the general public. The coalition began its work by identifying concerns and gaps in the public's knowledge. As a result, it has published a series of reports designed to furnish basic information about the changes and challenges in the nation's healthcare system.

One of NCHC's recent reports, *Prevention's Potential for Slowing the Growth of Medical Spending* (2007), deals with the preventive aspects of healthcare interventions. Using immunizations as an example, the report highlights the future cost savings of early prevention efforts. Previous reports released by the coalition have focused on cost, quality, and access to healthcare.

In addition to publishing reports, the NCHC furthers its advocacy campaign through involvement in public forums, congressional hearings, conferences, social events, and media appearances. Much of the coalition's work is available and accessible online at its Web site.

As a nonpartisan alliance, the NCHC briefs policymakers and shares its reports with politicians and bureaucrats in the administration. Local representatives that are coalition members also reach out to other organizations and opinion leaders at the state level. In the past, the coalition has also conducted a national advertising campaign in popular media outlets, including *The New York Times*, *The Washington Post*, *USA TODAY*, and *Roll Call*. Coalition members also place advertisements in their own internal publications and in the local media.

Fact Sheets

The NCHC has developed fact sheets on many issues, which are broadly classified into five categories: health insurance coverage, cost, quality, world healthcare data, and economic sheets. Several of the coalition's available economic fact sheets point out the impact of rapidly escalating healthcare costs and insurance premiums on workers and their families, business operations, small businesses, pension programs and beneficiaries, the federal budget, state governments, and local communities. Healthcare researchers, healthcare activists, and the general public can use these compiled resources. For example, the fact sheet on World Healthcare Data provides information on Canada, France, Germany, the United Kingdom,

and Japan. These data offer a global view of different healthcare systems, their funding resources, and the costs associated with them.

Future Implications

The NCHC is a broad-based organization that advocates for a multitude of changes to the nation's healthcare system. It is important to note, however, that the coalition's members also include large national insurance companies and pharmaceutical corporations. While these members might represent a conflict of interest, the coalition continues its media campaigns and furthers its commitment to improving the quality of healthcare, decreasing healthcare costs, and increasing access to health insurance coverage.

Vikrant Vats

See also Access to Healthcare; Cost Containment Strategies; Cost of Healthcare; Health Insurance Coverage; Medical Errors; Patient Safety; Quality of Healthcare; Uninsured Individuals

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Web Sites

- Institute for Healthcare Improvement (IHI):
<http://www.ihl.org>
- National Coalition on Health Care (NCHC):
<http://www.nchc.org>

NATIONAL COMMISSION FOR QUALITY LONG-TERM CARE (NCQLTC)

The National Commission for Quality Long-Term Care (NCQLTC) is a nonpartisan and independent body charged with the responsibility for improving long-term care in the United States. The commission, which has been cochaired by former U.S. Senator Bob Kerrey and former Speaker of the House of Representatives Newt Gingrich, comprises appointed commissioners who reflect a diversity of backgrounds ranging from academic, government, quality improvement, and long-term care settings. The commission was created as an outgrowth of a long-term care industry-driven quality initiative titled "Quality First: A Covenant for Healthy, Affordable, and Ethical Long-Term Care," and it is overseen by The New School.

In 2004, three leading long-term care organizations called for an independent commission to evaluate the quality of long-term care in the nation, identify the factors that influence quality improvement, and recommend strategies to sustain quality improvement nationally. The commission was convened in October 2004 and was originally housed at the National Quality Forum. The three founding organizations—the Alliance for Quality Nursing Home Care (AQNHC), the American Association of Homes and Services for the Aging (AAHSA), and the American Health Care Association (AHCA)—provide funding for the commission's work. The commission functions independently, led by its executive director Doug Pace, and is currently located at The New School.

Background

The growing concern over the quality of long-term care prompted the three major long-term care organizations listed above to pledge to a 5-year voluntary initiative entitled "Quality First: A Covenant for Healthy, Affordable, and Ethical Long-Term Care" on July 16, 2002. This initiative was aimed at attaining excellence in the quality of care and services for older persons as well as increasing the public trust in the delivery of care

and services. The reasoning behind this initiative was that, if quality could be reliably measured and the results made publicly available, providers would be motivated to improve their quality, and the public would be able to distinguish between good and poor performers.

At about the same time, the U.S. Department of Health and Human Services (HHS) launched its Nursing Home Quality Initiative (NHQI) and the Home Health Quality Initiative (HHQI). With the growing number of initiatives focused on long-term care, there was a need for an independent body to evaluate long-term care quality, identify the factors that influence improvements in quality of care, and make recommendations about national efforts that could result in sustained quality improvement.

Long-Term Care Reform

The nation's long-term care system is currently straining to meet the demands of a growing older population whose magnitude was never anticipated. Some of the challenges that the system is confronted with include individuals who face a loss of independence because of disability and who may also be confronted with a loss of home, income, and/or assets. Individuals may also face a loss of their family and choice among long-term care options. Often families have little of the information or training needed to support those with disabilities; direct care workers are generally paid low salaries and receive little respect from the medical community and general public. Provider organizations may be pressured to deliver high-quality care but face constraints with low reimbursements. In addition, regulatory agencies are unable to enforce regulations that should serve to protect individuals receiving long-term care due to staffing shortages; and policymakers are grappling with pressures to improve long-term care while balancing the budget.

Given the challenges of the nation's long-term care system, the commission is committed to finding solutions to the most pressing questions that affect the aging population. These questions include the following: How can long-term care be financed consistently with policies that ensure that all Americans have choices? How can long-term care workers be retained? What are the best approaches for improving and ensuring quality? Where can

Americans obtain credible information to compare their options for long-term care?

Although the nation's long-term care system faces significant challenges, there is much promise of finding feasible solutions. The commission has laid out a road map for long-term care reform with six key areas: culture transformation, empowering individuals and families, workforce, technology, regulation, and finance.

The commission believes that the culture of long-term care can be transformed through organizational innovations that improve an individual's quality of life and quality of care. Some promising initiatives that can facilitate this cultural transformation include resident-centered care and the provision of palliative and hospice care. Additionally, individuals and families can be empowered through a broader array of high-quality, affordable, and accessible long-term care services that are available in homes and communities. Family caregivers must also be given the tools, information, and support that will allow them to continue their role in caring for those with disabilities. The long-term care workforce must be supported to improve their working conditions and wages and be provided with greater opportunities for advancement. Technology should be used more effectively to promote higher quality of care and greater consumer independence. Furthermore, long-term care regulations must be accurate, timely, and consistently implemented to improve quality. Last, the commission believes that there should be a long-term care financing system that is fair and equitable and that every American should have access to the services they need to live independently for as long as possible.

Future Implications

The long-term care system is faced with daunting challenges in the way of meeting the needs of a growing elderly population. On December 3, 2007, the commission issued its final report that called for a national discussion about how the nation can create a new and better long-term care system. The report features recommendations in the areas of workforce, quality, and technology. In addition, it also discusses important steps that must be taken in identifying crucial features of a long-term care financing system.

Jared Lane K. Maeda and Douglas Pace

See also Access to Healthcare; Long-Term Care; Medicaid; Medicare; Nursing Home Quality; Nursing Homes; Quality Indicators; Quality of Healthcare

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Web Sites

- National Commission for Quality Long-Term Care (NCQLTC): <http://qualitylongtermcarecommission.org>

NATIONAL COMMITTEE FOR QUALITY ASSURANCE (NCQA)

The National Committee for Quality Assurance (NCQA) is a major driving force in improving the quality of the nation's healthcare system. NCQA establishes standards of quality and service that health plans should provide to their members. Known for its Healthcare Effectiveness Data and Information Set (HEDIS) measures, NCQA provides voluntary accreditation of physicians, medical groups, and health plans. It strives to transform the quality of healthcare through measurement, transparency, and accountability.

Background

Located in Washington, D.C., the National Committee for Quality Assurance (NCQA) was founded in 1990 as a private, nonprofit organization. At the time, there were few nationwide efforts to systematically measure and improve quality. Since then, NCQA has been working vigorously with employers, providers, health plans, patients, and policymakers to build a consensus on healthcare quality. These efforts have focused on how to best measure and improve quality.

NCQA maintains a diverse set of programs to accomplish its mission of improving quality in healthcare. Specifically, it offers five accreditation programs, four certification programs, and four physician recognition programs that apply to health plans, medical groups, and individual physicians, all of which are voluntary. NCQA relies on the system of measure, analyze, improve, and repeat to address healthcare quality.

Quality Assessment

NCQA employs a variety of approaches to assess healthcare quality, including on- and off-site surveys, audits, satisfaction surveys, and performance measures. It uses these methods in its accreditation, certification, recognition, and performance programs that evaluate organizations, medical groups, and physicians. Through these programs, NCQA obtains relevant information on healthcare quality that is made available to consumers, employers, health plans, and physicians. The information gathered from these programs can be used by consumers and employers to make informed purchasing decisions regarding their healthcare as well as drive quality improvement efforts.

NCQA's seal is highly recognized as a symbol of quality. The organizations and individuals who participate in NCQA's programs earn the privilege of using the Committee's seal. Organizations that seek NCQA accreditation must pass a rigorous and comprehensive review and complete an annual performance survey. Health plans must meet more than 60 standards and report on performance in more than 40 areas to be accredited with additional criteria that continue to be added each year. Although the standards and requirements per assessment program vary, the participating organizations and individuals must be able to demonstrate

that quality practice, clinical, and satisfaction thresholds are met. In 2008, NCQA started evaluating preferred provider organizations (PPOs) on the same standards, measures, and patient experience ratings that it uses to evaluate health maintenance organizations (HMOs) and point of service (POS) plans, to allow consumers and purchasers to reliably compare across different health plans.

Many of the nation's leading employers, federal and state government, and individual consumers rely on NCQA's accreditation to select among various health plans. Furthermore, in more than 30 states, health plans that are NCQA accredited are exempted from most or all of the requirements of annual state audits.

NCQA also offers a variety of educational programs and publications for providers and organizations to help meet quality goals. These programs include educational seminars, online continuing education programs, corporate training, and special events.

Performance Measurement

NCQA has played a significant role in refining performance measures. Performance measures allow for the direct comparison of health plans. In the mid-1990s, NCQA developed objective measures that resulted in a standardized measurement tool known as the Healthcare Effectiveness Data and Information Set (HEDIS), which is widely used by the industry. It has also developed other measures for various healthcare organizations.

HEDIS is a tool used by over 90% of the nation's health insurance plans to measure areas of patient care and service. This comprehensive tool surveys a broad area of healthcare that includes 71 measures over 8 domains of care. HEDIS measures cover the effectiveness of care; health plan stability; cost of care; access of care; use of services; informed choice; health plan information; and satisfaction of care. Some areas of HEDIS measurement include breast cancer screenings, beta-blocker treatment after a heart attack, antidepressant medication management, and comprehensive diabetes care.

The availability of HEDIS allows for an objective, standardized measurement and reporting that permits side-by-side comparison on the performance of health plans and comparison of performance to benchmarks. HEDIS also enables

health plans to target their areas of improvement. To stay current, the HEDIS measurement set is updated annually. Employers and patients use HEDIS data and accreditation information to make their purchasing decisions. Health maintenance organizations (HMOs) submit HEDIS data to participate in the Medicare Advantage program.

The early efforts of HEDIS included a narrow set of preventive process measures. Since then, HEDIS has grown to include a broad array of measures that include the underuse, overuse, value, processes, and outcomes of care. In 2008, HEDIS included measures that assess how many children under 2 years of age and enrolled in a Medicaid managed-care program have been tested for lead exposure. Another new measure examined if patients with aggravated chronic obstructive pulmonary disease (COPD) received prescriptions for bronchodilators and systemic corticosteroids at discharge from a hospital or emergency department.

As the HEDIS measures continue to evolve, NCQA ensures that the measures contain the features of relevance, soundness, and feasibility. NCQA also makes certain that the measures are valid, address focal areas, and are not onerous to implement.

NCQA has published *The State of Health Care Quality* since 1997, which gives an overall assessment of the U.S. healthcare system. This report is released just prior to the open-enrollment season when individuals choose their health plan for the following year. Over the past 5 years, the report has shown that health plans have made significant improvements across a broad range of quality measures.

Physician Recognition

NCQA's physician recognition programs help patients identify providers who consistently deliver evidence-based care. Employers have also begun to realize the value of the physician recognition program.

In collaboration with the American Diabetes Association and the American Heart Association/American Stroke Association, NCQA has developed two physician recognition programs. These programs recognize physicians who deliver excellent care to patients with diabetes or cardiac-related

illnesses. Physicians who participate in the recognition programs have also rapidly improved the care they deliver. Those who participated in the Diabetes Physician Recognition Program increased their rates of nephropathy screening, lipid screening, and blood pressure control by 50% to 100% within 5 years.

Another program, the Physician Practice Connection, recognizes physicians who have implemented practice systems, such as electronic medical records, that help them consistently deliver high-quality care. A new program will identify physicians who provide efficient and effective evidence-based care for patients with back pain.

Public Reporting

An educated consumer serves as a powerful driving force for improving healthcare. Thus, NCQA works to facilitate informed consumer choices by making available, free of charge, most of the information it collects on health plans, medical groups, and physicians to the media and individuals via the Internet. To reach as wide an audience as possible, NCQA also maintains a partnership with *U.S. News & World Report* to produce its annual list of “America’s Best Health Plans.”

NCQA also has a number of tools available to help consumers make informed decisions. The interactive Health Plan Report Card contains a searchable database that allows consumers to choose an appropriate health plan. The report card, which is based on the review of hundreds of health plans, includes a comprehensive evaluation of member satisfaction, clinical quality, and key systems and processes as well as accreditation information and performance ratings. NCQA also makes available an online directory of physicians in its recognition programs and a quality dividend calculator that can estimate the increased productivity and decrease in sick days that are the result of selecting a high-quality health plan. Quality Compass is another tool developed for consumers. This tool contains comprehensive health plan performance data, trend data, and health plan-specific HEDIS rates, in addition to regional and national averages. With Quality Compass, users can track quality improvement, analyze annual plan performance, develop custom reports, and conduct market analyses.

Public Policy

NCQA also maintains an active public policy department. The department works with legislators and policymakers to educate them on how to support healthcare policies that benefit the public. In addition, the NCQA works collaboratively with other organizations to advance policies that improve the efficiency and quality of the healthcare system.

Future Implications

The National Committee for Quality Assurance (NCQA) continues to stimulate significant improvements in healthcare quality through its quality assessment, performance measurement, and physician recognition programs. It is furthering its work by developing a broader set of performance measures and expanding the boundaries of quality. NCQA remains a leader for facilitating change in the nation’s healthcare system by providing employers and consumers with the necessary tools and information to make informed choices.

Jared Lane K. Maeda

See also Healthcare Effectiveness Data and Information Set (HEDIS); Health Maintenance Organizations (HMOs); Health Report Cards; Managed Care; Outcomes Movement; Preferred Provider Organizations (PPO); Quality Indicators; Quality of Healthcare

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Web Sites

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<http://ncqa.org>

NCQA Health Plan Report Card:

<http://reportcard.ncqa.org>

NATIONAL GUIDELINE CLEARINGHOUSE (NGC)

The National Guideline Clearinghouse (NGC) is a federally funded Web site devoted to maintaining a current database of clinical practice guidelines for physicians, other health professionals, and healthcare providers. Specifically, the mission of the NGC is to provide objective, detailed information on clinical practice guidelines and to further their dissemination, implementation, and use. The clearinghouse accomplishes its mission through a number of different components. It provides a searchable database of current clinical practice guidelines, each with an abstract and full-text version (or link to purchase). It offers guideline comparisons—either in the form of automatically generated side-by-side comparisons or novel documents written by the clearinghouse—comparing differences and similarities between guidelines on the same topic. Guidelines and guideline comparisons can be downloaded to personal digital assistants (PDAs) for easy, mobile viewing. The Web site contains an annotated bibliography section that offers a database of clinical-practice-guideline-related resources from peer-reviewed journals and other sources. Finally, it provides a Listserv for discussion of clinical-practice-guideline-related issues and questions.

Background

The initial construction of the NGC began in 1997. To gain input and support for the proposed clearinghouse, individuals in the U.S. Department of Health and Human Services (HHS) met with representatives from the American Medical Association (AMA), the American Association of Health Plans (AAHP), and the U.S. Agency for Health Care Policy and Research (now the Agency for Healthcare Research and Quality, or AHRQ). In December, 1998, the clearinghouse was launched, and it was officially unveiled in January, 1999.

When launched, the clearinghouse included approximately 200 clinical practice guidelines and other related material. By 2000, the number of guidelines had more than tripled to nearly 700. Similarly, the number of visitors to the Web site increased substantially. By the end of the 1st year of its operation, there were more than 17 million hits and 1 million sessions (a "hit" is looking at one page, while a "session" involves multiple concurrent hits).

Usage has continued to increase to approximately 38,000 visits a week. The average user visits about 10 pages and stays for around 6 minutes. Also, the clearinghouse is continuing to grow in size every week—it currently has over 4,000 guidelines available on the Web site.

Clinical Practice Guidelines

Clinical practice guidelines are commonly defined by the national Institute of Medicine (IOM) as "systematically developed statements to assist practitioner and patient decisions about appropriate healthcare for specific clinical circumstances." The number of clinical practice guidelines has greatly increased during the past two decades. This has primarily been due to research studies that showed that physician's practices and treatments vary greatly and to the increase in managed care. The belief is that using clinical practice guidelines can lead to more standardized practice and thus increased quality and cost-effectiveness.

Health Partners, a health insurance company based in Minnesota, found that among its physicians, more than 80 different treatments were being used for bladder infections. To address this

type of substantial variation in treatments, clinical practice guidelines have been developed—in theory care can now be standardized to effective treatment plans. However, the situation is not that simple—in the NGC, there are 13 different guidelines relating to urinary tract infections (including bladder). Physicians must sift through these guidelines to see which one is applicable to their particular patients—since some guidelines may be age or gender specific or may be related to a specific subtype of the condition (chronic urinary tract infection, for example).

A different study looked at the cost-effectiveness of clinical practice guidelines. It found that, among coronary-care intensive-care unit patients, discharging patients according to the established guideline decreased the amount of time spent in the hospital without changing mortality rates or health status at follow-up. This saved an average of \$1,000 per patient.

Development of Guidelines

Historically, one of the major problems with clinical practice guidelines has been the lack of a consistent set of rules used in their development and implementation. To address this problem, the NGC has implemented a number of requirements for inclusion into its database.

Guidelines submitted for inclusion must be current (within the past 5 years). They must include systematically developed statements that help physicians and others make decisions for their patients. They must be developed under the auspices of medical specialty associations; by relevant professional societies, public or private organizations, government agencies at the federal, state, or local level; or by healthcare organizations or plans. Finally, they must be available in English for free or for a fee. Among guidelines submitted to the clearinghouse for inclusion, only about 10% are rejected for not meeting the inclusion criteria.

Additional recommendations for guideline development have been discussed in various journal articles. The articles suggest making a formal cost analysis a part of guidelines, defining evidence and how it was selected, making data available for review, and the use of randomized controlled trials as part of the evidence.

Users of Guidelines

Information on who uses clinical practice guidelines varies based on a number of factors. Among family practitioners, about 60% were at least somewhat familiar with three relevant guidelines; 14% reported not being familiar with any of the three presented guidelines. The use of the guidelines varied based on the guideline, ranging from 44% to 64%. Additionally, staff-model health maintenance organization (HMO) physicians were very likely (100%) to use guidelines, especially as compared with those in private practice (23%).

As for those who use the NGC, it is difficult to know exactly, but most likely nurses and physicians are its greatest users. The majority of hits come during normal business hours, suggesting that healthcare providers may be using it at work or during their practice. It is also believed that younger physicians are using the clearinghouse more than older physicians, because younger physicians are more likely to be trained in information systems and feel more comfortable using the Internet in general.

Issues and Problems

While clinical practice guidelines seem like a good idea in theory, there are often issues and problems in their implementation. These problems include keeping the guidelines up to date with current knowledge, methodological problems with their development, the usefulness of the guidelines to patients with multiple comorbidities, and the problem of physician resistance to using the guidelines in their practices.

Keeping Guidelines Current

With constantly changing research and technology, clinical practice guidelines are also changing. This means that a physician or other healthcare provider may access a guideline, use its recommendations, and later find out that it is already out of date or inaccurate. In addition, depending on the nature of the guidelines, different review criteria might be required. For example, the treatment for ingrown toenails is less dynamic than cancer therapies; therefore, clinical practice guidelines relating to cancer treatment should be reviewed more

frequently than those relating to more established treatments.

One review of 279 clinical practice guidelines found that a large majority (89%) of them failed to include a statement about when they should be reviewed or when they should expire. This becomes problematic because, as previously discussed, without a set date of review; these guidelines might continue to be reviewed long after they have been made current.

Additionally, the time at which a study is published can be a year or more after the data was initially taken. A guideline is partially based on studies, so it may take another year or two before a guideline is published. By the time the guideline is found in the NGC, it may be based on data that are 3 to 4 years old. Thus, when reviewing guidelines (especially ones without a set expiration date), physicians and other healthcare providers should note the dates of the supporting studies and any other dates provided in the guideline.

The NGC works to minimize this problem by requiring all guidelines to have been made current within the past 5 years. It automatically eliminates those that are older from its database, unless there is evidence that it has been or will soon be updated.

Guideline Methodology

Another problem is the consistency in methodology of the guideline development. In a study of 279 clinical practice guidelines, not one of the guidelines met all the criteria set forth by the authors. Most frequently, the guidelines lacked methodological standards such as not disclosing information about how data was obtained, extracted, selected for inclusion, and graded.

One additional problem is implicit value judgments used in the guidelines. Frequently, the authors of guidelines have to make a decision about what the patient is most likely to want. While these decisions may seem relatively obvious, not all patients may share the same values as the researchers. For example, one article cited an example of this problem with the use of aspirin instead of ticlopidine in the treatment of patients with transient ischemic attack (or mini stroke). Aspirin is cheap and available over the counter; however, ticlopidine produces a 15% lower risk of another attack. This lower risk, however, comes at a price—including

monetary, temporal (needing refills and trips to the pharmacy), and bodily (it requires periodic white blood cell counts). The assumption that the authors point out is frequently held by researchers is that the patient would rather take the cheaper over-the-counter aspirin than the more expensive, more effective ticlopidine. While this may be true for most patients, it may not be true in every case. Therefore, clinical practice guidelines should make explicit any implicit value judgments made in the development of the guidelines.

Comorbidities

Guidelines are often written with one medical condition in mind. However, many patients have comorbid conditions or multiple diseases. For example, 48% of Medicare beneficiaries have three or more chronic disease conditions. One study examined this problem explicitly by looking at relevant clinical practice guidelines for a hypothetical 78-year-old woman with five comorbid conditions: osteoporosis, osteoarthritis, Type 2 diabetes, hypertension, and chronic obstructive pulmonary disease (COPD). It found that strictly following all the guidelines would produce drug-disease and drug-drug and drug-food interactions. In addition, the patient would be taking 12 medications (19 doses) per day at five different times. The estimated cost of the drugs would be about \$400 per month.

Strictly following clinical practice guidelines that only focus on one disease can be difficult. It is important to be aware of the limitations of the guidelines in treating patients with comorbidities. In addition, it may be beneficial for future guidelines to address and prioritize comorbidities.

Physician Resistance

Not all physicians are interested in using clinical practice guidelines or the NGC. Some physicians are reluctant because they feel that using guidelines is “cookbook medicine,” which takes away their medical skills. Others are reluctant to use them in everyday practice because they feel comfortable with medical conditions they see on a regular basis; however, they might consult relevant guidelines for preparing presentations, treating complex cases, or in other special situations.

Specialists are most likely to consult clinical practice guidelines in their respective journals. So the NGC may not be as popular as it might, because physicians are already accessing guidelines from different sources. If they hold their own journal in the utmost regard, then they may have no interest in or need for searching for other guidelines from other sources.

Future Implications

Clinical practice guidelines can be beneficial if regularly used and properly developed. With the advent of new technology, it has become possible to centralize information—in this case, in the form of the NGC. The clearinghouse has grown dramatically over the past several years, and it will undoubtedly continue to grow. Additionally, as it grows, so will the number of people who will use it. Currently, there are thousands of visits per week, and this number will grow as knowledge of this database grows.

Clinical practice guidelines were originally developed to standardize practices to more evidence-based interventions and in an attempt to lower costs. It has been shown that these guidelines can accomplish both of these goals given the right conditions. For large change to be realized, guidelines must be appropriately developed (including cost analysis and statements of implicit judgment) and more widely used in practice.

Ultimately, the NGC is a valuable resource for physicians and other healthcare providers. It continues to provide a central access point for current clinical practice guidelines.

John Schrom

See also Agency for Healthcare Research and Quality (AHRQ); Clinical Decision Support; Clinical Practice Guidelines; Evidence-Based Medicine (EBM); Outcomes Movement; Quality of Healthcare; United Kingdom's National Institute for Health and Clinical Excellence (NICE)

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Web Sites

Agency for Healthcare Research and Quality (AHRQ):
<http://www.ahrq.gov>

American Medical Association (AMA):
<http://www.ama-assn.org>

National Guideline Clearinghouse (NGC):
<http://www.guidelines.gov>

NATIONAL HEALTHCARE DISPARITIES REPORT (NHDR)

The *National Healthcare Disparities Report* (NHDR) is a comprehensive overview of the racial, ethnic, and socioeconomic disparities in the access to and quality of healthcare in the nation's general population; among priority populations including women, children, the elderly, racial and ethnic minority groups, low-income groups, and residents of rural areas; and for individuals with special healthcare needs, including the disabled, people in need of long-term care, and people requiring end-of-life care. The federal Healthcare Research and Quality Act of 1999 directed the Agency for Healthcare Research and Quality (AHRQ) to develop an annual NHDR to provide a summary of the state of healthcare disparities in the United States. The first NHDR was released in 2003. The 2004 report built on the first report by providing an updated national overview of disparities and added another critical goal: tracking the nation's progress toward eliminating healthcare disparities.

The 2005 report focused mainly on tracking progress toward eliminating disparities, while the 2006 and 2007 reports focused on healthcare access and quality improvements for different populations across the nation.

Overview

The NHDR is a vital step in the effort to improve healthcare in the United States. By tracking racial, ethnic, and socioeconomic disparities in healthcare access and quality over time, this can increase the general awareness about disparities and inspire action to reduce and/or eliminate them. The NHDR also offers data and analyses that can help researchers, policymakers, clinicians, administrators, and community leaders to monitor the trends, determine areas of greatest need, identify best practices for addressing those needs, and develop new and improved interventions to eliminate healthcare disparities. Additionally, communities and providers can use the NHDR methods and measures to determine the most serious disparities, create targeted interventions, and track progress against national standards.

Key Findings of the Reports

The 2003 Report

The 2003 NHDR presented seven key findings: (1) inequality in quality persists, (2) disparities come at a personal and societal price, (3) differential access to healthcare may lead to disparities in quality, (4) opportunities to provide preventive care are frequently missed, (5) knowledge of why disparities exist is limited, (6) improvement is possible, and (7) data limitations hinder targeted improvement efforts.

Specifically, the report confirmed that there were significant inequalities in healthcare quality in the nation along racial, ethnic, and socioeconomic lines. For example, the report showed that compared with Whites, minorities were more likely to be diagnosed with late-stage breast and colorectal cancer and patients of lower socioeconomic status were less likely to receive recommended diabetic services and were more likely to be hospitalized for diabetes and its complications.

Healthcare disparities were also found to be costly for individuals and for society as a whole. Disparities in quality of care can lead to missed diagnoses and poorly managed care, resulting in avoidable and expensive complications. For individuals, disparities in healthcare can cause disability, lost productivity, and morbidity. For society, treating conditions that have worsened as the result of poor care and/or poor management results in considerable financial costs, notably for taxpayers, who fund public healthcare programs.

Barriers to access to healthcare can also lead to adverse health outcomes. For example, individuals without health insurance coverage or a usual source of care are generally less likely to obtain preventive healthcare services and are more likely to delay seeking needed care. As a result, these individuals are more likely to seek medical care with their illness at later and less treatable stages.

Disparities among population groups were also found to exist in the use of evidence-based preventive services. For example, many racial and ethnic minorities and individuals of lower socioeconomic status were less likely to receive screening and treatment for cardiac risk factors and recommended immunizations.

Findings from the report suggested that targeted efforts could reduce healthcare disparities. For example, community-based cervical cancer screening and outreach programs may be the reason why Black women have higher screening rates for cervical cancer and no evidence of later-stage cervical cancer presentation despite the fact that in general Blacks and the poor are more likely to seek care with later-stage cancers and to have higher death rates.

The 2004 Report

The 2004 NHDR presented three key findings: (1) disparities are pervasive; (2) improvement is possible; and (3) gaps in information exist, particularly for specific medical conditions and populations.

Specifically, the report found that disparities were pervasive in the nation's healthcare system. Disparities affected healthcare across all dimensions of access and quality; across many medical conditions, levels and types of care, and healthcare settings; and within many subpopulations.

The report found that in both 2000 and 2001, Asians, when compared with Whites, received poorer quality of care for approximately 10% of the quality measures and had poorer access to care for approximately one third of the access measures. Also, Blacks, when compared with Whites, received poorer quality of care for approximately two thirds of the quality measures and had poorer access to care for approximately 40% of the access measures.

Several gaps identified in the 2003 NHDR were filled in the 2004 report. These included increased information on hospital care received by American Indians and Alaska Natives; healthcare delivered in community health centers; children with special healthcare needs; and a broader analysis that allowed for the separation of disparities related to race, ethnicity, and socioeconomic status.

The 2005 Report

The 2005 NHDR presented four key findings: (1) disparities still exist, (2) some disparities are diminishing, (3) opportunities for improvement still remain, (4) and information about disparities is improving.

Specifically, the report found that disparities still existed in nearly all aspects of healthcare. Minorities and the poor continued to receive lower-quality healthcare than comparison groups and also had worse access to care. The report found that for racial minorities, more disparities in quality of care were improving than were worsening. The persistence of disparities indicated that opportunities for improvement remained.

The 2006 Report

The 2006 NHDR presented four key findings: (1) disparities still remain; (2) some disparities are decreasing, while others continue to increase; (3) there remain opportunities to reduce disparities; and (4) information on disparities is getting better, but there are still gaps.

Specifically, the report found that minorities and the poor continued to receive poor-quality care and had poor access to care. The report also highlighted that for the poor, most disparities were getting worse. These gaps indicated that ample opportunity existed to continue to improve these

deficient areas and also indicated the need for better data and measures.

The 2007 Report

The 2007 NHDR presented three key findings: (1) disparities in healthcare quality and access are not decreasing, although progress continues to be made; (2) the largest gaps in quality and access are not being reduced; and (3) lack of health insurance coverage continues to be a major barrier to reducing disparities.

Specifically, the report found that although overall progress continues to be made to improve healthcare quality, some of the largest gaps in quality persist. For example, the proportion of Blacks who receive hemodialysis has improved since 2001, and their current rate of treatment is not statistically different from Whites. However, despite the improvement, gaps in health still remain. Blacks were found to have a 10 times higher rate of new AIDS cases than Whites. The report also highlighted that the growing number of uninsured individuals significantly contributes to the problem of poor healthcare quality.

Future Implications

Moving forward, the improvement in available data and the recording of trends in access and the quality of healthcare will enable future NHDRs to identify and lead to decreases in inequities in health. By tracking outcomes and looking at the most vulnerable populations, these reports will continue to serve as important tools in eliminating health disparities.

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See also Access to Healthcare; Agency for Healthcare Research and Quality (AHRQ); Cultural Competency; Ethnic and Racial Barriers to Healthcare; Health Disparities; Healthy People 2010; Vulnerable Populations

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Web Sites

Agency for Healthcare Research and Quality (AHRQ):
<http://www.ahrq.gov>

Families USA: <http://www.familiesusa.org>

Henry J. Kaiser Family Foundation (KFF):
<http://www.kff.org>

NATIONAL HEALTHCARE QUALITY REPORT (NHQR)

The National Healthcare Quality Report (NHQR) is a comprehensive source of information on trends in the quality of healthcare provided to the American people. It is published annually by the U.S. Agency for Healthcare Research and Quality (AHRQ). A key objective of the report is to inform the U.S. Congress and national healthcare policy-makers on quality of care issues as well as to monitor the impact of federal and state changes in healthcare. The report is relevant to health services researchers because they investigate the link between healthcare quality, access, and costs, as well as how the translation of evidence into clinical practice and organizational actions affects outcomes of care.

Background

The idea behind reporting the quality of healthcare to the general public originated towards the end of the 20th century at a time when national discourse on health reform and strategies to improve performance in quality and safety of care had gained momentum. A strategic imperative of

reform called for accountability and transparency as important catalysts to fostering system changes. During the 1990s, a Clinton Presidential Advisory Commission on Consumer Protection and Quality in the Health Care Industry issued a report in 1998 calling for a national commitment from the public and private sectors to improve healthcare quality and reporting. By the end of the decade, the U.S. Congress enacted the Healthcare Research and Quality Act of 1999 directing the AHRQ to publish annual reports that addressed the quality information gap. Around the same period, the National Academy of Sciences, Institute of Medicine (IOM), released two seminal reports on healthcare quality (*To Err Is Human* and *Crossing the Quality Chasm*) that would shape the overall framework of the NHQR.

Framework

The NHQR is anchored on a framework that sets forth the concept of healthcare quality resulting from the dynamic interplay between the organizational delivery system domains and consumer domains of care. The organizational domains correspond to the traits of quality that exemplify effectiveness (giving care based on current scientific knowledge, avoiding overuse or underuse), safety (avoiding harm), timeliness (giving care when needed), and patient-centeredness (giving care that respects patient preferences and values). The consumer domains correspond to the traits of quality that result from obtaining care, which include staying healthy, getting better, managing chronic illness or disability, and coping with end-of-life issues. Thus, quality is indicated by a matrix of the four dimensions of organizational quality and four dimensions of consumer care to exemplify the interdependence between healthcare structures and how outcomes of consumer care influence system performance.

Content Focus

The U.S. Congress stipulates that the NHQR provide information on the relationship between quality, outcomes, access, utilization, and changes over time on frequently occurring clinical conditions, including the impact of federal and state policy changes. In this capacity, the NHQR differs from

other national comparative quality reports because it provides a broad perspective on quality, by assessing progress and defining actions to improve performance across a wide range of provider settings, clinical conditions, and populations. Although the report was commissioned to inform Congress, it also seeks to enhance awareness among policy leaders, purchasers, providers, health professionals, researchers, and the lay public using a chart-book format that highlights key findings and themes to facilitate and encourage the use of data among this audience. Findings of quality outcomes are presented in chapters organized by the four domains of organizational quality, plus appendixes with data tables and measurement specifications for researchers and analysts. The report underscores four basic themes that point to what areas of quality are improving, where variability remains, where progress is strong, and where opportunities for improvement remain, using examples across states and regions by clinical conditions and patient characteristics. It also highlights progress on measures used in national quality initiatives such as Medicare's Quality Improvement Organizations (QIOs) and disease management programs. The NHQR is also published with a companion report, the National Healthcare Disparities Report (NHDR), which emphasizes trends in the quality of healthcare for racial and ethnic minority groups and other vulnerable populations.

Quality Measures

The NHRQ draws on a broad set of quality measures selected based on their importance (e.g., health effects on morbidity and mortality, financial impact), scientific soundness, and feasibility for collection. Quality measures are constructed using various public- and private-sector data sources collected from national and federal data systems, sample data from healthcare facilities and individual providers, population survey data, surveillance and vital statistics data, and health plan data from the Health Employer Data Information System (HEDIS). Each year, the report analyzes 200 to 300 measures, balanced across dimensions of organizational and consumer care, to present information on quality for frequently occurring medical conditions across different populations seeking care and treatment in

acute-, ambulatory-, preventive-, nursing-, home health, and managed-care settings.

Future Direction

While the NHQR is the broadest analysis of longitudinal data on national trends in the quality of healthcare, it remains a work in progress. The analysis of measures has gradually expanded since it was first published in 2003. A major challenge to maintaining its viability as a trustworthy source of information on trends in quality of care hinges on advancements in the field of quality measurement itself. National initiatives to expand measurement across the entire spectrum of medical conditions, populations, and provider settings are likely to remain public policy imperatives for reducing variation in the quality of healthcare for all Americans.

Iris Garcia-Caban

See also Agency for Healthcare Research and Quality (AHRQ); Medical Errors; National Healthcare Disparities Report (NHDR); Outcomes Movement; Patient Safety; Quality Improvement Organizations (QIOs); Quality Indicators; Quality of Healthcare

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Web Sites

- Agency for Healthcare Research and Quality (AHRQ): <http://www.ahrq.gov>

Joint Commission: <http://www.jointcommission.org>
National Healthcare Quality Report (NHRQ): <http://nhqrnet.ahrq.gov/nhqr/jsp/nhqr.jsp>
President's Advisory Commission on Consumer Protection and Quality in the Health Care Industry: <http://www.hcqualitycommission.gov>

NATIONAL HEALTH INSURANCE

National health insurance provides healthcare coverage for all of a country's population against the costs associated with illness and required healthcare. The term also refers to government-financed, guaranteed, and/or mandated health insurance for all citizens. The system, as a rule, is publicly funded from general tax revenues and does not include direct charges to patients such as deductibles or copayments. The various types of national health insurance systems may differ in terms of how they are structured and financed. Some form of national health insurance currently exists in Australia, in Canada, in China, in virtually all of Europe, in New Zealand, and in much of Africa and Asia.

Overview

National health insurance systems begin with the basic assumption that healthcare is an entitlement and a right of citizens and even, in many cases, of residents. It aims to insure all citizens for a comprehensive range of medical and hospital services, generally covering inpatient and outpatient services, physician services, prescription drugs, and many forms of rehabilitation. A national health insurance system places virtually all responsibility for both regulation and financing of healthcare with government. The government sets standards for a core set of benefits that must be included in the healthcare or medical programs, and it provides funding for these services. In a national health insurance system, some private insurance, which is relatively expensive, may be available to individuals who wish to use it as a supplement or, in some cases, as a substitute for the national program. As a supplement, this private insurance may cover those services that are not included in the basic health insurance scheme, such as prescription

drugs, dental and vision services, and certain forms of institutional care. Overall, public sources cover the vast majority of healthcare that may be needed by an individual. In Canada, for example, the national health insurance system represents about 70% of total healthcare spending.

The major features of a national health insurance system include the following: It is universal, covering all citizens; it is comprehensive, covering all conventional medical care including inpatient and outpatient services; it is accessible, with no restrictions on services that are covered or extra charges to patients; it is portable within a country; and it is publicly administered and under the control of government or a nonprofit agency or organization.

In many national health insurance systems, private practitioners provide healthcare services and are paid on a fee-for-service basis. A fee schedule for all services is set each year through negotiations between the government, insurers, and providers. Annual fee increases are determined by the previous year's rate plus an allowance for inflation and increases due to advances in technology and innovation. There are similar negotiated fee schedules for diagnostic tests and referrals to specialists. Most physicians are self-employed in either solo or small-group practices, as are other practitioners such as dentists and pharmacists. In some national health insurance systems, physicians receive an annual salary as employees of the government.

For inpatient services, hospitals are not-for-profit and are overseen by boards of trustees or by a government regulatory agency. They receive an annual global budget, and these funds are expected to cover all care for all the patients in a given year. Institutional care outside the hospital is provided by facilities such as nursing homes and rehabilitation centers, which are reimbursed on a per diem basis.

In a national health insurance system, all citizens have the same public insurance coverage for physician and hospital care, which covers all medically necessary services. Patients have free choice of any provider in the system (which is virtually all physicians). While other industrialized countries, including the United States, rely on patient cost-sharing arrangements such as deductibles and copayments, most national health insurance systems have elected not to use these methods for cost

containment. As a result, there are not direct costs to seeking care for those covered by a national health insurance system. Under this type of system, primary care is the foundation of healthcare, and patients are encouraged, though not required, to visit their primary-care physician rather than seeking a specialist directly. Eighty-five percent of Canadians, for example, have a primary-care physician whom they see on a regular basis. Specialists receive a larger fee for their services when a primary-care physician refers their patients to them. This practice encourages providers to direct patients to use their generalist appropriately.

In a healthcare system organized around national health insurance, every individual who is covered is issued an insurance or medical card. Consumers present this card when they visit the physician or the hospital; the provider, in turn, submits charges to the government or agency administering the system for reimbursement. For the basic set of medical services covered by public insurance, no further paperwork is required by either the patient or the physician. For care received in a hospital, the hospital is responsible for managing the resources allocated for each case to keep within its annual global budget. Additional paperwork may be required for supplemental services that are insured privately.

This basic public insurance for physician and hospital services includes only limited coverage for a variety of supplemental health benefits, and the majority of these supplemental services are paid for through private insurance or out-of-pocket payment by patients. Those services that are not fully covered by the public insurance scheme include prescription drugs, dental care, vision care, medical equipment and appliances, independent living arrangements for the disabled and the services of allied health professionals. While some public coverage for these services is available in limited cases, the rates of coverage vary on a case-by-case basis. In some countries, for example, the coverage and rates vary by geographic region or area. Because of this, supplemental health benefits are often funded through private health insurance or through additional allocations by regional or local governments. In many cases, these costs for additional or supplemental services have been rising, as they are not subject to the same price bargaining structures as physicians' fees and hospital costs.

National Health Insurance in Context

National health insurance can best be understood by examining the different methods for financing and organizing healthcare systems. There are three basic sets of institutional relationships in different healthcare systems: reimbursement, contractual, and integrated. The reimbursement system, which is usually combined with fee-for-service payments, is common in countries with a mix of public and private insurers and providers, including Canada, Germany, Japan, and the United States. The contract system is found in social insurance systems, as in the Netherlands, which has predominantly private, nonprofit providers. It involves an agreement between providers and third-party payers to impose limits on the total amount and distribution of spending. Contract agreements typically include global prospective budgets for hospitals and rules for reimbursement, including per diem or capitation payments. Integrated systems combine into one agency the funding for as well as the provision of health services. Health professionals are usually salaried employees, and agency budgets serve to control spending. Public integrated health systems are found in the United Kingdom and the Scandinavian countries.

In general, countries combine these relationships in the healthcare system through social insurance or public health services. Social insurance countries finance healthcare from general taxation or from compulsory payroll and employer contributions. Employment-based taxes often provide the financing for nonprofit "sickness funds" that then reimburse providers for services. There are two broad types of integrated public systems: those that are nationally integrated, such as the United Kingdom's National Health Service (NHS); and those that are organized at the local level through the counties, as in Scandinavia.

Similarities and Differences With the U.S. System

The United States does not have a comprehensive healthcare system that provides a core set of services to all citizens. Instead, some form of national health insurance is provided to the elderly through the nation's Medicare program, to low-income and

disabled persons through the state-administered Medicaid program, to veterans through the Veterans Health Administration (VHA), and to low-income children through the State Children's Health Insurance Program (SCHIP). These American programs are remarkably similar to national health insurance programs in countries such as Australia, Canada, England, and New Zealand, in terms of their organization and financing. Some of the administrative or organizational relationships, such as the federal/state partnerships, are similar to those in Canada.

In Canada, as in the United States, most physicians operate in private practice. Unlike the U.S. model, however, all Canadian physicians are part of the same insurance program. The benefit of this model for the Canadian system is two-fold: a single fee schedule can be negotiated for all providers in each province; and the risks and benefits of participation are spread among all physicians.

Some, though not all, of the cost-control mechanisms used in many national health insurance systems are also common in U.S. public and private insurance programs. The most notable exception to this is the fact that the Canadian system does not use point-of-care patient cost-sharing mechanisms such as deductibles and copayments, as do most U.S. private insurers and, increasingly, Medicaid and Medicare plans. The global budgeting scheme used for payment to hospitals in Canada is different from the U.S. Medicare's Diagnosis Related Groups (DRGs) mechanism used to control the costs of an episode of hospital care. The global budget arrangement in Canada is perhaps somewhat more labor-intensive for the hospital because it requires overall planning for all patient encounters in a year rather than the immediate resource management for each individual episode of care required by DRGs.

U.S. managed-care organizations typically pay providers through a capitation arrangement, where payments are made on a per-patient basis. Rather than capitation, however, physicians in many national health insurance systems are paid on a fee-for-service basis for each patient encounter; these fees are negotiated in advance, however, and are much lower than in the United States, even under capitation schemes.

The most striking difference is the breadth of coverage offered by most national health insurance

systems. Between 90% and 95% of citizens in these systems are insured by public health insurance, and in most cases the government will pay for care provided to patients regardless of whether they have an insurance card. As a result, physicians do not incur financial risk by caring for uninsured patients, as is the case in the United States.

Administrative Costs and Cost Controls

Estimates of administrative costs in national health insurance systems range from less than 1% to rates similar to those of U.S. private insurers, which is roughly 20%. These studies attempt to take into account additional sources of overhead not included in the lower estimates, such as the hidden costs of tax-based financing and patient-time costs. Notwithstanding such attempts to uncover real but hidden costs of national health insurance systems, administrative costs of these healthcare systems are significantly lower than those in the United States.

Two components at play in these systems appear to be key to achieving administrative efficiency. First, a macromanagement approach to cost control sets and enforces overall budgetary limits on hospitals and clinics. Being a single-payer system saves time and cost for both the coverage party, either the government or a not-for-profit agency, and the provider, by having a single billing system. Second, by setting global budgets, rather than itemizing charges and then billing for each encounter with each individual patient, the system reduces the amount of time and personnel needed for administration.

Waiting Lists

Waiting lists, or queues, are a concern for consumers in national health insurance systems and for American policymakers looking at these systems. Waiting times for certain procedures are longer in many of the national health insurance countries than they are in the United States. This issue is a source of anxiety for Canadian patients, for example, as well as a difficult planning concern for its policymakers. In response, the Canadian province of Ontario operates a waiting list management program, which uses guidelines that include indicators of severity and urgency to place patients in

appropriate rank order. Studies suggest that those with more severe or urgent conditions do experience shorter waiting times.

It is difficult to get accurate data on the average waiting times for nonemergency procedures in Canada because there are separate waiting lists for each category of procedure, and there have been no organized efforts to collect data on waiting times until recently. These recent efforts include a survey of people in Canada and four other countries that shows that the average waiting time for elective surgery was more than 1 month, with 27% of people surveyed indicating that they had waited more than 4 months.

Some analyses also suggest that mortality rates for people waiting for coronary artery bypass graft are actually lower than expected mortality rates for cardiac patients generally, which indicates that the waiting list management system has been successful at identifying and rapidly treating those patients whose cardiac disease requires immediate attention.

Studies have found waiting times to be longer in Canada than in the United States for a variety of elective surgeries. For example, in a study of knee replacement comparing a large sample of American Medicare patients to Canadian patients, researchers found that the average waiting time was twice as long in Canada. The waiting period for the initial orthopedic consultation was 4 weeks, as compared with 2 weeks in the United States; the waiting period for the knee replacement surgery was 8 weeks, as compared with 3 weeks in the United States. The study found no differences in overall satisfaction with the surgery between the two groups.

The type of rationing embodied by waiting lists also applies to other types of high-technology healthcare services, such as the use of magnetic resonance imaging (MRI) machines. National health insurance systems usually set limits on the number of MRI machines that will be available, and it plans where they will be available geographically. In 2004 there were 4 times more MRI machines per million in the United States than in Canada (19.5 vs. 4.6). In this case, too, there does appear to be a rational process based on medical need and urgency that determines the patient's placement in the queue and ultimate receipt of services.

Waiting lists for elective procedures are often considered a source of cost control in Canada because they can reduce use and therefore spending, but they do not appear to be a large source of the overall spending differential with the United States. The procedures for which the waiting lists in Canada are the longest account for a very small proportion, approximately 3%, of overall spending in both the United States and Canada.

Costs and Benefits

Overall, it is very difficult to assess the costs and benefits of a national health insurance system as compared with a system that is a mix of public and private insurance or with one dominated by private health insurance. Some of the benefits of national health insurance include universal or near-universal coverage, predictable overall costs for the healthcare system, affordability for consumers, equity across user groups, efficiency in the allocation and use of resources, and provision of comprehensive care in inpatient and outpatient settings. The costs of this system include rationing of care, waiting lists, relatively high taxes for citizens, and restrictions on the types of care that will be covered. These costs and benefits will be assessed and balanced in different ways depending on the objectives government, consumers, and providers want to achieve.

From another perspective, it is almost impossible politically in most national health insurance systems to cut benefits, even with the cost pressures facing most systems. It would violate the principles of universality and solidarity that are associated with these systems. On the other hand, the national insurance model makes it possible to eliminate, or nearly eliminate, the administrative costs that are associated with multiple payers. The national health insurance model has considerable leverage in bargaining with providers.

As a result of affordable access to healthcare services for all citizens, Canadians enjoy very good health relative to people in other industrialized nations, including the United States. In a study comparing 13 of the world's major industrial countries using a total of 16 health indicators, Canada ranked 3rd on average, while the United States ranked 12th. The 13 countries included Australia, Belgium, Canada, Denmark, Finland, France,

Germany, Japan, the Netherlands, Spain, Sweden, the United Kingdom, and the United States. In other words, national health insurance systems appear to produce very positive health outcomes.

What many Americans find appealing about national health insurance systems such as those found in Australia, Canada, and the United Kingdom is that they eliminate insecurity about the availability of health insurance and the potential for financial ruin caused by illness. The systems also contain costs, with a smaller proportion of total economic activity devoted to healthcare, as compared with the current system in the United States.

Lessons to Be Learned

What can we learn from a national healthcare system, such as the Canadian system, whose fundamental philosophical and organizational principles are so different from our own? Perhaps more than one might at first glance think. As already noted, the United States already has various healthcare insurance programs that are universal in nature; these programs focus on specific groups of people and not the population as a whole, though.

The United States should evaluate what can be learned from national health insurance systems and the policy challenges they face in the context of a crisis of expectations. Americans want access to high-quality healthcare that offers choice among providers at relatively low costs without any type of rationing in the form of queues or waiting times. In other words, they want high-quality healthcare on demand and they want to be empowered to make their own selection of providers and treatments based on the best medical information available. Existing national health insurance systems provide some good examples and some promise that such expectations can be met under a national system. These systems, as a whole, have managed to insure all citizens for a comprehensive range of medical and hospital services, while also containing medical costs. However, there are fundamental philosophical barriers to adopting such a system in the United States, and this is where the crisis of expectations becomes most apparent. Canada, for example, has been successful in creating a relatively low-cost, easy-access healthcare system that includes a great deal of choice and only moderate

waiting times. But it has done so through governmental power and control. American consumers also want their healthcare system to be relatively free of government regulation. To this extent, national health insurance may be beyond the scope of possible reform options.

However, if Americans see that they could actually spend less on healthcare, this attitude may begin to change. For example, the United States now spends approximately the same percentage of its gross domestic product (GDP) on public health insurance programs as other industrialized countries, about 7%. The United States uses that percentage to cover a small portion of people, while the other countries are able to cover all their citizens with the same amount. The U.S. spends another 7%, or \$800 billion, for private insurance, and the number of uninsured American has grown to 47.5 million.

Other dimensions of quality and patients' experiences help assess how desirable national health insurance may or may not be in the United States. Waiting times for U.S. patients with insurance are less than those for most Canadians who do not have life-threatening conditions. The longest waits and greatest anxiety are experienced by American patients who do not have health insurance coverage, although one solution to this well-documented disparity would be a system that afforded more complete coverage to all Americans.

Universal health insurance means providing insurance to all, not necessarily requiring that everyone share the same system. What is essential in this type of system is that health insurance provide coverage to all people in comparable terms. Since 1985, tension between consumers, providers, and third-party payers, including government, has been growing over which goals or objectives to maximize. The tensions are reflected in the vexing task of balancing cost containment, quality assurance, and freedom of choice for consumers and providers. Systems of national health insurance offer some important lessons for the United States on each of these critical dimensions.

Robert F. Rich

See also Access to Healthcare; Healthcare Reform; Health Services Research in Canada; International Health Systems; Public Policy; Rationing Healthcare; Single-Payer System; United Kingdom's National Health Service (NHS)

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Web Sites

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- Physicians for a National Health Program (PNHP): <http://www.pnhp.org>
- Universal Health Care Action Network (UHCAN): <http://www.uhcan.org>
- World Health Organization (WHO): <http://www.who.int>

NATIONAL HEALTH POLICY FORUM (NHPF)

The National Health Policy Forum (NHPF), created in 1971, is a think tank that provides current research and information to senior staff in the U.S. Congress and executive agencies in an objective format and that offers an opportunity to discuss complex health issues in a private setting. It was founded based on a recognized need to provide accurate, unbiased information to senior

congressional staff and administrators of executive agencies in Washington, D.C.

Health policy issues often contain many layers and require complex decisions for policymakers. The NHPF offers a nonpartisan exchange of information, thus providing policymakers with an opportunity to sort through the complex layers to make accurate and informed decisions. The forum itself does not take positions on specific health issues, but rather, provides objective information based on research and data to policymakers. It works to promote understanding of complex health issues and foster decision making. The NHPF is affiliated with George Washington University.

Organizational Structure

The NHPF consists of a staff of 19 people who produce resources for policymakers and the general public. The forum's employees have strong backgrounds in federal government, which provides an understanding of not only the governmental process, but also the exact types of issues and decisions faced by policymakers.

The forum's director is responsible for overseeing the activities of the staff. The director serves as a resource not only to the staff, but to policymakers and funding bodies as well. The director is responsible for the direction of the educational activities provided to federal policymakers. The forum's deputy director coordinates grant writing and reporting activities, daily operations, and programming.

In addition, the NHPF has a publications director, who serves as editor for all publications produced by the forum and guides production of print materials, visuals, and the forum's Web site. Research associates are assigned to conduct research and analysis of specific health issues. The health issues addressed by research associates range from healthcare provider issues, aging services, and long-term care to health-care safety net and public health issues. Research associates conduct research, analyze the results, and write reports about their assigned health issues.

Activities and Services

The NHPF produces several types of resources including issue briefs, background papers, and short briefs about programs and practices called "the Basics." Materials categorized under this sec-

tion aim to provide a basic introduction to a health topic. Issue briefs are short reports analyzing a variety of health-related topics and issues, whereas background papers provide a more in-depth examination of a major health issue, looking at the history, theory, and the various positions of a topic.

The NHPF also conducts meetings and workshops on a regular basis for researchers, policymakers, leaders in the healthcare industry, and consumers. Participants attend these events on an invitation-only basis. Forum meetings provide an opportunity for leaders and decision makers in health policy to come together to discuss health issues in an off-the-record setting. A specific health topic is designated for each forum session. An expert speaker or panel presents current information relevant to the designated topic. In addition to regularly scheduled forum sessions, senior congressional staff may request briefings on specific health issues. These briefings offer more in-depth analysis and discussion of a topic. The forum makes materials and handouts from these sessions available on its Web site.

The forum's Web site provides users with access to the same health policy information that is provided to policymakers. Information and materials including issue briefs, background papers, site visit reports, and meeting archives are grouped by content area. The Web site includes information about aging and long-term care, behavioral health, children's health, coverage and access, federalism, Medicaid, Medicare, pharmaceuticals, private markets, public health and preparedness, quality, research and technology, and welfare.

The NHPF also provides access to papers produced by the Health Insurance Reform Project (HIRP) on its Web site. The HIRP, another non-profit, nonpartisan organization working as an independent voice in the health policy arena, strives to improve the health insurance and healthcare industries by monitoring trends and policy. While it is also affiliated with George Washington University, HIRP is separate from the forum.

The forum also coordinates site visits for federal policymakers. Site visits are held throughout the country to showcase innovative programs and to demonstrate how local health communities deal with specific issues. Recent site visits addressed topics relating to senior citizen health and housing, rural health systems, health records, access to care, and quality of care.

Funding

The NHPF is supported by grants and financial contributions from several foundations and corporations. While 98% of its funding comes from a number of private foundations such as the W. K. Kellogg Foundation and the Robert Wood Johnson Foundation, approximately 2% of its revenue comes from corporate contributions from health insurance companies, pharmaceutical companies, and other private corporations.

Kristin Hartsaw

See also Child Care; Long-Term Care; Medicaid; Medicare; Pharmaceutical Industry; Public Health; Public Policy; Technology Assessment

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Web Site

National Health Policy Forum (NHPF):
<http://www.nhpf.org>

NATIONAL HEALTH SERVICE CORPS (NHSC)

The National Health Service Corps (NHSC) is a federal program that recruits primary healthcare professionals to serve in designated Health Professional Shortage Areas (HPSAs). The Corps enlists primary-care physicians and other healthcare practitioners with scholarships and education loan repayment plans that require work in underserved areas of the nation. In FY2007, the program's budget was \$125 million.

Background

The U.S. Congress created the NHSC in 1970 with the passage of the Emergency Health Personnel Act (PL 91-623) in response to the increasing geographic imbalance in access to primary care. By the end of the 1960s, rural areas suffered shortages of physicians as existing physicians retired and new ones preferred practicing in less remote areas. Innercity urban areas also were experiencing the loss of physicians and other healthcare professionals.

To identify areas of need, the federal government broadly defines and specifically identifies HPSAs. These areas have a shortage of primary-medical-care, dental, or mental health providers and may be geographic (a county or service area), demographic (low-income population), or institutional (comprehensive health center, federally qualified healthcare center, or other public facility). Specific shortage areas are designated by the Secretary of the Department of Health and Human Services (HHS). Currently, there are over 5,000 designated shortage areas in the nation. These shortage areas encompass about 50 million Americans, or 20% of the U.S. population.

Organizational Structure

The NHSC program is managed by the U.S. Department of Health and Human Services, Health Resources and Services Administration's Bureau of Health Professions (BHPr). The program has a national advisory council, which comprises 15 clinicians and healthcare administrators. The council identifies priorities, suggests and analyzes policy changes, and generally advises possible improvements in access to primary care through the program to the Secretary of the HHS and the Administrator of the Health Resources and Services Administration (HRSA).

Scholarship and Loan Programs

Under the NHSC Scholarship Program, student recruits agree to serve 1 year as a salaried professional in an approved underserved area after graduation for each year that they received the full tuition scholarship. After their commitment, scholarship

recipients may enter private practice wherever they wish, but the hope is that they will stay in the underserved area. The scholarships are available to U.S. citizens studying to be allopathic or osteopathic physicians, dentists, nurse practitioners, physician assistants, nurse midwives, and other specific healthcare professionals.

The NHSC Loan Repayment Program, added in 1987, allows healthcare professionals to join the Corps and practice in an underserved area in exchange for repayment of a portion of their educational loans. Both newly graduated as well as seasoned professionals are eligible. The loan repayment program contracts require a minimum 2-year commitment to the placement site, and recipients may be able to extend the assignment to gain further loan repayment. Newly graduated or seasoned professionals are eligible, but must be U.S. citizens and be licensed and/or certified (depending on the profession). Specifically, eligible professionals include allopathic and osteopathic physicians, primary-care certified nurse practitioners, certified nurse-midwives, primary-care physician assistants, general-practice dentists, registered clinical dental hygienists, health service psychologists, licensed clinical social workers, psychiatric nurse specialists, marriage and family therapists, and licensed professional counselors.

Other Programs

The NHSC also recruits professionals to serve on a basis other than to repay obligations of a scholarship or for loan repayment. One such recruiting effort is the Rapid Response Program. Rapid responders, all primary-care professionals, serve as U.S. Public Health Service (USPHS) commissioned officers for 3 years in a medically underserved area and receive training to be part of a mobile team available in case of a large scale or national emergency.

Additionally, the NHSC also runs the Ambassador Program, which is composed of volunteers on college and university campuses or in communities. The Ambassador Program is composed of about 650 members. College Ambassadors help promote careers in primary care and inform, recruit, and support interested students. Community Ambassadors also help recruit clinicians and provide mentorship and support for Corps members.

Program Success

Since its inception, the NHSC has supported over 27,000 health professional recruits in every state, territory, and possession of the United States. In 2007, the program had 4,600 health professionals working in underserved urban and rural areas, with 50% serving in community health centers. They serve 5 million people. As part of its mission, the Corps hopes that its members will continue to practice in underserved communities once they have fulfilled their obligatory service. Records show that many Corps members do not stay at their original placement site, leaving the impression that access in underserved areas is not dramatically improved in the long term. However, further studies reveal that, although these professionals do not necessarily stay in their original placement site, many do go to other underserved areas to practice. Over 75% of those who repay their loans continue to work in underserved areas, while just over 60% of scholarship recipients remain.

Ruth Ann Althaus

See also Access to Healthcare; Health Professional Shortage Areas (HPSAs); Health Resources and Services Administration (HRSA); Primary Care; Public Health; Rural Health; Vulnerable Populations

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Web Sites

- Association of American Medical Colleges (AAMC): <http://www.aamc.org>
- National Association of Community Health Centers (NACHC): <http://www.nachc.com>

National Health Service Corps (NHSC): <http://nhsc.bhpr.hrsa.gov>

U.S. Public Health Service (USPHS): <http://www.usphs.gov>

NATIONAL INFORMATION CENTER ON HEALTH SERVICES RESEARCH AND HEALTH CARE TECHNOLOGY (NICHSR)

The National Information Center on Health Services Research and Health Care Technology (NICHSR) was established by the federal National Institute of Health Revitalization Act of 1993 (PL 103–43). A unit of the National Library of Medicine (NLM), the NICHSR has the broad mission of improving the collection, storage, analysis, retrieval, and dissemination of information on health services research, clinical practice guidelines, and healthcare technology, including the assessment of such technology. The NICHSR has a professional staff of six, including librarians and a health data standards specialist. It reports to the director of the NLM.

Goals

The overall goals of the NICHSR are as follows: (a) to make the results of health services research, including clinical practice guidelines and technology assessments, readily available to health practitioners, healthcare administrators, health policymakers, payers, and the information professionals who serve these groups; (b) to improve access to data and information needed by the creators of health services research; and (c) to contribute to the information infrastructure needed to foster patient record systems that can produce useful health services research data as a by-product of providing healthcare.

Health services research is a multidisciplinary field; its research domains include individuals, families, organizations, institutions, and communities. As a result, evidence from health services research is spread through a variety of sources, often making it difficult for health professionals, healthcare administrators, and health policymakers

to find the information needed to guide their decision making. It is the role of the NICHSR to meet this need by coordinating the development and management of information resources and services at the NLM in the fields of health services research and public health.

Databases

An important aspect of this role is the selection of health services literature for the NLM's collection, including both published research and grey literature (e.g., material that is not found through conventional channels such as recent technical reports and working papers from research groups or committees). This function is coordinated jointly through the NICHSR, the Literature Selection Technical Review Committee (LSTRC), and the NLM's Technical Services Division. This bibliographic information used to reside in a separate database known as HealthSTAR, but in 2000, it was integrated with other NLM resources. It is now available in the following ways: (a) journal citations are added weekly to the NLM's PubMed; (b) books, book chapters, technical reports, and conference papers are added regularly to the NLM's online catalog, LocatorPlus; and (c) meeting abstracts from AcademyHealth (formerly the Academy for Health Services Research and Health Policy and the Association for Health Services Research) and Health Technology Assessment International (HTAi) (formerly known as the International Society of Technology Assessment in Health Care) are accessible through the NLM Gateway.

In addition to these resources, the NICHSR coordinates the development and maintenance of databases related to health services research. Available databases include the following: (a) HSTAT, a free, Web-based resource of full-text documents that provide health information and support healthcare decision making; (b) HSRProj, a database of citations to research-in-progress funded by federal and state agencies and foundation grants and contracts; and (c) Health Services and Sciences Research Resources (HSRR), a free searchable catalog of research databases, survey instruments, and software relevant to health services research, behavioral and social sciences, and public health. The HSRProj became available in 1995. It builds on a

database developed by the staff of AcademyHealth and the Cecil G. Sheps Center for Health Services Research at the University of North Carolina at Chapel Hill. Finally, the NLM's Directory of Information Resources On-line, known as DIRLINE, has a special subfile covering health services research organizations, including those involved in technology assessment and development of clinical practice guidelines.

Recent Activities

In 2005, the NICHSR launched the HSR Information Central, a Web portal designed to centralize access to health services research information. The HSR Information Central was developed with input from the Agency for Healthcare Research and Quality (AHRQ), the National Cancer Institute (NCI), the Health Services Research and Development Service (HSR&D) at the Veterans Administration, and other organizations. A librarian evaluates each link on the HSR Information Central before it is added to the site, and users of the site are encouraged to submit additional Web links via the "Suggest-a-Link" form available at the site.

In addition to its online databases, the NICHSR and other NLM staff develop guides, fact sheets, bibliographies, and other products targeted to health services researchers. The NICHSR has developed classes and other training materials designed to assist health sciences librarians in providing health services research to their patrons. Core library recommendations have been developed for the areas of health services research methodology, health outcomes, health economics, and health policy. These lists include books, journals, and Web sites and are intended to guide individuals unfamiliar with the subject area. The NICHSR has also created online self-study courses, such as "Finding and Using Health Statistics," "Introduction to Health Care Technology Assessment," and "Health Economics Information Resources."

The NICHSR collaborates with NLM units and with members of the National Network of Libraries of Medicine to exhibit NLM products and services and to present training classes at national meetings of health services research-related organizations. The NICHSR, along with other NLM staff, is an active participant in Partners in Information Access

for the Public Health Workforce. This initiative works to improve information for public health working professionals. Other partners include the Agency for Healthcare Research and Quality (AHRQ), the American Public Health Association (APHA), the Association of Schools of Public Health (ASPH), the Association of State and Territorial Health Officials (ASTHO), the Centers for Disease Control and Prevention (CDC), the Health Resources and Services Administration (HRSA), the Medical Library Association (MLA), the National Association of County and City Health Officials (NACCHO), the National Network of Libraries of Medicine (NN/LM), the Public Health Foundation (PHF), and the Society for Public Health Education (SOPHE). The NICHSR also works closely with the AHRQ and other organizations to improve the dissemination of the results of health services research.

Future Implications

The passage of the federal Health Insurance Portability and Accountability Act of 1996 (HIPAA) created new challenges for health services research, focusing on computer-based patient records, security, and privacy standards. Recent research and development efforts at the NICHSR have focused on the expansion of the Unified Medical Language Systems' Metathesaurus to improve its utility in creating and retrieving computer-based patient records, as well as the funding of extramural research and evaluation involving the creation and use of computer-based patient records.

Susan Jacobson and Catherine Selden

See also Agency for Healthcare Research and Quality (AHRQ); Health Communication; Healthcare Web Sites; Health Informatics; Health Services Research, Origins; Health Services Research Journals; National Institutes of Health (NIH); Technology Assessment

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Web Sites

National Information Center on Health Services Research and Health Care Technology (NICHSR): <http://www.nlm.nih.gov/nichsr>

National Library of Medicine (NLM): <http://www.nlm.nih.gov>

Partners in Information Access for the Public Health Workforce: <http://phpartners.org>

NATIONAL INSTITUTES OF HEALTH (NIH)

The National Institutes of Health (NIH) is the principal federal agency responsible for overseeing and financially supporting health-related and biomedical research. It funds and oversees research conducted within the United States as well as research conducted internationally. The primary goal of the NIH is to promote health and prevent disease through health-related research that provides significant insights and solutions to these problems. The NIH is regarded as one of the world's leading biomedical research centers and it is the hub of medical research activity in the nation. Researchers at the NIH are at the forefront of finding ways to prevent, treat, and cure diseases as well as find the causes of rare and common diseases. The NIH works to improve the health of people in the United States and save the lives of millions.

The NIH consists of 20 institutes and 7 centers, each with its own specific areas of research and resources of health information. The NIH is 1 of 11 U.S. Public Health Service Agencies of the U.S. Department of Health and Human Services (HHS). The NIH's headquarters and main campus are located in Bethesda, Maryland, with satellite sites across the nation. In 2007, NIH had a staff of more than 18,000 employees and a budget of nearly \$28 billion. Additionally, more than 83% of the NIH's funds were awarded through competitive grants and contracts to over 325,000 researchers located at universities, medical schools, and research institutions throughout the nation and the world.

History

The political and historical context has contributed to the multifaceted organization of the NIH's institutes, centers, and offices and their myriad roles and responsibilities. The NIH began in 1887 with one research scientist, Joseph J. Kinyoun, working in a one-room laboratory within the Marine Hospital Service (MHS). As a physician he was authorized to create the Hygienic Laboratory located at Staten Island, New York. The Hygienic Laboratory was primarily used to conduct bacteriological research focusing on screening for infectious diseases such as cholera among merchant seamen and officers of the U.S. Navy. As a result, research activities were limited to biological investigations, and they did not address other factors affecting the public's health.

During the early 20th century, the general public increasingly believed in the usefulness of science to advance the health of Americans, which provided numerous opportunities to expand the roles and responsibilities of the Hygienic Laboratory. A series of legislative events prompted the transformation of the Hygienic Laboratory into a federal agency responsible for the nation's health.

In 1930, the Hygienic Laboratory was officially renamed the National Institute of Health, and it was authorized to provide research training fellowships through the passage of the Ransdell Act (PL 71-251). The U.S. Congress passed the Public Health Service Act (PL 78-410) in 1944, which gave the U.S. Surgeon General of the Public Health Service (PHS) increasing authority to fund research

studies and designated the newly established National Cancer Institute (NCI) as an Institute of the NIH. Accordingly, the NIH gradually began to enlarge its facilities and research funding mechanisms. The NCI was already authorized by the U.S. Congress in 1937 through the National Cancer Institute Act (PL 75-244) to provide research funds to nonfederal workers and to sponsor research training fellowships outside of the organization. As the other institutes were established, between 1948 and 2000, the thriving NCI grants and research training programs continued to expand. Funding for the NIH grew tremendously during this time period, from \$2.5 million in 1944 to more than \$1 billion in 1966. And NIH funding has continued to expand.

Overview

Over the decades, the significant work of the NIH has resulted in numerous important discoveries and medical treatments that have saved the lives of many, increased the life expectancy of the nation's population, and improved the quality of life of individuals. The NIH has been able to translate research findings into interventions that have benefited the general public, patients, and their families. Furthermore, the outcomes of the NIH's research have resulted in decreased death rates from heart disease, stroke, HIV/AIDS, and sudden infant death syndrome (SIDS); the increased survival rate of childhood cancer patients; and prevention of the spread of infectious diseases through vaccinations.

In addition to conducting cutting-edge research that has transformed medical science, the NIH also provides funding and training opportunities. All its institutes support research, funding, and training opportunities for research scientists in a variety of settings such as hospitals, universities, and laboratories. The NIH centers also provide and coordinate resources that facilitate intensive research training and development of a strong national research infrastructure. Under the guidance of the Office of the Director, the 27 institutes and centers aim to meet the four stated overarching goals of the NIH: (1) to foster fundamental creative discoveries, innovative research strategies, and their applications as a basis to advance the nation's capacity to protect and improve health significantly; (2) to

develop, maintain, and renew scientific human and physical resources that will ensure the nation's capability to prevent disease; (3) to expand the knowledge base in medical and associated sciences in order to enhance the nation's economic well-being and ensure a continued high return on the public investment in research; and (4) to exemplify and promote the highest level of scientific integrity, public accountability, and social responsibility in the conduct of science. The establishment of these institutes reflects the direction of present scientific discoveries and societal needs. Specifically, the NIH concentrates its research agenda and educational efforts on input from expert researchers and clinicians, patient advocacy and grassroots organizations, and representatives from the U.S. Congress.

With federal funds, the NIH supports intramural and extramural research studies in which both types of studies undergo a careful process of scientific review before investigation, and they follow strict guidelines throughout the research process. Intramural research activities are conducted in NIH laboratories and at the NIH Clinical Center at its main campus in Bethesda. Seven major NIH Inter-Institute Scientific Interest Groups are organized by the NIH Office of Intramural Research and offer training opportunities and expert guidance for junior researchers. The NIH Office of Extramural Research (OER) develops and implements NIH grants, policies, and guidelines primarily for university investigators. The NIH awards funds to external organizations to help accomplish its program goals through research grants, cooperative agreements, and contracts.

In FY2006, approximately 50,000 research grants were awarded through the OER. Grant applications and cooperative agreements are subject to a system of two separate peer reviews. One is a scientific assessment, and the second is an evaluation of the first assessment as well as resource funding allocations.

Contracts are reviewed under a separate process including a request for proposals (RFP) based on the needs of the specific institute. RFPs are reviewed by peer reviewers and NIH staff reviewers. The offers that are deemed the most beneficial to the public are awarded contracts. The peer review system constructs a foundation of decision making based on scientific integrity and responsibility regarding the federal stewardship of funds.

Institutes

The NIH comprises 20 different institutes that work to accomplish its overarching goals. Each institute is briefly discussed below.

National Cancer Institute

The National Cancer Institute (NCI) was established in 1937 to conduct and support research concerning the cause, diagnosis, prevention, and treatment of cancer and to regularly provide federal cancer statistics. Of all the institutes at the NIH, the NCI has the largest budget, at nearly \$4.7 billion. The NCI publishes a large number of articles, books, and other material on various types of cancer, treatment options, clinical trials, coping with cancer, testing for cancer, nutrition, and cancer risk factors.

National Eye Institute

The National Eye Institute (NEI) was established in 1968 to conduct and support vision research to prevent and treat visual impairment and blindness. The NEI conducts public educational programs through its National Eye Health Education Program. The NEI publications include information about eye diseases and disorders and eye care resources.

National Heart, Lung, and Blood Institute

The National Heart, Lung, and Blood Institute (NHLBI), established in 1948, fosters and furthers research on cardiovascular diseases as well as sleep disorders. The NHLBI publications include health assessment and educational resources for patients, clinicians, and researchers.

National Human Genome Research Institute

The National Human Genome Research Institute (NHGRI) was established in 1989 to represent the work of the NIH on the International Human Genome Project (IHGP). After the successful completion of the IHGP in 2003, the NHGRI continues to conduct and support human genome research. The NHGRI educational resources include a Human Genome Project CD and genetics and genomics education resources for the public.

National Institute on Aging

The National Institute on Aging (NIA), created in 1974, is focused on better understanding the aging process through scientific research. Currently, the NIA funds external research studies on the biology of aging, behavioral research, neuroscience, and geriatrics and gerontology. The NIA's publications include information related to healthy aging, medications, safety, Alzheimer's disease, health conditions related to aging, and care giving.

National Institute on Alcohol Abuse and Alcoholism

The National Institute on Alcohol Abuse and Alcoholism (NIAAA) was established in 1970 to conduct and support research on the causal factors, diagnosis, prevention, and treatment of alcohol-related conditions. The NIAAA's publications include the journal *Alcohol Research and Health*, professional education materials for researchers and clinicians, and pamphlets and brochures on alcohol-related topics for the public.

National Institute of Allergy and Infectious Diseases

National Institute of Allergy and Infectious Diseases (NIAID), which focuses on research on infectious, immunologic, and allergic diseases, was established in 1948. The NIAID strategic plan for the 21st century includes further investigation of allergic diseases and asthma, autoimmune diseases (e.g., Type 1 diabetes, rheumatoid arthritis, and multiple sclerosis), HIV/AIDS, tuberculosis, malaria, influenza, hepatitis, and bioterrorism.

National Institute of Arthritis and Musculoskeletal and Skin Diseases

The National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS), created in 1986, examines and supports research on the causal factors, diagnosis, prevention, and treatment of arthritis and musculoskeletal and skin diseases. The NIAMS' Information Clearinghouse provides health information for professionals and the general public.

National Institute of Biomedical Imaging and Bioengineering

The National Institute of Biomedical Imaging and Bioengineering (NIBIB) is the most recently established institute. Since 2000, it has worked to foster the study of biomedical technology and engineering. Currently, the NIBIB supports external research studies on biomaterials, biomedical informatics, biomedical and medical imaging, nanotechnology, nuclear medicine, tissue engineering, and ultrasound.

National Institute of Child Health and Human Development

The National Institute of Child Health and Human Development (NICHD) was established in 1962 to conduct and support the study of infants, children, and their families and human development across the lifespan. The NICHD currently supports external research studies on developmental biology and perinatal medicine, reproductive health, child development, and pediatric and maternal HIV/AIDS. It also sponsors health campaigns to target problems such as autism, obesity, and sudden infant death syndrome (SIDS).

National Institute on Deafness and Other Communication Disorders

Since its inception in 1988, the National Institute on Deafness and Other Communication Disorders (NIDCD) has focused on the study of communication disorders. Currently, the NIDCD is conducting research studies on human communication and genetics, sensory and signal transduction mechanisms, and physiological and developmental studies of the inner ear.

National Institute of Dental and Craniofacial Research

The National Institute of Dental and Craniofacial Research (NIDCR) was established in 1948 to conduct and support research on the causal factors, diagnosis, prevention, and treatment of craniofacial-oral-dental diseases and disorders. The NIDCR is currently conducting research studies on genomics and proteomics, as well as the repair and

regeneration of tissues related to craniofacial-oral-dental diseases and disorders.

National Institute of Diabetes and Digestive and Kidney Diseases

The National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK), established in 1948, supports and conducts research on the study of diabetes as well as endocrine, metabolic, digestive, kidney, urologic, and hematologic diseases. The NIDDK clearinghouse provides publications for patients and researchers on diabetes and digestive, kidney, and urologic diseases.

National Institute on Drug Abuse

Established in 1973, the National Institute on Drug Abuse (NIDA) works to advance research on the causal factors, diagnosis, prevention, and treatment of drug abuse and addiction. The NIDA provides a vast array of prevention and treatment resources to healthcare providers, researchers, parents, and teachers, as well as to students and young adults. Currently, the NIDA supports external research studies on treatment for drug disorders, drug abuse aspects of HIV/AIDS, genetics and genomics of drug addiction, and prescription drug abuse.

National Institute of Environmental Health Sciences

The National Institute of Environmental Health Sciences (NIEHS) was created in 1969 to conduct and support the study of environmental factors and causes related to health and illness. The NIEHS 2006–2011 Strategic Plan includes goals to increase the understanding of environmental influences related to human biology and to expand clinical research programs on environmental exposures.

National Institute of General Medical Sciences

The National Institute of General Medical Sciences (NIGMS), active since 1962, focuses on the study of biomedical sciences for understanding the pathways of disease diagnosis, prevention, and treatment. The NIGMS funds studies on bioinformatics and computational biology; cell biology and biophysics; structural genomics and proteomics

technology; genetics and developmental biology; and pharmacology, physiology, and biological chemistry.

National Institute of Mental Health

The National Institute of Mental Health (NIMH) is charged with advancing research on the causal factors, diagnosis, prevention, and treatment of mental illness. It was established in 1949. Currently, the NIMH funds external research studies on basic neuroscience and behavioral science, adult and pediatric mental disorders, biobehavioral processes related to HIV/AIDS transmission and infection, and mental health interventions.

National Institute of Neurological Disorders and Stroke

The National Institute of Neurological Disorders and Stroke (NINDS), created in 1950, conducts and fosters research on the causal factors, diagnosis, prevention, and treatment of neurological disease and stroke. The NINDS areas of neuroscience research include, but are not limited to, the structure and functioning of the nervous system through examining neural circuits, neural environment, neurodegeneration, and neurogenetics.

National Institute of Nursing Research

Since 1986, the National Institute of Nursing Research (NINR) has focused its efforts on nursing research among individuals, families, communities, and populations. Currently, the NINR areas of research emphasis include improving health promotion and quality of life, eliminating health disparities, and advancing end-of-life research.

National Library of Medicine

The National Library of Medicine (NLM), established in 1956, strives to advance the study of biomedical informatics and communications. The NLM is located at the NIH headquarters in Bethesda, Maryland, and serves as the world's largest medical library. The NLM's online databases, such as PubMed/Medline, include biomedical publications from thousands of journals; MedlinePlus serves as a resource for health information for professionals and the general public.

Centers

In addition to its 20 institutes, the NIH houses 7 research centers. Each center is briefly discussed below.

Center for Information Technology

The Center for Information Technology (CIT) has been working to develop computer systems, provide computer facilities, and conduct computational research since its creation in 1964. The CIT supports NIH's institutes with information technology, computing, and telecommunications services. For example, the CIT's Division of Computational Bioscience applies technologies to biomedical applications such as biomedical informatics and medical imaging.

Center for Scientific Review

The Center for Scientific Review (CSR), which was established in 1946, recruits and organizes expert peer reviewers into study sections to evaluate the research grant applications sent to the NIH. These external experts are recruited nationally and represent the areas of expertise needed to effectively decide on funding of the most promising research activities.

John E. Fogarty International Center

The John E. Fogarty International Center (FIC) was established in 1968 to promote and support research on global health. Currently, the FIC funds research studies in the developing world on brain disorders, maternal and child health, and infectious diseases, such as HIV/AIDS and tuberculosis. It also supports international research partnerships.

National Center for Complementary and Alternative Medicine

In 1999, the NIH created the National Center for Complementary and Alternative Medicine (NCCAM) to focus on complementary and alternative medical (CAM) practices and training efforts. Currently, the NCCAM areas of research emphasis include mind-body medicine practices, pharmaceutical and pharmacokinetic properties of

CAM products, energy medicine, traditional/indigenous practices, and ethical and social issues related to the use of CAM.

National Center on Minority Health and Health Disparities

The National Center on Minority Health and Health Disparities (NCMHD), established in 1993, conducts and supports research to improve minority health and eliminate health disparities. Currently, the NCMHD provides loan repayment funds for researchers working in minority health and health disparities research, as well as for those who are developing external research training programs and centers.

National Center for Research Resources

The National Center for Research Resources (NCRR), created in 1962, provides researchers with biomedical resources as well as technological support to develop successful clinical research environments. Currently, the NCRR focuses on providing support in biomedical technology, clinical research, comparative medicine, and research infrastructure.

NIH Clinical Center

Originally established as a research hospital facility in 1953, the NIH Clinical Center (CC) supports clinical research conducted by all the NIH institutes and centers. Admission to the CC is selective and based on NIH study objectives. The CC also provides numerous training opportunities to researchers through lectures and computer-based training as well as fellowship programs.

Future Implications

For more than a century, the NIH has been responsible for improving the nation's health through biomedical and behavioral research. The NIH continues its important work of discovering new knowledge to improve the nation's health through its ambitious research agenda. Additionally, through its institutes and centers, the NIH strives to provide resources and expertise in the broad spectrum of clinical medicine and public health. The NIH furthers its goals by sponsoring research,

fellowships, training, and infrastructure development. Through the translation of biomedical research discoveries into means of disease prevention and improvements in clinical outcomes, reduction in the individual and societal burden of disease is being achieved.

Michelle Choi Wu

See also Acute and Chronic Diseases; Centers for Disease Control and Prevention (CDC); Cohort Studies; Community-Based Participatory Research (CBPR); Health Disparities; Mortality, Major Causes in the United States; National Information Center on Health Services Research and Health Care Technology (NICHSR); Randomized Controlled Trials (RCT)

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- National Institutes of Health, Office of Extramural Research: <http://grants.nih.gov/grants/oer.htm>
- National Institutes of Health, Research and Training Opportunities: <http://www.training.nih.gov>

NATIONAL MEDICAL ASSOCIATION (NMA)

The National Medical Association (NMA) promotes the collective interests of physicians and patients of African descent and other minority and underserved populations in the United States. The association carries out this mission by serving as the collective voice of Black physicians. It is a leading force for parity in medicine, the elimination of health disparities, and the promotion of optimal health.

History

The National Medical Association was founded in the fall of 1895 at the Cotton States and International Exposition in Atlanta, Georgia, after a group of Black physicians were denied admission into the American Medical Association (AMA). In a climate of segregation, the National Medical Association was founded to provide an organization for Black physicians and health professionals. Robert F. Boyd of Nashville, Tennessee, served as the association's first president.

The main priority for the first National Medical Association's agenda was how to improve the health of the nation's Black population, which exceeded 10 million in 1912, and increase the number of Black physicians to adequately serve the health of that population. The association's members worked on these priorities by opening hospitals with an emphasis on physician training and by studying the major diseases contracted by Blacks, such as tuberculosis, hookworm, and pellagra.

In 1909, the first issue of the *Journal of the National Medical Association* was published. Charles V. Roman served as the journal's first editor. From its beginning, the journal focused on scholarly research and findings regarding the treatment, management, and prevention of illness and disease.

In the 1940s, the National Medical Association continued its efforts to eliminate discrimination in the nation's hospitals and medical schools. In 1951, the association was responsible for several segregated medical schools located in the South and nearby states beginning to admit Black students. Within a 10-year period, the number of Black students attending these medical schools

doubled. By the 1960s, 14 of the 26 southern medical schools admitted Black students.

In 1957, the first Imhotep National Conference on Hospital Integration was held. This annual meeting was sponsored by the National Medical Association, the National Association for the Advancement of Colored People (NAACP), the National Urban League, and the Medico-Chirurgical Society of the District of Columbia (an affiliate of the National Medical Association). This conference was successfully used as a platform to disseminate strategies to foster the elimination of segregation in healthcare.

During the turbulent 1960s, the National Medical Association was a viable force in the nation's civil rights movement. The association advocated for civil rights by coordinating sit-ins, marches, and picket lines and by lobbying to pass a federal civil rights act. It supported Martin Luther King Jr.'s efforts to register voters in Selma, Alabama, which ultimately led to the passage of the Civil Rights Act of 1965. The passage of this act was instrumental in giving Blacks hope of improving their health status by outlawing discrimination in government-funded health programs. In particular, the act assured them access to healthcare through Medicare and Medicaid programs, and the professional staffs and patient populations at hospitals were desegregated.

Activities

Currently, the National Medical Association represents more than 30,000 Black physicians and their patients. The association continues to publish the *Journal of the National Medical Association* monthly, the quarterly *Healthy Living* newsletter, targeted to physicians and patients, and the e-newsletter *NMA News*. It also publishes the *Convention Daily News*, which is available at the association's Annual Convention and Scientific Assembly, where about 1,000 scientific sessions are held.

The association offers many continuing medical education (CME) courses at its national assembly as well as at regional, state, and local society meetings offered in its 33 state and 98 local affiliated medical societies. All its courses are accredited by the Accreditation Council for Continuing Medical Education.

The National Medical Association sponsors a wide range of externally funded programs. These include the Smoking Cessation Program, the National Diabetes Education Program (cosponsored with the U.S. Department of Health and Human Services' National Diabetes Education Program [NDEP]), the Clinical Trials Project Impact program to increase minority physicians and consumer awareness and participation in clinical trials, and the Black Bag Mentoring program to facilitate African American residents' and students' access to practicing physicians.

In 2004, the association formed The W. Montague Cobb/National Medical Association Health Institute. The focus of the institute is to identify, develop, and implement solutions that will reduce racial and ethnic health disparities and improve the health of all Americans. The institute has four centers: (1) the Multicultural Health Center; (2) the Research, Surveillance and Professional Education Center; (3) the Community/Public Media Information Center; (4) and the Mobilization and Advocacy Center.

The association holds an annual National Colloquium on African American Health to foster its advocacy mission by offering programs to train healthcare leaders to address and eliminate health disparities of Blacks, other minorities, the poor, and the medically underserved.

The National Medical Association's advocacy efforts are continued through its International Affairs Committee, which serves as a resource to assist and enhance association members' participation in medical missions around the world. In addition, association members' spouses formed the Auxiliary to the National Medical Association. The auxiliary's current efforts consist of developing and promoting a National Auxiliary Program on Health, Education, and Legislation.

The association also supports the Student National Medical Association (SNMA). Started in 1964 by medical students from Howard University College of Medicine and Meharry Medical College, the Student Medical Association currently has over 5,000 members, including medical students, pre-medical students, residents, and physicians. Its primary focus is the needs and concerns of medical students of color, although its efforts include encouraging elementary, high school, and college students to consider and prepare for medical and scientific careers. The National Medical Association

also provides a Career Center to assist in the employment and recruitment of minorities into medical professions.

Ophelia T. Morey

See also Diversity in Healthcare Management; Ethnic and Racial Barriers to Healthcare; Health Disparities; Health Workforce; National Healthcare Disparities Report (NHDR); Physicians; Vulnerable Populations

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<http://www.anmanet.org>

National Medical Association (NMA):
<http://www.nmanet.org>

Student National Medical Association (SNMA):
<http://www.snma.org>

NATIONAL PATIENT SAFETY GOALS (NPSG)

The Joint Commission's National Patient Safety Goals (NPSG) address problematic areas in healthcare by using evidence- and expert-based solutions. The NPSG are composed of implementation expectations and requirements for Joint Commission-accredited organizations. Where possible, the goals focus on systemwide improvements. The goals are program specific and apply variously to ambulatory care, office-based surgery, behavioral healthcare, critical-access hospitals, disease-specific care, home care, hospitals, laboratories, long-term care, integrated delivery systems, managed-care organizations, and preferred provider organizations (PPOs). All Joint Commission-accredited healthcare organizations are expected to implement the goals or approved alternatives to the services the organization provides in order to obtain or maintain their accreditation. The first goals were approved in 2002 and have been updated annually since then.

Development of the Goals

Formed in February 2002, the Sentinel Event Advisory Group (SEAG), a panel of patient safety experts including nurses, physicians, pharmacists, risk managers, and other professionals, oversees the development and improvement of the NPSG and implementation requirements. Each year, the SEAG works with the Joint Commission staff to identify potential new goals and requirements through a systematic review of the relevant literature and information from available patient safety incident databases, such as the Joint Commission's Sentinel Event Database and the U.S. Pharmacopeia's Medmarx Database. Once potential goals are identified, input is sought from practitioners, provider organizations, purchasers, consumers, and patient advocacy groups. The SEAG then determines the highest-priority goals and requirements and makes its recommendations to the Joint Commission. To maintain the focus of accredited organizations on the most salient patient safety issues, the SEAG may recommend the retirement of selected goals or requirements. Retired goals or

requirements will usually continue as accreditation requirements under the relevant accreditation standards. The gaps in goal numbering indicate that a goal has been retired.

Specifically, the 2008 NPSG goals for hospitals were as follows:

Goal 1: Improve the accuracy of patient identification.

Goal 2: Improve the effectiveness of communication among caregivers.

Goal 3: Improve the safety of using medications.

Goal 7: Reduce the risk of healthcare-associated infections.

Goal 8: Accurately and completely reconcile medications across the continuum of care.

Goal 9: Reduce the risk of patient harm resulting from falls.

Goal 10: Reduce the risk of influenza and pneumococcal disease in institutionalized older adults.

Goal 11: Reduce the risk of surgical fires.

Goal 12: Implement the applicable NPSG and associated requirements by components and practitioner sites.

Goal 13: Encourage patients' active involvement in their own care as a patient safety strategy.

Goal 14: Prevent healthcare-associated pressure ulcers (decubitus ulcers).

Goal 15: Identify safety risks inherent in its patient population.

Goal 16: Improve recognition and response to changes in a patient's condition.

Last, the organization fulfills the expectations set forth in the Universal Protocol for preventing wrong-site, wrong-procedure, and wrong-person surgery, and associated implementation guidelines.

Challenges in Meeting the Goals

Depending on the goal, healthcare organizations may face various system, resource, personnel, behavioral, and/or cultural barriers to goal implementation. Some goals have been consistently criticized for the added burden they place on an

already overstretched system. For example, Goal 8, the "medication reconciliation" goal, calls for healthcare organizations to obtain an accurate list of medications from patients and to define a process to ensure that information is accurately communicated from provider to provider. The intent of the goal is to prevent patient safety incidents involving adverse drug events by ensuring that healthcare providers have accurate patient medication information so that the provider can effectively care for the patient. However, inordinate attention has been paid to documentation or "obtaining the list," and therefore, the intent of the goal is sometimes lost. Organizations that have successfully implemented medication reconciliation programs are those that have integrated the practice of medication reconciliation into existing processes and then worked to refine those processes to eliminate duplication and redundancy. Organizations that struggle with implementing medication reconciliation are those that tend to add these processes on to existing systems without considering the potential implications of doing so.

Future Implications

The NPSG focus attention on problematic areas in healthcare. Successful implementation of the goals is challenging for healthcare organizations, given the complexity of organizational systems, resources, personnel, and cultures. There are no one-size-fits-all solutions, and there is only emerging research that supports the effectiveness of some of the goals. Because the goals are intended to prevent patient harm and improve safety, the Joint Commission will continue in these efforts despite the difficulties in implementation.

Gerard M. Castro

See also Adverse Drug Events; Hospitals; Institute for Healthcare Improvement (IHI); International Classification for Patient Safety (ICPS); Joint Commission; Medical Errors; Patient Safety; Quality of Healthcare

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- Joint Commission’s Sentinel Event Advisory Group (SEAG): <http://www.jointcommission.org/SentinelEvents/AdvisoryGroup>

NATIONAL PRACTITIONER DATA BANK (NPDB)

Administered by the Health Resources and Services Administration (HRSA), the National Practitioner Data Bank (NPDB) is a federal information clearinghouse responsible for receiving, storing, and disseminating information about medical malpractice payments and adverse actions taken against healthcare practitioners. Established under the Health Care Quality Improvement Act of 1986, the NPDB began collecting data on September 1, 1990. The purpose of the data bank is to improve medical-care quality and safety by restricting the ability of incompetent physicians, dentists, and other practitioners to move from state to state without the disclosure of previous medical malpractice payments and adverse actions. The NPDB is intended to be an alert system that facilitates a comprehensive review of a healthcare practitioner’s professional credentials.

Types of Reports

The NPDB receives six types of reports: (1) medical malpractice payments made on behalf of a practitioner, (2) licensure actions taken by state

medical and dental boards, (3) professional review actions taken by hospitals and other healthcare entities exercising significant peer review activities, (4) professional society membership actions, (5) actions taken by the U.S. Drug Enforcement Administration (DEA), and (6) Medicare and Medicaid exclusions. Medical-malpractice payments are the most common type of report received by the NPDB. Since its inception, the NPDB has received about 320,000 medical malpractice reports, which represent about 75% of all reports. State licensure actions are the next most common type of report, at 14%, followed by Medicare and Medicaid exclusion at 8.0% and clinical privileging actions at about 4%. Professional society membership and DEA actions make up less than 0.5% of all reports in the data bank.

Types of Providers Covered

While the NPDB covers a wide variety of medical practitioners, physicians are those most often reported to the data bank. Physicians make up approximately 70% of all practitioners reported to the data bank. Dentists make up the next largest group, at 13%, followed by nurses and nursing-related practitioners, who account for 9%, and chiropractors, who represent about 3% of those practitioners reported.

Types of Entities Reporting

Just as there are a variety of types of reports in the NPDB, there are also a variety of entities providing those reports. Any entity that makes a medical malpractice payment on behalf of a practitioner for full or partial settlement of a claim or judgment must submit a report to the NPDB. In general, medical malpractice reports are made by insurers or carriers; however, these reports may also be filed by other types of organizations that make such payments. Self-insured hospitals, physician groups, and managed-care organizations can also file reports. State medical and dental boards are required to report state licensure disciplinary actions related to professional competence or conduct. Other professional boards are not required to report to the data bank. Any hospital or other healthcare entity that takes a professional review action that restricts or suspends the clinical

privileges of a physician or dentist for more than 30 days must report that action to the NPDB. Physicians and dentists may voluntarily surrender or restrict their clinical privileges while being investigated for possible professional incompetence or improper professional conduct in return for suspension of the investigation. In these cases, the healthcare entity must also file a report. This situation is considered a reportable clinical privileging action. Clinical privilege actions for other practitioners may also be reported, but these reports are not required. Professional societies are required to report membership actions taken for reasons related to professional competence. The DEA provides up-to-date information on revocations and voluntary surrenders of its registration numbers. Finally, Medicare and Medicaid exclusions are publicly available through the *Federal Register* and do not require a specific reporting entity.

Federal agencies are not subject to the provisions of the Health Care Quality Improvement Act of 1986. The Secretary of the U.S. Department of Health and Human Services (HHS) signed separate memoranda of understanding with various federal departments to ensure their participation in the NPDB program. The Secretary signed memoranda of understanding with the U.S. Department of Defense (DOD) in 1987, the DEA in 1988, and the U.S. Department of Veterans Affairs (VA) in 1990. Other memoranda of understanding include ones with the U.S. Public Health Service (PHS), signed in 1989 and 1990, and with the U.S. Coast Guard and the U.S. Department of Justice, Bureau of Prisons, signed in 1994. Under those memoranda of understanding, 257 medical malpractice cases were reported to the NPDB through 2005.

Access to Information

The only entities that are required to access information from the NPDB are hospitals. According to the authorizing legislation, all hospitals are required to query the data bank when a physician initially applies for employment or membership on their medical staff, and at least every 2 years thereafter. Other entities that exercise significant peer review, such as managed-care organizations and physician groups, may also query the data bank.

Healthcare practitioners may self-query the data bank about themselves at any time. A practitioner may dispute the accuracy of a report in the data bank or the fact that the report should have been filed. If the dispute between the practitioner and the report is not resolved, the practitioner may ultimately request a review of the report by the Secretary of the HHS.

Research and Impact

A great deal of research on the NPDB has focused on using the longitudinal, national data set to provide information on trends in medical malpractice claims. For example, one study compared 2001–2004 median anesthesia malpractice payments with those for a similar period a decade earlier and documented a 28% decrease in the number of anesthesia-related payments per 100,000 population but a substantial increase in the median payment amount from \$69,330 to \$205,222.

While studies focusing on medical malpractice payments are most common, a few studies of trends in adverse actions have also been published. These studies tend to focus on the lack of reporting in this area. For example, one research study documented that between 1991 and 1995 only 34% of hospitals reported one or more clinical privileging actions against a physician. In addition, the annual rate of reporting to the data bank for these types of actions actually fell over the period, from 12% in 1991 to 10% in 1995. Subsequent studies by the Office of the Inspector General (OIG) of the HHS found that 60% of hospitals and 84% of health maintenance organizations (HMOs) had not reported a single adverse action to the data bank in almost 10 years of data collection.

A number of studies have focused on the quality and usefulness of the data housed in the data bank. The studies determined that, in general, querying entities found the reports in the data bank useful because they confirmed information received from other sources, although they did not often change the credentialing decision of the entity. However, the studies also found a low level of completeness of data in the data bank.

Another important area of research has been the potential impact of the NPDB on medical malpractice claim settlements and adverse actions. A number of researchers and policymakers have

hypothesized that in the face of the reporting requirements of the NPDB, individuals and organizations may take steps to avoid settlements or reportable adverse actions. This assumption is because a report to a federal data bank is considered onerous, notwithstanding that hospitals require physicians to submit the same information and the NPDB essentially serves as a check on physician honesty. Because of this perceived burden, some have suggested that 29-day clinical privilege suspensions, which are not reportable, are one major explanation for the limited reporting of adverse clinical privileging actions.

In the arena of medical malpractice payments, the practice of corporate shielding has become an issue of major concern to policymakers. Because medical malpractice payments on behalf of institutions are not reportable to the NPDB, some have suggested that attorneys may be working out arrangements to name institutions, such as hospitals and corporate physician groups, rather than individual physicians, in final settlements in order to avoid reportable physician payments. This practice may be responsible for the unexpectedly lower number of medical malpractice reports to the NPDB. However, a study of physician medical malpractice claim settlements before and after implementation of the NPDB found that physicians and insurers were significantly less likely to settle claims since the introduction of the NPDB, especially those less than \$50,000.

Future Implications

Given the current view that quality and safety in healthcare are the responsibility of the healthcare system rather than any single individual, the approach of the NPDB may be antiquated because it focuses on incompetent practitioners. However, at this point in time, a number of factors suggest that the NPDB plays an important ongoing role in quality assurance. While hospitals are required to query the NPDB when credentialing physicians, many hospitals routinely use the data bank, asking questions that are not required, as part of their credentialing process. It is also important to note that the ideal healthcare system is not yet attainable. Fragmentation and poor communication are and will remain a reality for many years to come, and information clearinghouses that facilitate the

flow of information in the presence of those deficiencies will continue to play an important role in safeguarding the interests of both patients and providers.

Teresa M. Waters and Peter P. Budetti

See also American Medical Association (AMA); Credentialing; Health Resources and Services Administration (HRSA); Malpractice; Medical Errors; Physicians; Quality of Healthcare

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NATIONAL QUALITY FORUM (NQF)

The National Quality Forum (NQF) is charged with planning, developing, establishing, and coordinating voluntary consensus standards for healthcare quality, measurement, and reporting through a formal, structured consensus development process. Located in Washington, D.C., the NQF is a private, nonprofit organization with open membership that represents a unique consortium of over 350 public and private healthcare-related organizations including federal agencies, healthcare providers, consumers/patients, purchasers, industry, and other stakeholders. In this capacity

the NQF has significant influence over healthcare policy decisions made at the federal level.

Background

In 1996, President Clinton created the U.S. Advisory Commission on Consumer Protection and Quality in the Health Care Industry. The commission was given the broad charge of investigating the changes occurring in the nation's healthcare system and recommending measures to promote and ensure healthcare quality and value and protect consumers and workers in the healthcare system. In 1998, the commission's final report recommended the creation of a public-private forum for healthcare quality measurement and reporting to focus incentives for quality improvement on national priorities while ensuring the public availability of information needed to support the marketplace and oversight efforts. By May 1999, the Quality Forum Planning Committee had put in place the structure needed to establish the National Forum for Health Care Quality Measurement and Reporting, now known as the NQF, as a voluntary consensus standard-setting body. The NQF, empowered by the federal National Technology Transfer and Advancement Act of 1995 and the Office of Management and Budget (OMB) Circular A-119, sets standards for the U.S. Department of Health and Human Services (HHS), the Centers for Medicare and Medicaid Services (CMS), and the Agency for Healthcare Research and Quality (AHRQ).

Organizational Structure

The NQF is governed by a board of directors composed of individuals from its diverse membership. The NQF members are organized into various member councils including the following: consumer council; health plan council; health professional council; provider organization council; public/community health agency council; purchase council; quality measurement, research, and improvement council; and supplier/industry council. These councils contribute expertise to the development of standards and vote on the endorsement of national consensus standards.

Functions

The NQF's primary activities fall into three categories: (1) consensus development process; (2) national healthcare priority setting and other convening functions; and (3) leadership, education, and award activities. Each of the categories is discussed below.

Consensus Development Process

The consensus development process is the formal process the NQF uses to develop and endorse voluntary national consensus standards. Projects that undergo the consensus development process may be suggested by the NQF's members, member councils, staff, and board of directors or by external entities. These projects must be consistent with NQF priorities.

Specifically, the consensus development process consists of five steps: (1) consensus standard development; (2) widespread review; (3) member voting; (4) consensus standards approval committee action and the board of directors' endorsement; (5) and evaluation. At the initiation of the consensus development process, a steering committee is formed to oversee, advise, and ensure that input is obtained from relevant parties. Steering committees reflect the diversity of the NQF membership and may also include technical advisors as needed. The measure developer (or steward) assumes responsibility for submission of candidate standards and updates to endorsed standards and provides input as requested to the deliberations of the steering committee. An NQF project officer guides this process and acts as the liaison between the committee and the NQF.

The consensus standard development procedure results in draft recommendations that are based on those of the steering committee. They are reviewed, edited, and approved by the steering committee. And the steering committee must reach a consensus before the draft recommendations can proceed for further review, with all dissenting views documented. Explicit description of the scientific base for the draft recommendations is required. Widespread review begins with NQF member and public prevailing review of the draft recommendations. Members, member councils, and the public have the opportunity to comment

prior to initiation of voting. Based on the comments of members and the general public, the NQF staff may revise the draft recommendations and circulate such revisions to the steering committee for additional review prior to preparing the recommendations for voting. All comments are made available to members when voting on the draft recommendations. All members are given the opportunity to vote on the draft recommendations. Members may approve the recommendations, propose modifications and/or conditions, or vote not to approve the recommendations. All results are then forwarded to the consensus standard approval committee for consideration. That committee may approve the standard or recommend a second round of voting. The board of directors will affirm or overturn the actions of the consensus standard approval committee. Recommendations endorsed by the board of directors are designated as NQF-endorsed consensus standards. Members and the public have the opportunity to appeal an endorsement, and an appeal will be given due process review by the appropriate committees. The board of directors will then act on the appeal by responding with a rationale for maintaining or repealing the endorsement. Since its inception, the NQF has endorsed over 200 consensus standards, ranging from adult diabetes to safe practices for better healthcare.

National Healthcare Priority Setting and Other Convening Functions

The NQF is involved in numerous priority-setting activities designed to improve the quality of healthcare in the nation. One example, establishing safe healthcare practices, includes efforts in therapeutic drug management, cancer care, substance abuse, and healthcare-associated infections. The NQF is also involved in setting priorities for public reporting improvement, payment strategies, information technology, and healthcare system performance. These efforts include examination of patient safety incidence classification, pay-for-performance, electronic medical records, and healthcare equity, effectiveness, and efficiency. To obtain key stakeholder and member input as well as to inform the public, the NQF convenes high-level meetings and conferences regularly.

Leadership, Education, and Award Activities

The NQF recognizes individuals and healthcare organizations that have significantly contributed to the improvement of quality and the safety of care. The NQF and *Modern Healthcare* acknowledge the exemplary performances that have effectively used performance measurements to drive change across various settings and times, fostered a transparent and accountable culture aimed at rebuilding the social contract between healthcare and the community, and increased the expected level of a health system's performance in the areas of quality and safety with the National Quality Healthcare Award. In collaboration with the Joint Commission, the NQF presents the John M. Eisenberg Patient Safety and Quality Award annually to individuals and healthcare organizations that have made significant contributions to enhancing patient safety through performing research and providing service reflective of patients' needs and perspectives. Honorees are acknowledged for individual achievement, research, advocacy, and system innovation at the organizational, local, regional, and national levels.

Future Implications

The NQF, recognized as one of the principal organizations for quality and safety improvement in the nation, endorses consensus-driven healthcare standards, and develops national strategies for healthcare improvement. Through these major areas, the NQF will likely continue to influence the nation's future healthcare policy and promote system improvement and consumer/patient understanding.

Gerard M. Castro

See also Clinical Practice Guidelines; Hospitals; Joint Commission; Medical Errors; Patient Safety; Public Policy; Quality Indicators; Quality of Healthcare

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<http://www.qualityforum.org>
- U.S. Advisory Commission on Consumer Protection and Quality in the Health Care Industry:
<http://www.hcqualitycommission.gov>

NAYLOR, C. DAVID

C. David Naylor is the president of the University of Toronto. He is an internationally recognized leader in the fields of health services research, evidence-based medicine, and health policy.

Naylor received a medical degree from the University of Toronto in 1978 with scholarships in medicine, surgery, and pediatrics. As a Rhodes Scholar at Oxford University in the Faculty of Social and Administrative Studies, he earned a doctoral degree in 1983. Subsequently, he trained in general internal medicine at the University of Western Ontario and then for a year in Toronto as a Medical Research Council of Canada (MRC) fellow in clinical epidemiology.

Prior to becoming the president of the University of Toronto, Naylor was the dean of medicine and Vice Provost of Relations With Health Care Institutions at the University of Toronto. Previously, he was a senior scientist of the Medical Research Council of Canada (MRC). Naylor also developed and led a research program in clinical epidemiology

at the Sunnybrook Health Science Centre in Toronto and was responsible for developing the Institute for Clinical Evaluative Sciences, where he was the inaugural chief executive officer. In addition, he was one of the founding architects of Ontario's Cardiac Care Network.

Naylor has authored or coauthored over 300 publications in diverse fields such as social history, public policy, epidemiology, biostatistics, and health economics, as well as clinical and health services research in most fields of medicine. He has been the driving force behind developing a capacity for multidisciplinary health research in Canada and was on the national task force that established the framework for the Canadian Institutes of Health Research (CIHR). In 2003, Naylor chaired the National Advisory Committee on SARS and Public Health. This Committee's report led to the creation of the Public Health Agency of Canada, to increased commitments to public health at the national level, and to the appointment of Canada's first chief public health officer.

In addition to publishing frequently cited papers, Naylor has served on several editorial boards, including the *Journal of the American Medical Association*, the *British Medical Journal*, and the *Canadian Medical Association Journal*.

Naylor's service has been recognized through major national and international awards for research and leadership in medicine, including the John Dinham Cottrell medal by the Royal Australasian College of Physicians, the Malcolm Brown award by the Royal College of Physicians and Surgeons, the Michael Smith award by the Medical Research Council, and the Research Achievement award by the Canadian Cardiovascular Society. Most recently, he was appointed a fellow of the Royal Society of Canada.

Gregory S. Finlayson

See also Academic Medical Centers; Epidemiology; Evidence-Based Medicine (EBM); Health Services Research in Canada; Infectious Diseases; Public Health; Public Policy

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- Public Health Agency of Canada (PHAC): http://www.phac-aspc.gc.ca/new_e.html
- University of Toronto: <http://www.utoronto.ca>

NEWHOUSE, JOSEPH P.

Joseph P. Newhouse is a preeminent health economist. He has published extensively in the fields of health economics, health policy, and health services research. He also has trained many health economists.

Born in 1942 in Waterloo, Iowa, Newhouse earned a bachelor's degree and doctoral degree in economics from Harvard University. In 1963–1964, he was a Fulbright Scholar at the Johann Wolfgang von Goethe University at Frankfurt am Main in the Federal Republic of Germany.

Since the early 1970s, Newhouse has been a leading researcher, public servant, and scholar in health economics and health policy. He conceived and carried out significant, and in some cases unique, research projects; his research spans such

diverse areas as health insurance incentives, health-care payment systems, healthcare costs, health technology, risk adjustment, medical malpractice, and the impact of poor health habits. While at the RAND Corporation (1968–1988), he markedly expanded its health research and health policy expertise. Most notable was the RAND Health Insurance Experiment (HIE), one of the largest social science experiments in U.S. history. In leading the HIE, Newhouse oversaw an unprecedented research effort for more than 15 years. HIE papers, reports, and the definitive HIE summary *Free for All?* form the canonical basis for understanding healthcare demand and the response to insurance incentives, healthcare quality, and health outcomes in America.

Newhouse left the RAND Corporation and became a faculty member at Harvard University in 1988. As of 2007, he holds the ranks of John D. MacArthur Professor of Health Policy and Management (jointly in the Faculty of Arts and Sciences, Harvard Medical School, Harvard School of Public Health, and Kennedy School of Government); Director, Division of Health Policy Research and Education; and Director, Interfaculty Initiative on Health Policy. He created a doctoral program in health policy that exemplifies productive, collegial collaboration across the major schools at Harvard and that has trained more than 100 doctoral graduates now serving on university faculties, in public health agencies, and major health foundations.

Since 1966, Newhouse has authored or coauthored 350 publications (books, reports, and peer-reviewed journal articles). In 1981, Newhouse founded the *Journal of Health Economics*, an important economics journal. He continues to lead the editorial board, having edited more than 1,000 papers in the intervening years.

Newhouse has an extensive public service record. He has served as chair of the Prospective Payment Assessment Commission (ProPAC), commissioner of the Physician Payment Review Commission (PPRC), and vice chair of the Medicare Payment Advisory Commission (MedPAC). In 1977, he was elected to the national Institute of Medicine (IOM) and served two terms on the IOM governing council.

Newhouse has been the recipient of numerous awards, including the first David N. Kershaw

Award honoring persons under 40 years of age for distinguished contributions to public policy analysis and management (1983), the Baxter Health Services Research Prize and the Administrator's Citation from the U.S. Health Care Financing Administration (HCFA) (both in 1988), and the Distinguished Investigator Award from the professional association AcademyHealth (1992). He is a past president of the Association for Health Services Research (now AcademyHealth) and the International Health Economics Association, and he was the inaugural president of the American Society of Health Economics. He was elected fellow of the American Academy of Arts and Sciences (1995) and fellow of the American Association for the Advancement of Science (2002).

Kathleen N. Lohr

See also Health Economics; RAND Corporation; RAND Health Insurance Experiment (HIE)

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- Harvard University, John F. Kennedy School of Government: <http://www.ksg.harvard.edu>

NIGHTINGALE, FLORENCE

Florence Nightingale (1820–1910) was responsible for professionalizing nursing. She also was a sanitarian, a hospital administrator, and an early biostatistician. Born in Florence, Italy, in 1820, to a wealthy British couple, Nightingale grew up in England. She became well educated for a woman of those times. As a young woman, Nightingale had a calling from God asking her to do His work, though she did not discover His plan until years later. As a result of her interest in then current social issues, she began to visit the homes of the sick in villages near her home. While a woman of means would never become a nurse, on a tour in Europe, she visited a Prussian hospital and school

for deaconesses in 1846. She later returned to train as a nurse, subsequently becoming, in 1853, the unpaid superintendent of a London establishment for sick gentlewomen.

The Crimean War broke out in 1854; reports criticizing the British medical facilities for the wounded resulted in her appointment to officially introduce female nurses into the military hospitals in Turkey. Although the physicians did not initially welcome her and her nurses, the women's skills were quickly appreciated. Nightingale's actions improved both the sanitary and emotional status of the wounded soldiers. Under her administration, the mortality rate of patients in the hospital decreased significantly. Her rule that she should be the only nurse in the wards at night earned her the title of the "Lady With the Lamp." Nightingale performed statistical analyses of disease and mortality. She ultimately became the general superintendent of the Female Nursing Establishment of the Military Hospitals of the Army.

Nightingale returned from the Crimean War in August 1856, soon participating in the creation of the Royal Commission on the Health of the Army. She contributed information in the form of her *Notes on Matters Affecting the Health, Efficiency, and Hospital Administration of the British Army, Founded Chiefly on the Experience of the Late War. Presented by Request to the Secretary of State for War*.

Nightingale was committed to the use of statistics, which she employed to support her ideas on healthcare and public health. She worked with the British statistician William Farr. As a result of her statistical accomplishments, she became the first woman to be elected as a fellow of the Royal Statistical Society, in 1858.

Perhaps Nightingale's greatest achievement is her elevation of the status of nursing: It became a respectable profession for women. In 1860, she established a nursing school at London's St. Thomas' Hospital. Nurses, trained in her program, worked in staff hospitals throughout Britain and abroad, establishing nursing training schools using her model.

Nightingale was an advocate of the pavilion style of hospitals: completely detached pavilions, separating medical pathologies, to prevent the spread of diseases. Her *Notes on Nursing* was first published in 1860; its latest printing was in 1992.

She campaigned to improve health standards, writing extensively on the subject. Queen Victoria awarded her the Royal Red Cross in 1883. Nightingale became the first woman to receive the Order of Merit in 1907. She died at the age of 90 in 1910.

Rosemary Walker

See also Epidemiology; Farr, William; Health Services Research, Origins; Hospitals; Nurse Practitioners (NPs) Nurses; Public Health; Quality of Healthcare

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- Florence Nightingale Museum: <http://www.florence-nightingale.co.uk>

NONPROFIT HEALTHCARE ORGANIZATIONS

A nonprofit healthcare organization is legally structured as a not-for-profit corporation and is prohibited from distributing profits to its owners, members, or other individuals with oversight for the organization. Nonprofits have a charitable mission related to the provision of healthcare

services, teaching, research, and/or community service, and they are legally required to work towards the mission. These organizations are owned by their “community,” which may be a religiously affiliated or unaffiliated community or other nongovernmental association. Nonprofit hospitals are the dominant type of hospital ownership in the United States. Other types of healthcare organizations may also be organized as nonprofits, including long-term care facilities and health plans. Only a small percentage of the nation’s nursing homes are nonprofit, with the majority being proprietary or for-profit organizations.

Characteristics

Several characteristics conceptually differentiate nonprofit from other types of ownership, particularly for-profit healthcare organizations, including the primary stakeholders of these entities, the benefits of tax-exempt status, their sources of capital, and the provision of community benefits.

Ownership

A nonprofit healthcare organization is owned by its community, meaning that it is owned by a community or other nongovernmental association, such as a church or fraternal organization, and is governed by a voluntary, self-perpetuating board. Nonprofits may or may not be religiously affiliated. This is distinct from a for-profit healthcare organization, which is owned by its shareholders and governed by an elected board, and from a public hospital, which is owned by the federal, state, or local government and, in the case of federal and state-owned hospitals, principally serves selected populations (e.g., military) or, as in the case of local, government-owned hospitals, often serves the indigent. While for-profit organizations distribute their profits back to their shareholders, nonprofit organizations are prohibited from distributing profits to those who control the organization, although incentive-based compensation for organization leaders is common. Profits are implicitly reinvested into the organization’s community—through enhanced services, new plant and equipment, or other initiatives that provide a community benefit.

Tax-Exempt Status

As tax-exempt entities, nonprofit healthcare organizations are expected to provide community benefits, commonly achieved through charity care, education and training, research, and/or community service. Tax-exempt status means that the organization is exempt from paying federal, state, and local taxes, including income, sales, and property taxes. In addition to being exempt from taxes, a nonprofit organization may use tax-exempt bond financing, which lowers its cost of capital investments. Nonprofit organizations have the advantage of being exempt from paying income taxes on interest income generated from tax-exempt bonds. Nonprofits may accept charitable donations, and donors may deduct these charitable contributions. From the federal perspective, a healthcare organization qualifies under Section 501(c)(3) of the Internal Revenue Service (IRS) tax code in the United States. Nonprofit organizations must also meet state requirements for nonprofit entities to receive a state income tax exemption as well as local requirements for local sales and property tax exemptions. These requirements vary by state and are often more stringent than federal requirements.

Sources of Capital

Nonprofit healthcare organizations rely on several primary sources for capital. These include charitable contributions, which are tax deductible by the donor, debt, retained earnings, and government grants. Having a tax-exempt status provides nonprofits with the opportunity to use tax-exempt debt as one mechanism to finance capital investments. For-profit organizations use retained earnings and debt to fund capital investments, but they also use equity capital from investors and return-on-equity payments from third-party payers.

Community Benefit

Although the provision of community benefit is the linchpin of qualifying as a nonprofit healthcare organization, there is no unambiguous definition of what community benefit entails, how it should be measured, or what qualifies as a sufficient amount in terms of measuring whether a nonprofit

organization meets its community benefit obligations. Community benefit is generally considered to include services that are unprofitable but provide an important contribution to the community. Uncompensated care, Medicaid-covered services, and certain unprofitable service lines are considered to be community benefit. Uncompensated care is composed of charity care and bad debt. Charity care includes services that are provided but for which the provider does not expect a payment. Generally, the decision about whether services qualify as charity care is made prospectively or as early in the delivery of care as possible when a prospective decision is not feasible. The provider does not bill the patient or insurer, nor does the provider pursue collection of payment from an external source. Hospitals often use a sliding scale based on income to determine whether an individual is eligible for charity care and, if so, the amount of the discount. In addition, hospitals may use an asset test to determine eligibility. Bad debt, on the other hand, is care for which payment is expected to be collected by either the patient or the insurer but is ultimately not paid. Hospitals make an effort to collect these payments using internal and/or external collections processes. Some argue against the inclusion of bad debt as uncompensated care, because organizations make an active attempt to collect payment from the patient and/or insurer and, after a sufficient amount of time, elect to write off the uncollectible amount.

Medicaid-covered services are classified as a community benefit, because reimbursement from state Medicaid programs is often below the cost of providing the care. In addition, certain unprofitable services lines, such as the emergency department, high-level trauma, and labor and delivery, are considered as community benefits. Most nonprofit hospitals also provide additional community outreach programs, such as community health screenings, health education programs, immunizations, and community health assessments of unmet needs. Research that generates findings available to the community may also be included as a community benefit.

The valuation of community benefit is highly variable across organizations. No consistent guidelines exist for how to quantify or report the dollar value of these benefits. While nonprofit organizations may report a dollar amount of community

benefit, cross-institution comparisons would be questionable—reports of community benefit may, for example, value charity care based on the charges for care provided to these patients, even though charges reflect neither the organization's costs nor expected payments. Organizations may or may not include bad debt and losses from services provided to Medicare and Medicaid patients.

Comparison of For-Profit and Nonprofit Organizations

The fundamental structure of nonprofits suggests that these organizations should behave in a manner that differs from for-profit entities. The charitable mission—to provide a community benefit—of a nonprofit differs from that of a for-profit, whose implicit or explicit mission is to increase the wealth of its shareholders. The difference in missions suggests that nonprofit organizations should provide more services to the community in which they reside. In addition, because of the shareholder-driven mission, for-profits conceptually have a greater incentive to provide more and more profitable services than their nonprofit counterparts, which may mean providing fewer unprofitable services and serving fewer indigent patients.

From a practical perspective, whether for-profit and nonprofit healthcare organizations are intrinsically different has long been debated. Some argue that the economic incentives inherent in the distribution of profits to shareholders are vastly different from the incentives for organizations that do not answer to shareholders. Others maintain that the ultimate motivation of both types of organizations is similar—both strive to maximize earnings over expenses (i.e., accounting profits) and must meet the needs of the patient to remain profitable and, therefore, should be expected to behave similarly. In addition, the lines between nonprofits and for-profits have blurred, due to relationships between the two.

Importance of Profit

Regardless of the type of organization, both for-profits and nonprofits must earn a profit or surplus in the long run to remain financially viable. To achieve this goal, both types of organizations must respond to their community's needs and

provide high-quality care. While for-profits return a portion of their profits to shareholders, they must also make investments in their organizations to remain competitive. Likewise, nonprofits could not achieve their missions without earning profits for future investments to remain competitive.

Hybridization of Ownership Type

While some organizations are purely nonprofit or for profit, others may have elements of both within the same corporation. Examples include a nonprofit organization owning a for-profit subsidiary; a nonprofit organization contracting with a for-profit organization to provide specific services, as when a community hospital contracts with a for-profit anesthesiology group to provide anesthesiology coverage in the surgical suite; and joint ventures between nonprofit and for-profit organizations.

Efficiency

While some claim that for-profits provide less efficient care, in terms of either providing more services and more expensive care than needed or charging prices that are disproportionately higher than costs compared with nonprofits, others argue that for-profits are more efficient because of their underlying mission to generate a profit for shareholders. Systematic evidence comparing the quality of care among nonprofit and for-profit hospitals does not exist, however, to support these claims.

Quality of Care

It has been argued that for-profits provide lower quality of care than their non-profit counterparts. However, there is little consistent evidence to support this claim. While some studies have found higher quality of care in nonprofit hospitals, other studies have found no difference or higher quality in for-profits.

Uncompensated Care

Research has been mixed on whether nonprofit organizations provide more uncompensated care than their for-profit counterparts. Some studies have found that provision of uncompensated care is greater among nonprofits, while other studies

have found no significant difference. Studies of nonprofit to for-profit hospital conversions have suggested that those converting to for-profit entities do not change their level of uncompensated care provided to the community.

The Future of Nonprofit Healthcare

In recent years, nonprofit hospitals have been under increased scrutiny to explicitly quantify their benefit to the community. Two findings have led federal and state governments to investigate whether nonprofits are meeting their community benefit obligations. First, evidence has suggested that nonprofit and for-profit hospitals provide similar levels of uncompensated care, calling into question the marginal contributions that nonprofits make to the community, which are required to qualify for tax-exempt status, and whether their marginal contribution is equivalent to the tax benefits they receive from possessing tax-exempt status. Second, because insurers negotiate payment rates with hospitals that are lower than those charged by the hospitals, uninsured individuals have often been obligated to pay more for care than otherwise similar individuals with insurance. Coupled with this issue, there have been complaints about aggressive debt collection practices by nonprofit hospitals that contradict the organizations' charitable mission. Nonprofit hospitals' billing and collection processes have been questioned in light of these organizations' tax-exempt status.

States have implemented a variety of requirements for nonprofit hospitals, in particular to ensure that they are meeting their community benefit obligations. State-mandated methods of demonstrating community benefit include the requirement of a written charity care policy that is accessible to patients; mandating a minimum threshold for the value of community benefit as a percentage of net patient revenue or operating revenue; mandating that community benefit is at least equivalent to the value of the tax-exempt benefits received by the hospital; and routine documentation of the hospital's community benefit contributions. As hospital competition continues, nonprofit and for-profit hospitals will increasingly become less differentiated. The need for nonprofit hospitals to be price, quality, and outcomes competitive with for-profit hospitals will also continue. These

organizations will need to justify their benefits to the community while at the same time providing care that is both of high quality and efficient.

Tricia J. Johnson

See also Charity Care; For-Profit Versus Not-For-Profit Healthcare; Hospitals; Multihospital Healthcare Systems; Nursing Homes; Regulation; Uncompensated Healthcare; Uninsured Individuals

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- Internal Revenue Service (IRS): <http://www.irs.gov/publications/p557/ch03.html>
- National Association of Community Health Centers (NACHC): <http://www.nachc.com>

NURSE PRACTITIONERS (NPs)

Nurse practitioners (NPs) are nonphysician clinicians who are nurses with graduate degrees in advanced-practice nursing. The primary function of nurse practitioners is to promote wellness through patient health education. Their role has expanded to include the following: taking patients' comprehensive health histories, performing physical examinations, ordering laboratory tests and procedures, and formulating and managing care regimens for acutely and chronically ill patients. Nurse practitioners work in a variety of settings, including physician offices, clinics, hospitals, and nursing home facilities. In 2008, there were about 160,000 nurse practitioners in the United States.

History

The nurse practitioner movement began in the United States in the mid-1960s, with the preparation of pediatric nurse practitioners at the University of Colorado. Initially, the profession was developed in response to a shortage of physicians, especially in rural areas where healthcare access was limited. Over time, other states also began nurse practitioner training programs, and their role in healthcare greatly expanded. Today, nurse practitioners are integral to all kinds of practices, including those located in underserved, rural, and inner-city areas and in private collaborations, independent practices, hospitals, and continuing care and nursing home facilities. Additionally, other countries such as the United Kingdom, Canada, Australia, and New Zealand have embraced nurse practitioners.

Clinical Roles

The most significant clinical role of nurse practitioners relates to their professional efficacy and autonomy in practice. They can diagnose, treat, prescribe medications, order diagnostic testing, and refer patients to other healthcare professionals. Nurse practitioners monitor and adopt evidence-based practice and bring the framework of prevention, early intervention, and patient/family health education into their work. In the United States and other countries, nurse practitioners

have a specific license for practice. In the United States, most such licenses are granted and supervised by a state's board of nursing. This licensing distinguishes nurse practitioners from physicians' assistants, who typically practice under direct supervision of physicians and whose practices are authorized by a state's board of medicine.

While nurse practitioners can and often do work independently, most have collaborating physicians who review cases and provide ongoing consultation. The nursing board in a particular state may or may not require the existence of a relationship with a physician colleague. However, most advanced-practice nurses and physicians alike find the relationship stimulating and informative. The teamwork nature of such collaboration often is visible in primary-care practices or hospital specialty services, where physicians and nurse practitioners work in the same setting. Patient satisfaction and patient outcomes in these collaborative practices are similar to or better than in many traditional, physician-only practices.

Preparation

Nurse practitioners are prepared at the master's level or beyond. The educational programs are designed to make the graduate eligible for certification as a nurse practitioner in a specific area, such as care of families, children, or adults, in psychiatry, or in women's health. Certification is gained by completing the requisite educational program and passing an examination offered by specific certifying bodies. These entities are generally associated with a specific practice, such as midwifery. A significant educational requirement is actual practice under the close supervision of a licensed and certified nurse practitioner, with a minimum of 1 year of practice, or a physician. Four hundred or more hours of such practice are required. Some specialties require additional training, such as working with a minimum number of mothers in childbirth to qualify in midwifery.

Practice Standards

The American Academy of Nurse Practitioners (AANP) defines the standards of practice for nurse practitioners and updates or revises them periodically. The eight standards defining the

framework for nurse practitioners are as follows: (1) the process of care, including assessment of health status, diagnosis, development of a treatment plan, implementation of the plan, and follow-up evaluation of the patient; (2) care priorities, including patient and family education, provision of competent care, facilitation of entry into the healthcare system, and a safe environment; (3) interdisciplinary and collaborative responsibilities as a member of the healthcare team; (4) accurate documentation; (5) patient advocacy; (6) quality assurance and continued competence; (7) adjunct roles, including mentor, educator, researcher, manager, and consultant; and (8) research as a basis for practice. These standards reflect an origin in the general practice of nursing. Nurse practitioners do not replace nurses in practice settings. Rather, nurses and nurse practitioners provide a broadened skill mix from which to serve patients.

Doctorate in Nursing Practice

From the comprehensive nature of these standards, nursing educators realized that the depth and extent of preparation warranted redefining the earned education credential as a practice doctorate similar to that given in other professions, such as pharmacy, medicine, and dentistry.

The American Association of Colleges of Nursing (AACN) approved a policy statement saying that the doctor of nursing practice (DNP) degree be required for entry into nursing practice as an advanced practice nurse by 2015. With this policy statement, the AACN outlined the eight essential elements of doctoral education for advanced practice nurses. These elements include (1) the scientific underpinnings for practice, (2) organizational and systems leadership for quality improvement and systems thinking, (3) clinical scholarship and analytical methods for evidence-based practice, (4) information systems/technology and patient care technology for the improvement and transformation of healthcare, (5) healthcare policy for advocacy in healthcare, (6) interprofessional collaboration for improving patient and population health outcomes, (7) clinical prevention and population health for improving the nation's health, (8) and advanced nursing practice.

Disadvantages of the requirement of the DPN degree may include the increased costs to the students due to longer programs of study. There is a nationwide shortage of faculty in nursing schools. Initially, the costs of educating DNP degree students by doctorate of philosophy (PhD)-prepared faculty may prove challenging, but the growing numbers of DNP graduates will quickly offset this shortage. Finally, the costs to the nation's health-care system may be increased by DNPs who command higher salaries than current nurse practitioners. The additional preparation, however, should bring additional clinical leadership and skills to ensure that the latest scientific findings are readily translated into patient services.

Future Implications

While licensed independently, nurse practitioners only recently gained legal authority to bill separately from physicians. A provision in the federal Balanced Budget Act of 1997 states that nurse practitioners can receive direct Medicare Part B reimbursement, which is 85% of the physician rate. Prior to this legislation, nurse practitioners had to file under a physician's Medicare provider number. Some private insurance companies, however, did not follow the change in Medicare regulations and do not allow nurse practitioners to seek payment under their own provider number. Variations also exist among state Medicaid programs. California, for example, authorized nurse practitioners to bill its Medicaid program, Medi-Cal, directly, and be reimbursed at 100% of the physician reimbursement rate.

Many areas of the nation are expanding the role of nurse practitioners. As of 2006, all 50 states have awarded nurse practitioners prescription authority, with varying limitations. Many states also include controlled substances among the medications nurse practitioners can prescribe.

Because they possess independent licenses, nurse practitioners are viewed as challenges to health-care quality by some groups, most notably the American Medical Association (AMA). The AMA's concern is that nurse practitioners do not have the same preparation as physicians and should, therefore, be closely supervised. State legislatures, where efforts to shape nurse practitioner practices are revisited often, can reflect this tension. An area of

typical concern is the authority of nurse practitioners to prescribe medications. While all states have authorized them to write prescriptions, this authority was approved on a state-by-state basis. Florida also has restrictions on the number and types of nurse practitioner-managed offices that physicians may supervise, and other states may choose to follow this example.

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See also American Association of Colleges of Nursing (AACN); American Nurses Association (ANA); Hospitals; Medicare; National Institutes of Health (NIH); Nurses; Quality of Healthcare

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<http://www.aacn.nche.edu>
- American Nursing Association (ANA):
<http://www.nursingworld.org>

NURSES

Nurses are an integral part of the nation's health-care system, providing treatment and care to ill or

injured patients. There are currently more than 2.9 million nurses in the United States, which includes registered nurses (RNs), licensed practical nurses (LPNs), nurse practitioners (NPs), and others. While the definitions and theories about the field of nursing continue to grow and change, the role of the nurse remains vital for medical care.

History

The modern term *nurse* is derived from the Latin word *nutrire*, meaning to nourish or nurture. Florence Nightingale (1820–1910) is considered the founder of modern nursing. Recent analysis of Nightingale's letters to the Sisters of Mercy, who accompanied her to battlefields in the Crimea, reveal that she was greatly influenced by these religious women, who provided crucial skills in organizing and implementing care for the injured and wounded. On her return to England, Nightingale used this experience and knowledge to become a clear advocate for patient care, specifically the kind done by nurses. In 1859, Nightingale articulated the defining characteristic of nursing knowledge as “putting the constitution in such a state as it will have no disease,” or that it can recover from disease. She provided the profession significant public respect at a time when nurses were viewed as untrained and incompetent. After the Crimean War, around 1856, the public view of nursing evolved from the negative portrayal to that of an angel of mercy, largely due to Nightingale's influence.

The image of nursing continued to form and re-form. Today, nurses are largely viewed as careerists. During the 1920s, nurses were often viewed as women whose priorities were romance, marriage, and motherhood. By the end of World War II, however, nurses were seen as heroines and professionals. This portrayal soon reverted to a “sex object” image, where nurses were seen as women who were satisfying the needs of men and male physicians. The careerist image, however, began to compete with the “sex object” image throughout the mid-1960s and into the 1980s, when it finally became predominant.

Contemporary Definition of Nursing

Virginia Henderson (1897–1996), another pioneer in nursing, was dedicated to the scientific

knowledge that underpins the practice. Her view was bolstered by her singular focus to catalog relevant information from all disciplines. She and her colleagues accomplished this work long before computerized databases or nursing and allied health indexes existed. She defined nursing for practitioners worldwide as assisting individuals, sick or well, in the performance of those activities contributing to health or its recovery (or a peaceful death) that they would perform unaided if they had the necessary strength, will, or knowledge, and to do this in such a way as to help them gain independence as rapidly as possible. Henderson's definition embraces the concept that nurses meet patients wherever they are on a health, illness, and death continuum. It resonated with nurses worldwide, resulting in many translations of her work. Single-handedly, Henderson stimulated the international recognition of the common threads that join all nurses.

Struggle to Advance the Science of Nursing Practice

Continuing Henderson's work, early nursing scholars based their science on social, biological, and medical sciences. Yet they remained challenged to articulate what was specific to the practice of nursing. Beginning in the 1950s, the scholars in nursing began to develop and disseminate various nursing models. In particular, efforts were aimed at theory development so that nursing could develop specific evidence to guide its practice. Interestingly, most of the nursing research conducted into the mid-1980s focused on the individuals who were either nurses or nursing students, not on the nursing actions they performed. This approach changed dramatically after 1986, when the U.S. Congress created the National Center for Nursing Research within the National Institutes of Health (NIH). Nursing research then became part of the largest biomedical science entity in the nation. NIH funds support rigorous scientific efforts to promote the understanding of what happens to patients, without regard for the characteristics of the provider. Financial support of investigations of nursing workforce issues remained in other parts of the U.S. Department of Health and Human Services (HHS), such as the Agency for Healthcare Research and Quality

(AHRQ) and the Health Resources and Services Administration's Bureau of Health Professions (BHPPr).

Nursing Theories

The nursing conceptual models describe the interrelationship of concepts and the application of theory to identify, analyze, interpret, and evaluate client-based interventions and outcomes. Four concepts appear in most nursing theories or models: the person, the environment, the nurse, and health. These theories are generally classified as middle-range or practice theories. This remains a major descriptor of nursing theories today. A thorough review of nursing theories demonstrates the continuing impact of other health disciplines, with reliance on developmental scholars, such as Helen Erikson and Abraham Maslow, and the behavioral and socio-cultural sciences.

Dorothy Johnson's Behavioral System Model, established in 1959, focuses on common human needs, care and comfort, and stress and tension reduction. In 1964, Imogene King's Systems Framework, on the other hand, examined personal, interpersonal, and social systems. Myra Levine sought the need to move nursing away from the medical model and, in 1996, developed her Conservation Model, which focuses on adaptation as a means to preserve the integrity and wholeness of the person. Levine's work often is used in combination with standardized nursing nomenclatures, such as the Nursing Intervention Classification, to capture the practical benefits of this model. The Betty Neuman Systems Model, developed in 1972, also includes the concepts of adaptation, client holism, and stress in the client environment.

Dorthea Orem began developing her theory in the 1950s and formally presented her Self Care Model in 1970. The theory focused on nursing practice to move patients toward independence. That same year, Martha Rogers presented her theory of the Science of Unitary Human Being, which is not built on causality but is congruent with an action worldview. Another product of the 1970s was the Sister Callista Roy Adaptation Model, which concentrates on the adaptation processes of individuals, families, and groups.

Contemporary Nurses and Nursing

The contemporary nurse is a well-educated professional, either male or female. With more than 2.9 million nurses in the United States, RNs are the largest constituent of the nation's healthcare professions. Nursing distinguishes itself with a holistic focus on the patient and families and attention to actual or potential health problems. Nurses meet healthcare needs in virtually all settings, with more than half employed in hospitals, followed by community and public health centers, ambulatory care, nursing homes, and nursing education. Today's nurse uses assessment skills to diagnose a patient's response to illness and potential health conditions or needs and then develops an individualized plan of care. Nurses also collaborate with other healthcare professionals. A rich lexicon of nursing diagnoses and evidence supports professional nursing practice. The professional nurse continuously evaluates and modifies the patient's care plan and adjusts interventions to achieve the best possible outcomes.

Current Nursing Shortage

The United States currently faces a major crisis in nursing—the shortage of nurses presently and the increasing shortage predicted in the next 25 years. This shortage began in the late 1990s and is unlike previous shortages. Historically, classic principles of supply and demand mediated the crisis. Employers made economic and other enticements to make nursing a more desirable profession, and educational institutions increased enrollments to meet the demand. However, multiple factors make the current shortage different from those experienced in the past.

Not only is the nation's general population aging, but the nursing workforce itself is aging as well. Data from the 2004 National Sample Survey of Registered Nurses indicate that the population of nurses is aging quickly. For example, the average age of nurses in the nation is 46.8 years, with approximately 41% over 50 years of age. Only 8% are less than 30 years of age. It is anticipated that there will be more than 1 million RN vacancies by 2010. From 2000 through 2004, the average age of graduating nurses was 32.6 years, in

contrast to 27.8 years in 1984. In sum, the current nursing population is aging, and those who enter the field are older than before. Clearly, there is a pressing need to expand the pipeline of those entering the nursing profession, especially at a younger age. The potential for women to enter the historically male-dominated professions, such as medicine and other fields, has changed nursing demographics and presents a challenge to increasing the number of nurses.

Nursing school leaders indicate that a national faculty shortage is the major reason that more than 32,000 qualified applicants are not enrolled annually. Nursing faculty are on average 55 years of age or older, with 20% anticipating retirement in the next 10 years. Competition for clinical placement sites and space in general science laboratory courses compounds the difficulties faced by academic administrators as they attempt to expand enrollment.

Changes in the nation's healthcare delivery system have shifted most medical care from hospitals to outpatient settings. Those patients who are admitted to hospitals today experience illness intensities comparable with those in intensive-care units less than 50 years ago. Multiple societal factors, such as major changes to how Medicare calculates reimbursements to hospitals, converged to create new strategies for cost containment and control throughout healthcare, especially in hospitals. As nurses are the largest component of most hospitals' personnel expenditures, multiple approaches were undertaken to shift from an expensive, intensive RN workforce to less expensive and less well-educated personnel.

Nurses and other healthcare workers became alarmed at the diminishing quality of care associated with the decreasing numbers of nurses directing patient care. In some states, such as California, nurses successfully lobbied for state laws that specify the ratio of nurses to patients. Other advocates, such as the national Institute of Medicine (IOM), called for systematic and systemic efforts to manage patient care and decrease medical errors. Health services researchers have examined patient outcomes in relation to the preparation of the nursing staff. These studies documented better outcomes when patient care is directed by nurses with a baccalaureate or higher degree. Seminal work supported by the American

Academy of Nursing (AAN) aimed to identify the characteristics of hospitals associated with best practices, and strong patient outcomes were identified. Now, those hospitals can become designated as Magnet Hospitals, through the American Nurses Credentialing Center. The designation is awarded by examining both qualitative and quantitative evidence of meeting 65 standards that define the highest quality of nursing practice and patient care.

Another strategy to overcome the nation's shortage of nurses is to recruit and retain nurses who were educated in other countries. The number of foreign nurses in the United States totaled approximately 90,000 in 2004, and they were most common in California, Florida, New York, Texas, New Jersey, and Illinois. In some countries, such as the Philippines, there is a deliberate effort to prepare individuals to work in their native country as well as in the United States. In general, nurses are lured from poor nations by the promise of higher wages. However, such migration patterns can deplete nations of their own healthcare workforce.

Nursing Education

Early nursing education began as informal conferences and lecture-style training by physicians to nursing students in hospital-based programs. The nation's first formal nursing school was established in 1872 at the New England Hospital for Women and Children in Boston. Using Nightingale's model of nursing preparation, other schools were soon established, including the New York Training School at Bellevue Hospital, the Connecticut Training School for Nurses, and the Boston Training School for Nurses at Massachusetts General Hospital.

Hospital-based nursing training programs used the apprenticeship model in awarding the graduate a diploma. In the middle of the 20th century, there was a shift from the diploma program to college or university preparation, with the introduction of the 2-year associate degree. Many hospital-based nursing programs were shortened from 3 to 2 years to compete, but eventually most closed or merged into academic programs. In 2006, diploma programs made up only 4% of all the basic RN education programs in the nation.

In 1952, the associate degree in nursing was developed at Teacher's College, Columbia University in New York. To alleviate the nursing shortage of that time, this degree was designed to prepare technical nurses in 2 years. Typically, associate-degree nursing programs are offered at community or technical colleges. Graduates may take the RN licensure examination, because they are taught nursing theories and have gained practical and technical experience and skills. In 2005, associate-degree programs made up 58.9% of all U.S. basic nursing education programs. The increased demand for nurses is felt keenly at the community college level, where waiting lists for admission may have more than 1,000 individuals for 60 openings.

As the demand for further professionalism grew, many programs developed to offer a baccalaureate degree in nursing. The University of Minnesota School of Nursing opened in 1909 and is considered the first university-based nursing education program in the nation. The Yale University School of Nursing opened in 1924 and offered the first program contained within an autonomous academic unit. The baccalaureate degree with a major in nursing reflects the richness of the academy's curriculum with liberal arts and science courses designed to prepare individuals as critical thinkers, both in nursing and in life. Today, the degree is earned in 4 years. However, 5-year programs existed through most of the 1960s, as nursing faculty struggled to merge clinical content into educational models of academia. In 2005, there were 573 U.S. colleges and universities offering a baccalaureate degree in nursing.

Within the nursing profession, there has been lengthy debate to define the appropriate education level for entry into practice. The American Nurses Association (ANA) and the National League for Nursing (NLN) both support the baccalaureate degree to enter general practice as an RN. Others, such as the American Association of Colleges of Nursing (AACN), support entry into general practice at the master's level and into advanced practice at the doctoral level.

It is important to note that preparation for LPNs—called licensed vocational nurses (LVNs) in some states—occurs nationwide often in the last year of a high school program or the 1st year of an associate-degree program. There were approximately

710,000 LPNs in the nation in 2005. There is a separate licensing examination for LPNs and LVNs that is overseen by the National Council of State Boards of Nursing (NCSBN). Their scope of practice is regulated by State Boards of Nursing, which typically describe LPN practice as under the direction of the RN with great emphasis on physical care and related medical procedures.

The percentage of nurses who had earned a high school diploma decreased from 63.2% in 1980 to 25.2% in 2004. During that same period, nurses graduating with an associate's degree increased from 18.6% to 42.2%, and nurses entering the profession with a baccalaureate degree or higher increased from 17.4% to 31%. With the findings that better patient outcomes are associated with nurses with a baccalaureate or higher degree directing care, there is concern that the continuing large percentage of diploma and associate-degree nurses entering the field may be a disadvantage to patients.

Licensure

To practice as RNs, all graduates must prove their competency by passing a national examination. The examination is administered by the NCSBN and called the National Council Licensure Examination for Registered Nurses (NCLEX-RN). Successful completion of the examination is necessary for licensure in all states. Individual state laws and regulations govern the practice of nursing in each state. State differences concern topics such as the requirements for continuing education, the delegation of authority to other providers, and the scope of advanced practice. A compact now exists among several states so that participating states automatically recognize and accept the nursing license of individuals from another compact state. Most states, however, accept only the test results and require an application for practice within its boundaries. With nurses increasingly using telecommunications to address patient issues across state lines, the demand for more compact state agreements will likely grow.

Future Implications

Nursing is a dynamic profession that remains focused on patient outcomes, including peaceful

death. Nursing scholars continuously develop the evidence necessary to refine the practice, while healthcare leaders support and recognize the importance of nursing to the totality of healthcare in the United States.

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See also American Association of Colleges of Nursing (AACN); American Nurses Association (ANA); Hospitals; National Institutes of Health (NIH); Nightingale, Florence; Nurse Practitioners (NPs); Quality of Healthcare

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NURSING HOME QUALITY

Life in all its richness occurs in nursing homes. Sickness, love, caring, kindness, anger, abuse, indifference, excitement, boredom, laughter, sex, and death all transpire in nursing homes. Time-study data indicate that the average nursing home resident receives less than 1½ hours of care each day from nursing staff, indicating that treatment is a relatively small proportion of what fills the everyday life of nursing home residents. Thus, although excellent care and treatment are important, quality of care is only one aspect of quality in the nursing home. Because nursing homes are where people live, as well as receive health and rehabilitative care, discussions of nursing home quality become at the most global level deliberations about how to measure and ensure residents' well-being, in the fullest sense of the term.

While nursing homes serve a variety of populations, quality of care for long-stay residents is the focus here. This entry first provides basic information on nursing homes and their occupants. Next, it discusses how quality of care is usually measured in nursing homes. It then discusses the larger issue of quality of life. Last, it discusses the current quality assurance process in nursing homes and the future of nursing home care.

Nursing Homes and Nursing Home Residents

This discussion of nursing home quality necessarily occurs within the context of the current nursing home industry and resident population. On any given day, approximately 16,000 nursing homes in the United States provide care for roughly 1.6 million residents. Most nursing homes are for-profit, investor-owned enterprises operated by multifacility chains. The average size of nursing homes is approximately 100 beds, with an occupancy level below 90%. Over two thirds of longer-stay nursing home residents receive their care under the auspices of state Medicaid programs. Recent data indicate that state Medicaid programs pay on average about \$120 per day (over \$40,000 annually) for care. Private-pay residents now pay an average of about \$190 per day (almost \$70,000 annually). The federal Medicare program pays the bulk of costs for shorter-stay residents.

Almost all nursing homes accept Medicaid and/or Medicare funds. Receipt of these public funds requires that a nursing home be licensed by the state and certified to participate in and receive payment from these programs. Licensure and certification carry with them an elaborate array of requirements about financial reporting and resident care. The most basic of these requirements involve annual cost reports and annual on-site surveys by multimember teams who evaluate the degree to which a nursing home meets state licensure and federal certification standards.

Most admissions to nursing homes (just over 50%) come from hospitals. A large number of individuals, over the course of a year, come into nursing homes and then either die or leave within weeks. These short-stay individuals who return home are largely in the nursing home to recover from some acute disease episode such as the flu or to recover from an acute exacerbation of a chronic disease condition such as diabetes or from physical, speech, or occupational rehabilitation after a fall or stroke. On any given day, these short-stay residents constitute about 10% of a nursing home's population, but they constitute over 60% of all individuals admitted annually to nursing homes. Only about one quarter to one third of those admitted to a nursing home will be in the same nursing home 3 months after admission.

Only about 10% of long-stay nursing home residents are under 65 years of age. The average long-stay nursing home resident is a female over 75 years of age. Generally, she suffers from multiple chronic diseases and has a number of health problems, which are likely to include arthritis, hypertension, heart disease, and diabetes as well as decreased ability to see and hear. Like the majority of the residents surrounding her, she has episodes of urinary incontinence and some level of cognitive impairment. She also needs significant physical assistance with a number of activities of daily living (ADLs).

Quality of Care

Like other health services researchers, investigators conceptualize nursing home quality in terms of Avedis Donabedian's triad of structure, process, and outcome, with most researchers considering outcomes the most telling indicator of

quality of care. In nursing home research, the structural quality measure with the greatest impact on process and outcome quality is nurse staffing. Turnover of direct-care staff, nursing supervisors, and administrators are also structural measures that gather considerable attention as instances where quality of care is put at risk. Some evidence indicates that for-profit ownership also tends to be associated with poorer-quality care, but part of that relationship may be attributed to the generally lower staffing levels and higher staff turnover at for-profit homes. Process quality measures that receive the most attention are the presence of urinary incontinence without a scheduled toileting plan, the use of physical restraints, psychotropic medication use, the prevalence of feeding tubes, or the use of urinary catheters.

Outcome measures of importance for measuring nursing home quality include mortality, declines in functional status or activities of daily living (e.g., ADLs), worsening cognitive status, worsening conditions (e.g., continence), accidents, falls, or hospitalizations for ambulatory-care-sensitive conditions (e.g., diabetes). Unfortunately, little research finds strong links between these outcomes and the various process quality measures noted above. For both short- and long-stay residents recovering from an acute disease episode, significant improvement is a common outcome. However, that is not the case for the average long-stay nursing home resident.

Analyses of nursing home quality are almost invariably observational studies. To enhance their validity, observational studies involving process quality or outcome quality measures usually require some type of case-mix or acuity adjustment. A major difficulty arises in studies of nursing home quality focused on outcomes. In these studies, it is difficult to determine the degree to which any undesirable outcome resulted from poor nursing home performance rather than from the natural processes of declining health beyond the nursing home's control. For example, a resident's decline in ADL function does not mean with certainty that poor care occurred. Instead, unavoidable decline in one of the resident's chronic disease or health conditions (e.g., congestive heart failure) may have adversely affected his or her ADL function. For only a few outcome quality measures is poor quality of care a truly necessary condition (e.g., medication errors).

Those researchers involved in the necessary risk adjustment process in nursing home outcome studies have two options. Either they can include variables in their models that may overadjust, giving some nursing homes undeserved credit for bad-quality care, or they can omit some variables from their models, possibly underadjusting and failing to give some nursing homes credit for good-quality care. For example, when looking at pressure ulcer rates in a nursing home, should one adjust for residents being bedfast? Being bedfast clearly raises the likelihood of a pressure ulcer. But why is a resident bedfast? The resident may be bedfast because of some natural process of declining health, such as increased respiratory distress, or he or she may be bedfast because the nursing home failed to provide an aggressive mobility program that would have kept the resident mobile. Thus, including whether a resident is bedfast in an acuity adjustment model for the presence of pressure ulcers may be overadjusting, but omitting it from the model may mean underadjusting.

Researchers can avoid confounding the impact of individual factors and nursing home performance by looking at changes over time in resident status, using only admission information as baseline data. For almost all residents, provider performance and resident characteristics are orthogonal at admission. However, using this approach, researchers must show that the early months of care that serve as the focus of most such efforts do not differ dramatically from outcomes later in a resident's nursing home stay.

Quality of Life

Quality-of-life issues for nursing homes and their residents can incorporate a long list of dimensions. These include, but are not limited to, helping preserve residents' dignity, respecting their privacy, maintaining positive relationships with staff or other residents, serving high-quality food, enhancing opportunities for resident autonomy, assuring their security, and providing a clean and pleasant physical environment.

Quality-of-life data can be gathered in two ways. Researchers can observe some of these dimensions, such as staff-resident interactions, using standardized tools. Residents can also report on their perceptions concerning all these dimensions.

Each of these approaches, however, is troublesome. Observers cannot assess all aspects of quality of life. More fundamentally, observers (even family members) are not the true recipients of care and may not share residents' perceptions of services or living arrangements. Residents are, of course, the ideal reporters. However, a large proportion of residents suffer from levels of cognitive impairment that make interviewing them difficult or impossible.

The most extensive effort aimed at developing an interviewing strategy for quality of life resulted in 10 dimensions. However, the measurement scales reflecting only a few of these dimensions demonstrated good internal consistency. Additionally, facility characteristics explained very little of the variance in quality of life. Reasonably, residents' characteristics were much stronger predictors of their quality-of-life scores. Such measures, as the developers indicate, are at this point probably best used to identify cognitively intact residents within the nursing home who might be the focus of individualized interventions. While these measures are not yet well-suited for assessing nursing homes' performance in general, they are important steps in the process of moving quality of life into the mainstream of nursing home quality measurement.

Quality Assurance

As the national Institute of Medicine (IOM), Committee on Nursing Home Regulation met over 20 years ago, the committee chair Sidney Katz described quality assurance in nursing homes as a three-legged stool requiring good assessments, good standards, and good enforcement. The IOM report from this committee provided a blueprint for a new approach to ensuring quality in nursing home care. The Nursing Home Reform Act in the Omnibus Budget Reconciliation Act of 1987 (OBRA-87) was a direct descendant of the IOM committee's report. OBRA-87 mandated a comprehensive assessment system titled the Resident Assessment Instrument or Minimum Data Set (MDS), which served as the first leg of Katz's stool. New standards in OBRA-87 that included quality-of-life issues and focused more heavily on outcomes than paper compliance formed the second leg. Then, new enforcement remedies, which included fines, temporary management, and placing a hold

on Medicaid admissions to a nursing home, were added to the traditional remedies of deficiency statements from the annual certification and licensure survey conducted by the states and de-certification of the nursing home, to give the stool a truly solid base. The MDS was implemented in 1989. However, the enforcement standards and remedies were held up for many years by the nursing home industry. When finally implemented, they were watered down, and the expanded range of remedies has not been used vigorously by most states.

Current activities in quality assurance in nursing homes have begun to focus more heavily on quality indicators reporting and public information. The Centers for Medicare and Medicaid Services' (CMS) Nursing Home Compare (NH Compare) Web site allows individuals to obtain detailed information about the past performance of every Medicare- and Medicaid-certified nursing home in the nation. The reports in NH Compare include data on deficiencies cited during the annual (9–15 months apart) survey visits, quality indicators (QIs) from the MDS, and staffing data gathered during the annual survey visits. While MDS data may reflect what is in the medical records, recent research indicates that the staffing data reported to CMS by for-profit and larger nursing homes, when compared with Medicaid cost report data, may overreport staffing levels. A number of state-level reporting systems are somewhat more elaborate than NH Compare. Some state systems provide relative rankings of nursing homes (e.g., one through four stars) and include data on financial performance and expenditure patterns as well as more traditional and staffing data. Initial research findings indicate that such reports may affect nursing home activities, but there is no convincing evidence that such reports affect consumer choices.

In addition, a few researchers are now emphasizing the degree to which nursing home performance affects traditional quality indicators. Early research indicates that a relatively small percentage of the variation in ADL function over time may be attributable to nursing home performance. To the degree that this conclusion is supported by further research into other quality indicators, the quality-reporting movement in the nursing home sector may be at some risk. These reporting systems implicitly assume that nursing home performance explains a meaningful proportion of the variance in

each published indicator. That this assumption is rarely tested is, at this point, a problematic aspect of nursing home performance measurement.

Future Implications

The past few years have been marked by the nursing home industry's emphasis on quality improvement rather than quality assurance, the seeming failure of the current enforcement model, and the lack of serious enforcement activities. At the same time, a group of innovators have begun to offer alternative models of nursing home operations that focus directly on resident-centered care and enhanced quality of life. The Eden Alternative, the Pioneer Network, the Wellspring Initiative, and the Green House Movement are important examples of such alternative models of nursing home operations. All these models focus on more resident-centered care that emphasizes quality-of-life issues and better working conditions for nursing home staff. The Green House Movement takes a lesson from the group home model in community mental health and goes so far as to deconstruct the average 100-bed nursing home into a series of cottages with permanently assigned nurse aides and "circuit-riding" clinical staff.

Where these innovations have successfully been implemented and sustained, they have resulted in changes in the quality of life for residents. However, most nursing homes lack the willingness or ability to implement and sustain such innovations. With an industry dominated by for-profit, owned business entities and with high average turnover rates for senior administrative and clinical staff (ranging from 6 to 18 months), the likelihood of sustained, pervasive change in the nursing home industry seems relatively low. Some nursing homes, often not-for-profits in the least need of transformation, may change and sustain those innovations. Many nursing homes will likely focus on avoiding bad survey results and lawsuits, while maintaining the level of quality that allows them to receive an appropriate return on their investments.

A panel of distinguished experts in long-term care were recently asked what they thought would be the "one thing" that might have the greatest likelihood of enhancing quality in long-term care. The most frequent answer was additional staffing, followed closely by additional funding. But

some of the less frequent answers were interesting as well. One expert said that the real problem lies in the dominance of investor-owned businesses in the nursing home industry. Another expert suggested that the greater involvement of communities in nursing homes would bring considerable benefit.

Some policy analysts, however, consider nursing quality to be something of a vestigial issue. They believe that the current “rebalancing” of long-term care reimbursement to provide more incentives for home care, combined with the growth of the assisted living industry, will sound the death knell for the nursing home industry. However, many doubt that either home care or assisted living can be the panacea that these analysts believe. They argue that home care cannot be effective without adequate staff and considerable family support; and the availability of individuals to provide either paid or informal support, both of which are largely provided by females 40 to 60 years of age, will not be increasing at the rate of increase in the number of impaired elderly 75 years old or older.

Nursing homes most likely will not be vanishing soon from the long-term care tableau. They may change in relatively unforeseen ways as the populations whom they serve change. They may, as they have in the past, go through cycles of popularity with investors on Wall Street. Much about the future of long-term care in the nation is unclear, and much about long-term care may change as policymakers begin to address the aging of society. But nursing homes and the quality of care they provide will likely not disappear from the public policy agenda.

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See also Activities of Daily Living (ADL); Centers for Medicare and Medicaid Services (CMS); Donabedian, Avedis; Katz, Sidney; Long-Term Care; Nursing Homes; Public Policy; Structure-Process-Outcome Quality Measures

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American Health Care Association (AHCA): <http://www.ahcancal.org>

Association of Health Facility Survey Agencies (AHFSA): <http://www.ahfsa.org>

Centers for Medicare and Medicaid Services (CMS), Nursing Home Compare: <http://www.medicare.gov>

Eden Alternative: <http://www.edenalt.org>

Green House Project: <http://www.ncbcapitalimpact.org/thegreenhouse>

The National Citizens' Coalition for Nursing Home Reform, Consumer Voice for Quality Long-Term Care: <http://www.nccnhr.org>

Pioneer Network: <http://www.pioneernetwork.net>

Wellspring Initiative: <http://www.wellspringis.org>

NURSING HOMES

Nursing homes are licensed residential facilities with professional staff that provide continuous nursing care and health-related services for individuals who do not require hospitalization but cannot be cared for at home. These facilities provide 24-hour care for adults 18 years of age or older who are not in the acute phase of illness but who have significant functional deficiencies. Functional deficiencies are generally measured by individuals' ability to perform basic activities of daily living (ADLs), such as the ability to independently dress, eat, bathe, get around, and use the toilet themselves. Individuals may need nursing

home care for a short period of time, such as for rehabilitation or recovery after an injury or illness. Other individuals may require long-term or permanent care for chronic or progressive physical or mental illness or infirmity.

Types

Nursing homes provide different levels of care designed to meet the wide range of needs of individuals. They may specialize in short-term or acute nursing care, intermediate care, or long-term, custodial nursing care. Many of the nation's nursing homes provide more than one level of care.

Skilled-Nursing Facilities

Skilled-nursing facilities (SNFs) provide relatively short-term nursing and rehabilitative care. Skilled care is generally provided to assist patients during recovery following hospitalization for acute medical conditions. These facilities are state-licensed, and registered nurses (RNs), licensed practical nurses (LPNs), and certified nurse aids (CNAs) provide care. The services of other health-care professionals such as therapists, social workers, and dietitians are also available. Hospitals often have arrangements with skilled-nursing facilities to provide follow-up care for patients who no longer need acute hospital services. Skilled-nursing facilities provide skilled care and rehabilitation until the patient is able to return home or requires longer-term placement.

Intermediate-Care Facilities

Intermediate-care facilities provide care for individuals who are recovering from acute medical conditions but do not need continuous care or daily therapeutic services. Intermediate care is provided by skilled professionals such as RNs, LPNs, therapists, and other health professionals under the supervision of a physician.

Custodial-Care Facilities

Custodial-care facilities provide assistance to patients in activities of daily living, such as bathing, dressing, eating, and toileting. Individuals who are recovering from a disabling injury or illness

may temporarily need custodial care. For other individuals who are losing their ability to function independently due to chronic or progressive disease or frailty due to advanced age, custodial care may be a long-term need. For some, ongoing professional nursing and other services may be required along with custodial care. If custodial-care residents become ill or injured, they may spend a period of time in skilled care and then return to custodial care.

Many nursing homes also provide specialized services such as hospice and respite care. Hospice care offers supportive services for terminally ill patients and their families. Nursing homes may also provide respite care for individuals who are being cared for at home to allow a family caregiver relief for short periods of time. Some nursing homes have specially equipped units for persons who are ventilator-dependent, have Alzheimer's disease, or have spinal cord injuries.

Services Provided

Nursing homes provide a wide range of services, including medical-care services; nursing-care services; other professional healthcare services; personal-care services; spiritual, social, and recreational services; and residential-care services.

Medical-Care Services

Regardless of the level of care required, all nursing home residents are under the supervision and care of a physician. Physicians certify the continuing need for nursing home care and are responsible for the resident's overall care plan. Physicians also evaluate and prescribe for the resident's medical conditions and determine the types of restorative and rehabilitative services that are required. All nursing homes must have a medical director who can address medical issues and other concerns with the resident, the resident's family, and the attending physician.

Nursing-Care Services

In the United States, all nursing homes are required to have a licensed practical or vocational nurse (LPN/LVN) on duty 24 hours a day and an RN on duty for at least one shift each day. Nursing

services include the regular assessment of residents' needs, administration of medications and treatments, and coordination of care.

Other Professional Healthcare Services

Nursing homes provide rehabilitative and restorative services such as physical, occupational, respiratory, recreational, and speech therapy. In addition, dental services, dietary consultation, laboratory, X-ray, and pharmaceutical services are available.

Personal-Care Services

Nursing assistants also provide personal-care and supportive services for residents who require help with activities of daily living, such as eating, bathing, walking, and toileting.

Spiritual, Social, and Recreational Services

Nursing homes offer a wide range of services and programs to meet the spiritual and social needs of residents. Clergy and social workers are also available to support family members and friends. Most nursing homes also offer a wide variety of in-house recreational activities and organized trips.

Residential-Care Services

Nursing homes provide general supervision within a safe and secure environment along with basic housing and sustenance.

Eligibility

Each state has its own nursing home eligibility criteria. A prescreening assessment is completed for every individual being considered for nursing home admission. The assessment includes the evaluation of an individual's physical and cognitive limitations, medical conditions, the type and level of assistance required, and skilled-care needs. Although there is some variation across states, the requirements are very similar overall. For skilled-nursing facilities, a state's requirements include a need for at least one skilled service ordered by a physician, such as the administration of medications, special

catheter care, rehabilitation, or nasogastric tube for gastrostomy feedings.

Paying for Nursing Home Care

Many Americans incorrectly assume that the federal Medicare program or standard or supplemental health insurance policies will pay for nursing home care. Consequently, many people do not plan ahead financially or purchase long-term care insurance to provide for their care in the event of infirmity or an extended illness. Nationally the costs of nursing home care often exceed \$50,000 annually, or more than \$4,000 a month.

Medicare

The federal Medicare program is available to those nursing home residents who are eligible for the program, either through age or disability, and who require a skilled level of nursing home care. Generally, Medicare covers services after hospitalization. The number of days that Medicare will pay for skilled-nursing facility care is limited to no more than 100 days per episode of care. During the first 20 days of care, Medicare pays 100% of care. Between 21 and 100 days, Medicare requires a copayment. Many older persons have a Medicare supplement or Medigap insurance policy. This supplemental insurance pays in conjunction with Medicare, but most supplements stop paying when Medicare reimbursement ends. Medigap insurance policies are sold by private insurance companies. To buy a Medigap insurance policy, the individual must already have Medicare Part A and B insurance. Finally, each individual must buy separate Medigap insurance policies, as coverage will not be provided under a spouse or family member's insurance policy. Neither Medicare nor Medigap insurance policies will pay for custodial nursing home care.

Medicaid

If persons have exhausted their Medicare payments for nursing home care, or if they do not require skilled care, they may qualify for Medicaid coverage to pay for their nursing home care. However, Medicaid is only available to persons who have low incomes or limited resources. To

qualify for Medicaid, individuals may have to spend out-of-pocket for care until their income drops to the level required for Medicaid eligibility. States vary in how they consider an individual's assets, such as the spousal home, when determining eligibility for Medicaid. Persons who stay in nursing homes for an extended period, often until death, are typically supported by Medicaid.

Long-Term Care Insurance

A relatively small number of individuals choose to purchase long-term care insurance in the event that they may need long-term care in the future. This insurance must be purchased prior to needing long-term care, and eligibility for this type of insurance is based on health status at the time of purchase. Some financial planners recommend purchasing long-term care insurance when a person is in his or her late 50s or early 60s. Premiums are based on age, health status, and type of plan purchased.

Individuals often consider three things when deciding which long-term care insurance to purchase: the daily benefit, the benefit period, and the elimination or deductible period. The daily benefit is the amount of money that the individual will receive from the insurance company for care on a daily basis. The benefit period is the length of time that benefits will be provided (options generally include 1, 2, or 3 or more years of coverage, or a lifetime plan). And the elimination or deductible period is the number of days the individual is responsible for paying for long-term care before the insurance begins to pay for the care.

Licensing and Certification

State governments are responsible for overseeing the licensing of nursing homes. Each state is contracted by the U.S. Department of Health and Human Services' Centers for Medicare and Medicaid Services (CMS) to monitor its nursing homes. Facilities that want to provide care and be reimbursed by Medicare and Medicaid must adhere to at least minimum state quality requirements. States conduct onsite inspections to determine whether a facility meets quality and performance standards. Inspections are typically yearly, but can occur more frequently, especially if

concerns are voiced or if complaints are made about the care provided. The inspection process includes observations of care processes, staff/resident interactions, and the physical environment. The inspection team also interviews a sample of nursing home residents and family members about the care in the home. Care providers and administrators are interviewed, and clinical records are reviewed based on standardized protocols. The inspection team, which includes an RN, also examines food preparation and storage, fire safety, safe construction standards, and issues related to possible resident abuse. If problems are identified, the CMS can take action against the facility. This can range from imposing a fine, to denying payment, to assigning a temporary manager or installing a state monitor. If the problems are not corrected, the CMS can terminate its agreement with the nursing home. At that point, the nursing home is no longer certified to provide care to Medicare beneficiaries and Medicaid recipients, and these residents will be transferred to other facilities. With the loss of those residents, the nursing home is very likely to close.

Selecting a Nursing Home

Although the individual requiring nursing home care should be involved as much as possible, selecting a nursing home often becomes the responsibility of a family member or friend. Fortunately, there are many resources available to assist in making the decision.

A number of steps in choosing a nursing home have been identified. Generally, the first step in choosing a nursing home is to discuss with a physician the specific types of services that are required and the level of care that is needed. Alternatives to nursing home care should also be discussed at this time. Home care services or adult day care should be considered as a possible alternative, and financial arrangements must also be taken into account.

Once it is determined that nursing home care is required, the next step is to identify local nursing homes that provide the types of services that are needed. There are a number of resources that can provide information. These include state long-term care ombudsman programs, health departments, hospital discharge planners, social workers, geriatric case managers, state or local departments of

aging, the Medicare Web site and informational materials, and Web sites of individual facilities. Friends, neighbors, and clergy may also offer recommendations.

When the list has been narrowed to those local facilities that provide the needed services, family members and future residents will want to evaluate services and amenities. They should talk with administrative personnel at each facility to arrange for a tour. They should plan to visit each facility two or three times at different times of the day and arrange visits to observe meals and recreational activities. Personal observations and interactions with staff will provide the most valuable information about the quality of care provided by the nursing home.

For example, family members and individuals will need to determine if the nursing home is in a quiet, safe area that is accessible, as continued contact with family and friends is a vital aspect of a resident's well-being. They will also need to note if the building is in good repair, has adequate space, and appears clean and safe. Potential residents and families will also want to pay attention to social interactions within the facility and the availability of group activities. Residents should all have the opportunity to take part in activities that provide mental, physical, and social stimulation and decrease the likelihood of isolation. Monthly programs and activities should be posted at each nursing home.

During these initial visits and tours, families and individuals should talk to all levels of staff, including the director and nursing assistants; they should observe the staff interactions with the residents, meal presentation and preparation, and resident interactions in the dining room and other common spaces. Potential residents and family members should talk directly to the other residents, inquiring about their experience in the facility and their daily activities. Finally, they should be aware of any special services the nursing home offers to residents, such as religious services, particular diet preferences, or field trips.

It is also important to evaluate quality when selecting a nursing home. Every nursing home facility is inspected annually by its state health department. The survey results are available at the facility and the public may review the report of the facility's performance using Medicare's "Nursing

Home Compare" Web site. Survey results address all aspects of care provided by the nursing home, from what might be considered minor infractions to major issues of concern. A staff representative can answer questions and provide additional information about the report and about whether identified problems have been corrected.

Often the potential nursing home resident is unable to be involved in every step of the selection process; it is essential, however, to the degree that it is possible, that he or she be involved in the final choice. Many people are reluctant to enter a nursing home, even if it is necessary. Of the options available, the facility chosen must be a place where the individual believes that he or she will be most comfortable.

Ombudsmen

In 1978, the U.S. Congress amended the Older Americans Act to include a requirement that each state develop a long-term care ombudsman program. Provisions of the act require that each state institute a program that defines the function and responsibilities of ombudsmen, addresses complaints, and advocates for improvements in the long-term care system.

The ombudsman program is administered by the federal Administration on Aging, and most state ombudsman programs are housed in their state unit on aging. There are 53 state long-term care ombudsman programs and about 600 regional programs in the nation. Over 8,400 volunteers have been certified to handle complaints. Nationally, the ombudsman program handles over 264,000 complaints annually. An individual 18 years of age or older who has the time and interest may volunteer to become an ombudsman. Although specific requirements vary from state to state, generally ombudsmen may not have a family member who is a resident in a local nursing facility, and they must not be employed by or have ownership in a long-term care facility. Volunteers must provide references, and criminal background checks are required. Once accepted into the program, ombudsman volunteers receive training and are certified.

Long-term care ombudsmen serve as advocates for nursing home residents. The ombudsmen provide a wide range of services for nursing home

residents and their families, from advising in the selection of an appropriate nursing home to resolving complaints made by or for residents. They may also address a wide range of quality of care and quality-of-life concerns that can include unanswered call buttons, roommate problems, staffing issues, food concerns, and unsanitary conditions. They often visit nursing homes to reach out to residents and families, as well as receiving complaints by telephone, mail, and e-mail.

Ombudsmen conduct educational sessions for nursing home staff, family, resident councils, and others. Programs include residents' rights, restraint reduction, abuse and neglect regulations, and how to deal with difficult behaviors. They also provide general information to the public on nursing homes and other long-term care facilities and services, residents' rights, and legislative and policy issues. Nursing homes are required to clearly post information about the ombudsmen program and how residents or other concerned individuals may contact an ombudsman.

Cultural Change Movement

The cultural change movement is a grassroots effort to transform the culture of aging. This effort, led by a group called the Pioneer Network, grew out of a small group of providers and researchers who were interested in changing the culture of nursing home care into places for living and growing rather than decline and death. This group has identified 13 core values for improving the quality of long-term care in persons' homes, assisted living, nursing home, and other facilities. The Pioneer Network also acts as a liaison between long-term care researchers and nursing homes to encourage nursing homes to participate in research and to help researchers and providers to translate findings into practice.

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See also Centers for Medicare and Medicaid Services (CMS); Continuum of Care; Long-Term Care; Long-Term Care Costs in the United States; Medicaid; National Citizens' Coalition for Nursing Home Reform (NCCNHR); Nursing Home Quality; Skilled-Nursing Facilities

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Web Sites

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- American Association of Homes and Services for the Aging (AAHSA): <http://www.aahsa.org>
- American Health Care Association (AHCA): <http://www.ahcancal.org>
- National Center for Health Statistics (NCHS): <http://www.cdc.gov/nchs>
- National Council on Aging (NCOA): <http://www.ncoa.org>
- Nursing Home Compare: <http://www.medicare.gov/nhcompare>



OBESITY

Obesity is a major public health problem in the United States; it has a significant impact on access, cost, and quality of healthcare. The prevalence of obesity has increased over the past 30 years to the point where many refer to it as an obesity epidemic. Today, more than 65% of adults in the nation are either overweight or obese. Additionally, 33.6% of children between 2 and 19 years of age are at risk of being overweight or are overweight. Obesity is currently the second leading cause of preventable deaths in the nation, and it may surpass smoking as the leading cause of preventable death in the future.

The link between lifestyle and obesity starts in the prenatal period. Children are exposed to parental behaviors, which they may model later in life. School lunch programs aim to meet nutritious guidelines but often do so with limited resources. An emphasis on academic standards frequently reduces time for free play and activity in school, either during recess or gym class. Computers, television, and video games are widely available to children, who often prefer these activities to physical activity after school and on weekends. Adults are bombarded with fast-food establishments, convenience foods, and demanding time constraints, which may lead to poor food selection and inactivity. Taken together, the typical American family has significant barriers to making healthy food choices and participating in physical activities.

Assessment of Risk

An important measure of weight and obesity is the body mass index, or BMI. The BMI is used to assess a person's risk of weight-related comorbidities based on his or her relative weight to height. The formula for calculating the BMI is $BMI = \text{weight (kilograms)} / [\text{height (meters)}]^2$. The nonmetric conversion formula is $BMI = \text{weight (pounds)} / [\text{height (inches)}]^2 \times 703$. For example, a person who weighs 175 pounds and is 66 inches tall (or 5 foot 6 inches) has a BMI of 28: $\text{weight (175 pounds)} / [\text{height (66 inches)}]^2 \times 703 = 28$.

A healthy BMI for adults is between 18.5 and 24.9. A BMI less than 18.5 is considered underweight and may be associated with decreased immune function, osteoporosis, decreased muscle strength, and trouble regulating body temperature. At BMIs greater than 25, a person's risk of weight-related illness or comorbidities increases. Between 25.0 and 29.9 adults are classified as overweight, and people with a BMI of 30.0 or higher are considered obese.

In children, the BMI is stratified by age and gender. This is done to control for the changes in body fat that are expected as children grow. It also allows for the differences in body fat between boys and girls. BMI-for-age tables are available from the Centers for Disease Control and Prevention (CDC) and are used to help healthcare practitioners assess adiposity (fatness) in children. A BMI-for-age that is less than the 5th percentile is considered underweight. Healthy weights include

BMI-for-age from the 5th percentile to less than the 85th percentile. A child is at risk of being overweight with a BMI-for-age from the 85th percentile to less than the 95th percentile. A BMI-for-age greater than or equal to the 95th percentile is classified as being overweight. There is no obese classification for children (2–19 years of age).

Adipose tissue (fat) that is deposited around the midsection of the body is more metabolically active than fat that is distributed in the extremities. Abdominal fat that is out of proportion to total body fat is an independent risk factor for obesity-related morbidity and mortality, even in individuals with a normal BMI. Waist circumference is used to assess the risk from abdominal obesity. Relative-risk cutoffs for waist circumference are gender specific, whereas BMI is independent of gender.

Nutrition

At the most basic level, weight gain occurs when calories taken in exceed calories expended. When a person eats more calories than he or she expends (through basal metabolism, thermic effect of food, and physical activity), he or she gains weight. If a person eats fewer calories, he or she loses weight. During the last 30 years, there have been changes in the nutrient composition of meals and portion sizes, which has contributed to the increasing calorie intakes of individuals. A public misperception regarding portion size and serving size further adds to the confusion.

Portion Size

Portion size is the amount of food or beverage that is consumed in a single eating event. Serving size is the standardized unit for measuring food that is used in dietary guidance. For example, a person might eat one bowl of pasta and consider it a serving; however, a serving size for pasta is half a cup. The bowl of pasta is the portion size that was consumed. Consider a typical breakfast from 30 years ago—coffee and a muffin. An 8-ounce cup of coffee with whole milk and sugar has approximately 45 calories. The portion size of a muffin 30 years ago was approximately 1.5 ounces (210 calories). At many restaurants today, a medium coffee (16 ounces) may have upward of 350 calories, while the muffin size has increased to

4 ounces (500 calories). This results in an increase of almost 600 calories for the same meal.

Consumers also equate size to value. When people eat in restaurants or purchase prepackaged foods, they expect a large portion for their money. Small portions are seen as cheap or insufficient, so restaurants respond by offering 12-ounce steaks and family-size bowls of pasta as single entrees. There is also an incentive to buy big at fast-food restaurants. Customers are offered the opportunity to upsize an order at minimal cost. Oversized portions are not limited to food. Beverage portions are also increasing. Soft drinks used to be served in 6- to 8-ounce portions; today consumers can choose between 12-, 20-, and 24-ounce containers. People can easily drink 150 to 180 calories per 12-ounce portion.

Breastfeeding and Infant Formula

The overconsumption of beverages starts in infancy. Formula-fed infants have their intake measured by how many ounces they consume from the bottle at each feeding. Parents often think that babies need to drink the entire bottle, even if the child shows signs that he or she is finished. When this happens, babies do not learn what satiety (fullness) feels like, and they may overeat when they are older. Breastfeeding provides an opportunity for babies to self-regulate caloric intake. Mothers are unable to measure how much milk is consumed from the breast, allowing babies to stop eating when they feel full. Some mothers may gauge consumption by monitoring how long each nursing session lasts; however, babies adjust their suck rate as hunger subsides. Nursing in response to hunger (nutritious nursing) may result in a higher milk intake than comfort nursing. The protective effects of breastfeeding on excessive weight gain in childhood may be dose dependent. The greater the opportunity children have to self-regulate intake, the more they are able to recognize hunger and satiety cues.

Parental Influence

Parental choice once children are weaned from breast milk or formula also affects the risk of excessive weight gain. When juice and juice drinks replace breast milk and formula, children consume

large amounts of calories with little nutritional value. These calorie-dense beverages often take the place of nutritious foods. Children also lose out on the beneficial effects of fiber and phytochemicals that are found in fruits and vegetables. Putting infants and children to sleep with bottles of juice or milk contributes to excessive weight gain and tooth decay. For many children, their only exposure to vegetables is in the form of French fries. Children often mimic their parents and caregivers when deciding what to eat. When children see their parents eating high-fat, sugary foods, they will want to do the same. If healthy foods, including fruits and vegetables, are regularly offered, children will develop an affinity for their taste. Including children in the food-purchasing and -preparation process can also entice them to eat a variety of healthy foods. After age 2, most children can safely switch to low-fat or fat-free dairy products. Parents should avoid adding salt to food, both during the cooking process and at the table. A preference for salty foods is an acquired taste—if children do not eat salty foods when they are young, most will continue to avoid them as adults.

Dietary Guidelines

The Dietary Guidelines for Americans have been published at least every 5 years since 1980. This joint venture by the U.S. Department of Health and Human Services (HHS) and the U.S. Department of Agriculture (USDA) aims to educate Americans on healthy eating habits. There is also an emphasis on how dietary intake can help reduce the risk of several chronic diseases, including obesity. These guidelines, commonly known as the Food Guide Pyramid, received a major revision that was released in 2005. The My Pyramid food guidance system is an interactive, Web-based system that allows users to customize calorie recommendations by age and gender. It also provides recommendations for pregnant and lactating women. This system incorporates physical activity recommendations to further encourage Americans to improve their health through lifestyle modification.

Lifestyle

Technological advances, such as television, computers, and automobiles, as well as the growth of

the nation's fast-food industry, have changed many individuals' lifestyles, contributing to the increase in obesity. Important elements of lifestyle are physical activity, screen time, and eating habits.

Physical Activity

The CDC and the USDA recommend at least 30 minutes of moderate-intensity activity for adults most days of the week to maintain health. To improve health and lose weight, 60 to 90 minutes of moderate-intensity activity are necessary. Children and adolescents should engage in moderate-intensity activities daily for optimal health. One way to measure daily physical activity is with a pedometer. A pedometer is a device that measures how many steps the wearer takes each day. Ten thousand steps per day correspond to approximately 60 minutes of moderate-intensity activity, or the amount recommended for healthy living and weight loss. By adjusting activities of daily living, it is possible to meet the recommended activity levels for most adults without exercising.

Individuals who are successful in maintaining their weight loss long-term have incorporated exercise into their lifestyle. Exercise enhances weight loss efforts by building muscle and bone mass and improving cardiovascular endurance. Exercise also helps control blood sugar levels, reduces blood pressure, and lessens feelings of depression and anxiety. Fifteen minutes of brisk walking or climbing the stairs for 15 to 20 (cumulative) minutes per day expends about 100 calories. The benefits of exercise are cumulative, so people can perform different activities throughout the day (in 10-minute increments) and still improve their well-being.

Screen Time

The American Academy of Pediatrics (AAP) recommends no more than 2 hours of quality screen time for children over the age of 2 each day and no screen time for children under the age of two. Screen time includes television viewing (including movies), computer usage, and playing video games. Data from the 1988 to 1994 National Health and Nutrition Examination Survey found that 26% of children watch more than 4 hours of television per day. These children had greater

BMI than children whose television viewing was limited to less than 2 hours per day, and they were less likely to engage in vigorous physical activity. Children who engage in regular physical activity that incorporates free play and structured activities are more likely to engage in regular physical activity as adults. As opportunities for physical activity decrease during the school day, it is important that parents encourage their children to engage in active behaviors after school and on weekends. Parents can model good behaviors by designating family activity times and making healthy choices for themselves. Praising children when they accomplish new goals will further encourage them to participate in physical activities.

Eating Habits

The increase in the number of fast-food establishments, loss of family meal times, and increase in the availability of convenience foods have all contributed to obesity. Many people do not eat breakfast because of time constraints or because they think it will help them lose weight. However, skipping breakfast contributes to overeating later in the day, both at mealtimes and with snacking. It has been found that children who skip breakfast have lower test scores and more difficulty concentrating in school.

Where people eat is almost as important as what they eat. Eating a majority of meals away from home tends to result in higher caloric intakes than if the majority of meals are eaten (and prepared) at home. The loss of the family mealtime has been identified as a contributory factor in childhood obesity. Family mealtime provides an opportunity for the entire family to step back from their hectic daily schedules and focus on the family unit. It also provides an opportunity for parents to model healthy eating behaviors for their children.

Prevention

There are many national-, state-, and local-level initiatives under way to combat the obesity epidemic. Nationally, Healthy People 2010 is setting the stage for improving the health of all Americans. Among their Leading Health Indicators (a list of

10 high-priority public health issues) are physical activity and overweight and obesity. The Safe Routes to School Program is one example of a Healthy People 2010 initiative to increase physical activity and reduce overweight status in children. This \$612 million program has been implemented in more than 20 states, providing support to local communities that are interested in increasing the number of children who walk or ride their bicycles to school. The Small Step campaign encourages Americans to make small efforts to improve their health and reduce their risk of weight-related medical problems.

Many states are now requiring BMI report cards; students have their BMI assessed annually at school, and the results are sent home to parents. Physicians in West Virginia will be provided with BMI wheels and training to encourage BMI assessments on all patients. And the Florida Department of Health has created the Hispanic Obesity Prevention and Education Program to help address the increasing prevalence of obesity among that ethnic group.

Nationally, Mexican American girls (under age 20) have the highest percentage of overweight; for boys, non-Hispanic Blacks have the highest percentage, followed by Mexican American boys. There is a similar trend in adult females—the age-adjusted prevalence of overweight and obesity is higher in non-Hispanic Black and Mexican American women than in non-Hispanic White women. There is little difference in prevalence among men in these three groups.

Research

Several genes are being studied to gain a better understanding of their role in regulating weight and appetite. These genes include leptin, proopiomelanocortin (POMC, a leptin receptor), prohormone convertase 1, melanocortin receptors 3 and 4, and transcription factor single-minded 1. The insulin gene is also being studied. Neurotransmitters such as serotonin, norepinephrine, and dopamine play a role in weight control and satiety and are the focus of several pharmaceutical products designed to treat obesity. The central cannabinoid (CB1) receptors are thought to play a role in the regulation of food consumption and may have a role in reducing hunger sensations.

Treatment

While many people are able to ameliorate their risk of weight-related illnesses by making healthy lifestyle choices, some are unable to achieve a healthy weight on their own. The 1998 National Institutes of Health's (NIH's) Clinical Guidelines on Managing Overweight and Obesity recommended that the U.S. Food and Drug Administration (FDA) approve weight loss drugs so that they may be used as an adjunct therapy to lifestyle modification in patients with a BMI of 30 or higher with no weight-related comorbidities or in patients with a BMI of 27 or higher with obesity-related comorbidities (or risk factors). Obesity-related comorbidities include diabetes mellitus, sleep apnea and obesity-related hypoventilation, asthma, nonalcoholic fatty liver disease, gallbladder disease, orthopedic problems, hyperinsulinemia, polycystic ovary syndrome, and metabolic syndrome (which may include hypertriglyceridemia, low-HDL cholesterol, hypertension, impaired glucose tolerance, and/or increased waist circumference).

Currently, the only FDA-approved medications for weight loss are sibutramine (Meridia) and orlistat (Xenical). Sibutramine is a norepinephrine, dopamine, and serotonin reuptake inhibitor that works by decreasing appetite. Orlistat is a gastric lipase inhibitor that reduces fat absorption in the intestines. Orlistat recently received FDA approval to be sold over the counter as Alli, although at lower doses than the prescription version.

In addition to pharmaceutical therapy, some obese individuals may benefit from bariatric (weight loss) surgery. There are four surgical procedures commonly performed in the United States for obesity: Roux-en-Y gastric bypass, adjustable gastric banding, sleeve gastrectomy, and biliopancreatic diversion (with or without duodenal switch). The adjustable gastric banding and sleeve gastrectomy work by restricting the amount of food that can be consumed at any given time by decreasing the size of the stomach pouch. The Roux-en-Y gastric bypass and biliopancreatic diversion provide restriction in addition to malabsorption. In both of these procedures, the size of the stomach pouch is reduced (restrictive component), and parts of the intestines are bypassed (malabsorptive

component). Bariatric surgery should be restricted to individuals with a BMI of 40 or higher or a BMI of 35 or more with obesity-related comorbidities. Bariatric surgery programs should include education on lifestyle modification and behavioral therapy. Only the adjustable gastric banding is reversible.

Future Implications

The etiology of obesity is multifactorial and difficult to treat. There is a clear environmental impact on the increasing rates of overweight and obesity. Expansive unhealthy food selections and decreased opportunities for physical activity are significant contributory factors to America's expanding waistline. What is not fully understood is the role of genetics in the obesity epidemic. Animal studies looking at the role of various genes in appetite regulation and weight control are not easily reproduced in humans. Until scientists are able to discern the true role of genes in the obesity epidemic, it is up to families and each individual to make healthy lifestyle decisions to reduce the risk of becoming obese.

Elisa Stamm Kogan

See also Chronic Diseases; Diabetes; Disease Management; Health; Healthy People 2010; Inner-City Healthcare; Preventive Care; Public Health

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 Healthy People 2010: <http://www.healthypeople.gov>
 My Pyramid Food Guidance System: <http://www.mypyramid.gov>

O'LEARY, DENNIS S.

Dennis S. O'Leary is the former long-time president of the Joint Commission, the leading health-care accrediting body in the United States. Under his leadership, the Joint Commission's accreditation process successfully changed from being primarily focused on the structural measures of healthcare organizations to process measures and care-related outcomes. He also started cutting edge healthcare standards relating to pain management, patient safety, emergency preparedness, and the use of patient restraints. And he launched a series of public policy initiatives.

A Kansas native, O'Leary earned a bachelor's degree from Harvard University and a medical degree from Cornell University Medical College in New York. After 2 years of internal medicine training at the University of Minnesota Hospital, he completed his residency and a hematology fellowship at Strong Memorial Hospital in Rochester, New York. He is board certified in Internal Medicine and Hematology.

Prior to joining the Joint Commission, O'Leary spent 15 years at the George Washington University Medical Center in Washington, D.C. At the medical center, he was a professor of medicine, and he served as a senior manager in several positions. He was the medical director of the university's hospital for 10 years, the dean for clinical affairs at the university, and the vice president of the university's health plan, an academic health maintenance organization (HMO). In 1981, O'Leary received national attention for his role as the university hospital's spokesman for the care given to President Ronald Reagan after he was shot in a failed assassination attempt. He frequently briefed the national and international news media about the president's medical progress.

O'Leary became president of the Joint Commission in 1986. During his 21 years at the Joint Commission, he greatly expanded its scope and size. Under his leadership, the organization moved beyond its original hospital base to accredit a wide range of extended-care and ambulatory-care service organizations. It initiated an international accreditation program and a consultation services program. And the organization undertook a series of projects with the World Health Organization (WHO). Under O'Leary, the Joint Commission's budget and staff quadrupled in size.

During his career, O'Leary received many awards and honors. He is a member of the National Academy of Sciences, Institute of Medicine (IOM). He also is a master of the American College of Physicians and a fellow of the American College of Physician Executives, the American College of Healthcare Executives, and the American Dental Association. In 2000, *Modern Healthcare* magazine identified him as one of the nation's 25 most influential leaders in healthcare during the past quarter-century. In 2005, he was given the Distinguished Service Award, the highest honor from the American Medical Association (AMA), for his advancement of healthcare quality and patient safety. And in 2006, he received the Ernest Armory Codman Award from the Joint Commission for his leadership role in using performance measures to improve healthcare quality and safety.

After leaving the Joint Commission at the end of 2007, O'Leary was appointed to the board of directors of the Consumers Advancing Patient Safety (CAPS), an organization that promotes patient-centered healthcare.

Ross M. Mullner

See also Accreditation; Joint Commission; National Patient Safety Goals; ORYX Performance Measurement System; Outcomes Movement; Patient-Reported Outcomes (PRO): Quality of Healthcare; Structure-Process-Outcome Quality Measures

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Joint Commission: <http://www.jointcommission.org>

ORYX PERFORMANCE MEASUREMENT SYSTEM

ORYX is a tool used by healthcare organizations to evaluate their ongoing performance and to inform continuous quality improvement efforts. The ORYX initiative was developed and implemented by the Joint Commission and came into use in 1997. This system for the first time included performance and outcome measures in the accreditation process that was applied to hospitals, long-term care organizations, and healthcare networks. ORYX was later expanded to also include behavioral healthcare and home care organizations.

The concept of ORYX was to be a continuous, data-driven process that evaluates a healthcare organization’s standard of compliance and the outcomes of this process. Joint Commission officials note that ORYX provides purchasers and consumers of care with another level of assurance that Joint Commission–accredited organizations are evaluated on outcomes in addition to the on-site surveys that take place.

Initial policies regarding ORYX called for accredited healthcare organizations to select two of the approved measures, also known as noncore measures, and to report data on at least 20% of the patient population from a list of 60 performance measurement systems that met the Joint

Commission’s criteria. This information was to be collected on monthly data points and transmitted on a quarterly basis in an electronic machine-readable format via the Internet or electronic bulletin board services to an approved Performance Measurement System (PMS). The Joint Commission delayed the reporting of core measures for long-term care, home care, and behavioral-health organizations so that applicable core measures could be identified. This was in response to the lack of national consensus on appropriate performance measures for nonhospital settings of care. ORYX provides healthcare organizations with a greater degree of flexibility in selecting measures, which was identified as a problem in the past under the Indicator Measurement System (IMSystem).

In July 2002, the first ORYX measures on accredited hospitals were collected. Hospitals are required to collect and report on at least three core measures or up to nine measures if not participating in core measurement activities, to satisfy the requirements of accreditation. Nonhospitals must collect six measures to satisfy accreditation requirements. To reduce the burden of reporting requirements for hospitals and other healthcare organizations, the Joint Commission has worked closely with the Centers for Medicare and Medicaid Services (CMS), the National Quality Forum, and other entities to develop and standardize these core measures.

One criticism of the ORYX program is that healthcare organizations may focus their quality improvement efforts on only the reported measures of quality or selected measurements that they perform well on. In addition, critics cite that the measures only represent a small number of medical conditions. The Joint Commission concedes these facts; however, it is acknowledged that healthcare organizations will eventually have to report measures on a greater percentage of their population. Some professionals question how performance data will correlate with hospital accreditation and the ability of the Joint Commission, a private organization supported by the hospital industry, to objectively evaluate hospital performance.

History

The Joint Commission’s history of performance measurement can be traced back to the early days

of Ernest Codman, who established the concept of the data-driven “end-result” system in the 1900s. The Joint Commission’s Agenda for Change had at its centerpiece the goal of incorporating performance measurement into its accreditation process. During the period leading up to this, beginning in 1986, the Joint Commission was in the process of developing, testing, and implementing standardized performance measures and also establishing the infrastructure to transmit and collect these performance measurement data. This initiative was known then as the Indicator Measurement System (IMSystem). The reason for the development of the IMSystem was that until this point compliance with standards was the basic measure of healthcare quality. This new paradigm to look at the actual results and outcome of care called for a more integrated approach to evaluation of healthcare organizations. The use of performance data by the Joint Commission would facilitate the quality improvement efforts of healthcare organizations, ensure accountability, and combine performance with standards compliance in the accreditation process.

The IMSystem was to be a national comparative measurement system comprising indicators of outcome and process measures that would reflect the appropriateness or effectiveness of performance. Outcome indicators were also to be appropriately risk adjusted to account for differences in patient-level factors. The set of performance measures under the IMSystem included perioperative care, obstetrical care, trauma care, oncology care, infection control, and medication use. The goal at the time was that hospitals would collect and start to transmit data on these measures beginning in 1995 but they would retain choice and flexibility in selecting appropriate measures to report on. The IMSystem did not take off due to the quickly changing measurement environment and because many hospitals felt that this project was not practically feasible. Although the IMSystem never reached fruition, it served as the predecessor for the new ORYX initiative. With changing knowledge, the Joint Commission revised its original performance measures and pursued a collaborative approach in the ORYX initiative.

In 1999, the Joint Commission sought input from healthcare professionals about the initial set of hospital core measures. The Attributes of Core

Performance Measures and Associated Evaluation Criteria were used to evaluate candidate measures as potential core measures. After the core measures were developed, the Joint Commission initiated a pilot project to test the feasibility and usefulness of these measures. Out of the 11 state hospital associations that were interested in participating in this project, 5 (Connecticut, Michigan, Missouri, Georgia, and Rhode Island) were randomly selected to participate and identify a single performance measure system and participant hospitals. Through this pilot demonstration, the Joint Commission was able to receive feedback, as well as modify and assess the reliability of the core measures. After this feedback period, the Joint Commission made a series of revisions to the initial core measures prior to the full-scale implementation of this project.

During 1995, a request for PMSs to participate in the ORYX initiative was made. Candidate PMSs were evaluated against specified characteristics known as the Attributes of Conformance. The Attributes of Conformance were created by the Joint Commission to ensure that PMSs had the technical and operational infrastructure necessary to support this performance measurement initiative in the present as well as the future. The attributes of PMSs typically included appropriate performance measures that focused on organization performance, clinical processes and/or outcomes, operational database, processes that ensure data quality, risk adjustment methods, feedback to participating organizations, and usefulness and relevance to the accreditation process. The initial attributes were defined at the minimal level; however, they have been modified several times because of the growing need to maintain data quality.

After candidate PMSs passed this initial evaluation, a “request for indicators” was issued to receive PMS extant measures for review, evaluation, and approval for use in ORYX. Once they were approved, healthcare organizations could select these measures to satisfy the requirements of ORYX. The Joint Commission’s database stores more than 15,000 extant performance measures.

PMSs that satisfied the selection criteria were listed for accredited healthcare organizations to select and contract with in order to meet accreditation requirements. PMSs serve as an intermediary between the Joint Commission and accredited healthcare organizations to receive and aggregate

transmitted data. PMSs ensure data quality, analyze and risk adjust the data, and provide feedback to participating organizations. At present, more than 400 PMSs have been evaluated, and 98 PMSs currently participate in the ORYX initiative.

Once the Joint Commission receives the aggregated data from the PMSs, the data are passed through an automated filter process. The Joint Commission developed a software application to compare incoming data against specific statistical process control decision rules, known as the Auto-Stat process. All the data reported are run through this application, which provides comparative information and helps identify any outliers. Only data that have passed through this filtering process are then included in the Joint Commission's database. The Joint Commission conducts three types of analyses on its data: data quality assessment, intraorganizational analyses, and interorganizational analyses. These data are important in the Joint Commission's Priority Focus Process aligned with its new accreditation process, Shared Visions-New Pathways.

Data quality is assessed through the data filter process, through PMS audits, and during the on-site survey of accredited healthcare organizations. Intraorganizational analyses involve the use of control charts to assess the processes involved in the results being measured. This analysis includes evaluating the data to examine trends and patterns in organizational performance and identifying areas for improvement. The organization-specific data are also used to develop a customized on-site survey agenda and will be factored into the accreditation decision-making process. To evaluate whether an organization is performing within an acceptable range during a given period of time, the Joint Commission conducts a comparative interorganizational analysis. This analysis entails comparing an individual organization with a comparison group's data, which is then summarized in a comparison chart. The comparison chart includes an organization's observed rate, the expected rate, and the expected range or acceptance interval associated with the expected rate.

When the Joint Commission initially began to use performance measurement data, it was focused primarily on the presurvey report during the on-site visit. This presurvey report was tailored specifically for each accredited healthcare organization and

included a control and comparison chart for each measure selected. The control chart examined the organization's performance over time, while the comparison chart compared the organization with other organizations collecting the same measures.

The Joint Commission also commenced to use ORYX data to detect sentinel events at facilities. If the Joint Commission learns of a sentinel event through the quarterly reporting by hospitals, this will be considered to be self-reported by the healthcare organization and would require a root-cause analysis and action plan or an evaluation of the response.

Some limitations of the ORYX initiative are that small rural hospitals do not typically have enough cases of events to draw any meaningful conclusions. Thus, hospitals with an average daily census of fewer than 10 patients and a monthly ambulatory population of fewer than 150 patients are currently exempted from submitting data on the ORYX requirements. Additionally, the issue of multiple comparisons of organizations across time and cross-sectionally may have resource implications.

As new technologies rapidly emerge and advances are made in healthcare, the Joint Commission must continue to find ways to adapt to reflect the growing sophistication of performance measurement. To meet this challenge, the Joint Commission's Performance Measurement Strategic Issues Work Group has developed areas of focus for the next 5 years. These focus areas include refining the receiving of standardized-performance measurement data from participating healthcare organizations, expanding the breadth of measure sets available that healthcare organizations may select, creating applications that will be able to use measurement data in the accreditation process as well as public reporting efforts, coordination of data demands and prioritization of measurement areas to reduce data collection burden and eliminate duplication for healthcare organizations, and continued support for the role of the National Quality Forum as the leader in setting measurement objectives.

Ongoing Activities

At present, the Joint Commission has identified five core performance measure sets for hospitals: (1) myocardial infarction, (2) heart failure,

(3) pneumonia, (4) pregnancy and related conditions, and (5) surgical infection prevention. Additionally, intensive-care unit (ICU), pain management, children's asthma care, and hospital-based psychiatric-service measures are scheduled to be implemented soon.

The process involved in creating these measures includes working with a technical expert panel, testing, and development of technical specifications. All these core measures have been reviewed and approved by the National Quality Forum.

Quality Check[®] was established the same year as the ORYX initiative and serves as a directory of accredited organizations and performance reports available for public use on the Joint Commission's Web site. In 2004, the debut of Quality Report became available to the general public at www.qualitycheck.org, which allowed easy access to organization-specific data that included composite scores for each set of reported measures. This result is displayed against comparative state and national data.

The use of measurement data in the accreditation process has also grown with the evolution of these measures. In addition to being used for continuous quality improvement efforts of healthcare organizations and the Joint Commission's presurvey report, performance measures are also used to focus on the on-site accreditation survey through the Priority Focus Process (PFP). The PFP compiles data from various sources and identifies one or more focus areas for the on-site survey.

Data management efforts of ORYX data have also evolved over time with newer methods. In the beginning of the ORYX initiative, data quality was focused primarily on missing data and outliers. Data integrity became even more important with public reporting and the core measures. As a result, the Joint Commission continues to monitor data quality after each quarter of data submission. Currently, the issues involved in the data management of ORYX include the aggregation of data and the reliability of data collection.

Other Health Quality Initiatives

In 1999, the National Quality Forum was formed to review and approve performance measures. The National Academy of Sciences, Institute of Medicine's report *Crossing the Quality Chasm*

outlined the quality improvement objectives for the nation. With many actors now involved in health-care quality, the Joint Commission became engaged in initiatives such as the Hospital Quality Alliance.

The federal CMS heads a program similar to the Joint Commission's ORYX, known as the Hospital Quality Alliance: Improving Care Through Information. This is a public-private partnership aimed at improving care in the nation's hospitals by measuring and publicly reporting on this care. This program collects information on hospital performance measures for heart attack, congestive heart failure, pneumonia, and surgical infections, and it plans to continue to expand in the future. This initiative grew out of the collaboration between the CMS, American Hospital Association (AHA), Federation of American Hospitals, and Association of American Medical Colleges (AAMC) and is supported by the Agency for Healthcare Research and Quality (AHRQ), National Quality Forum, Joint Commission, American Medical Association (AMA), American Nurses Association (ANA), National Association of Children's Hospitals and Related Institutions, Consumer-Purchaser Disclosure Project, American Federation of Labor and Congress of Industrial Organizations (AFL-CIO), AARP, and U.S. Chamber of Commerce. A *Hospital Compare* report, which provides an easy to use interface on hospital performance, can be found at www.hospitalcompare.hhs.gov.

Future Goals

The Joint Commission envisions that performance measurement will become a seminal part of the information technology infrastructure. Some future objectives of the Joint Commission's performance measurement data include the following: the creation of a national standardized data set, continuous data monitoring and follow-up with healthcare organizations to identify areas for ongoing improvement, refining standards through the use of measure data, including measurement data in the AHRQ's National Health Care Quality and Disparities Reports, the use of measurement data to improve the quality of care through research, the use of measurement data to identify high-reliability healthcare organizations, the use of measurement data to identify evidence-based practices and establish national benchmarks,

establishing processes to support increased use of measurement data by consumers, and the use of measurement data to ascertain healthcare organization reimbursements levels.

The development of new core measures will eventually replace noncore measures in nonhospital areas (long-term care, ambulatory care, home care, and behavioral health). Additionally, the Joint Commission plans to seek patient-level data, which will ensure higher levels of data quality; information regarding development; increased research related to performance measurement and quality improvement efforts; increased support for the Joint Commission's new accreditation process; and ongoing support of efforts to ensure the relevance, usefulness, reliability, and validity of the measures.

With the increasing sophistication of medical care, the Joint Commission will continue to identify measures that are no longer relevant and will find ways to randomly collect data on these "retired" measures. Additionally, the Joint Commission expects to implement patient perception of care as a core measure over the next several years through a standardized hospital patient experience-of-care tool, known as the CAHPS Hospital Survey.

As the Joint Commission continues to work with its national partners in quality improvement and performance measurement efforts, it is guided by the continued expansion and coordination of nationally standardized core measurement capabilities and increasing the use of measurement data for quality improvement efforts, benchmarking, accountability, decision making, accreditation, and research. It is anticipated that the attainment of these goals will lead to the continued improvement in patient safety and quality of healthcare organizations.

Jared Lane K. Maeda

See also Joint Commission; National Quality Forum (NQF); O'Leary, Dennis S.; Outcomes-Based Accreditation; Outcomes Movement; Quality Indicators; Quality Management; Quality of Healthcare

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Web Sites

Hospital Compare: <http://www.hospitalcompare.hhs.gov>

Joint Commission: <http://www.jointcommission.org>

National Healthcare Quality Report:

<http://nhqrnet.ahrq.gov/nhqr/jsp/nhqr.jsp>

OUTCOMES-BASED ACCREDITATION

Outcomes-based accreditation is an objective, data-driven process of externally evaluating providers, healthcare facilities, or health plans through the use of performance measures. Risk-adjusted outcome measures, such as mortality, quality of life, patient functional ability, and patient satisfaction, are used to compare among providers of care and healthcare organizations to make choosing a provider more meaningful to patients since patients are ultimately concerned about their health outcomes.

History

Florence Nightingale was the first to study health outcomes by measuring mortality and infection rates in British military hospitals during the Crimean War. In the early 20th century, a pioneering physician at the Massachusetts General Hospital in Boston, Ernest Codman, proposed an *end-results system* to examine patient outcomes of surgical procedures. At the time, Codman's idea was viewed as radical and against the medical establishment. Building on Codman's idea, Avedis Donabedian developed a framework for quality assessment that included structure, process, and outcomes. Structure refers to the structural characteristics of healthcare organizations, such as the number of certified staff, equipment, and medical technologies; process includes all the processes involved in providing care to the patient; and outcomes are the results of the care rendered by the provider.

Historically, accreditation reviews were primarily based on structural features since they were easy to measure; however, recently there has been a movement to further examine process and outcomes measures that give a more comprehensive view of patient care quality and enable consumers and purchasers to make informed healthcare decisions. By using the framework of Donabedian and Codman's end-result system, organizations such as the National Committee for Quality Assurance (NCQA) and the Joint Commission have started using outcomes to accredit health plans and healthcare facilities.

Accrediting Organizations

The NCQA, a private, nonprofit organization, is dedicated to improving healthcare quality by accrediting and certifying a wide range of healthcare plans through its set of performance measures known as the Health Plan Employer Data and Information Set (HEDIS). The mission of the NCQA is to provide information to purchasers and consumers on the quality of care of managed-care organizations that will allow them to make informed purchasing decisions. Beginning with HEDIS 3.0, the NCQA started to make progress by including the outcomes measures of patient function and satisfaction in its evaluation process. The major barrier to the initial implementation of

outcomes measures in HEDIS was the lack of information technology infrastructure to capture these measurements. NCQA's report *A Road Map for Information Systems: Evolving Systems to Support Performance Measurements* outlined the upgrades needed to meet the demand of outcomes measurement.

The Joint Commission, an independent, private, nonprofit organization, accredits and evaluates approximately 15,000 healthcare organizations and programs in the United States. In 1997, the ORYX Performance Measurement System for the first time integrated performance measures into the Joint Commission's accreditation process. Beginning in July 2002, the first core measures on accredited hospitals were collected.

The purpose of ORYX is to link patient outcomes with accreditation to make the accreditation process more valuable while focusing on patient-centered care. ORYX is used as a supplement to the standards-based survey by continuously monitoring the performance of organizations, facilitating continuous quality improvement, and targeting the on-site survey. To meet accreditation requirements, some healthcare organizations must submit data on a specified minimum number of measures to a performance measurement system or the Joint Commission, and these data are reviewed by the surveyor(s) at the on-site survey. Using data reported from the organization's core measures, the surveyors assess the performance improvement activities of the organization during the on-site survey.

The Joint Commission intends to use ORYX to identify data trends that will enable organizations to improve the quality of care. To reduce the burden of reporting requirements for hospitals, the Joint Commission has worked closely with the Centers for Medicare and Medicaid Services (CMS) to align performance measures.

Issues of Using Outcomes

The contention surrounding the use of patient outcomes in accreditation includes the issues of risk adjustment, the case-mix of patients, and the small number of cases of individual providers. Risk adjustment is a statistical method that tries to control for the differences in patient characteristics or case-mix that may unduly affect outcomes. For example, a provider that treats a greater number

of sicker patients may appear to have worse outcomes than a provider that treats relatively healthier patients. Therefore, risk adjustment statistically adjusts for these underlying differences in the case-mix of patients.

The issue of small numbers is also a problem that arises where providers may not treat a sufficient number of cases to draw statistically valid conclusions regarding a provider's performance. This may limit the comparisons that can be made among providers for a given set of conditions.

Other issues concerning the use of outcomes include the fact that a patient's outcome is shaped by many other factors outside the provider's control, even if appropriate care was given. Conversely, a patient may still have a good outcome despite the poor processes of care delivered by the provider due to the resiliency of the human body. Additionally, it may take many years before a particular health outcome is observed, and therefore, outcomes may need to be tracked longitudinally for an extended period. Furthermore, data on health outcomes can be labor intensive, costly, and difficult to collect.

The field of outcomes measurement is still young, where there are only a few available measures for specific conditions. Measuring outcomes for the purposes of accreditation relies on the collection of valid and reliable data; standardized data elements and definitions; appropriate risk adjustment methods; information technology infrastructure; and the ability to compare outcomes across providers, organizations, and health plans.

Future Implications

Outcomes measures in accreditation will continue to play an important role in evaluating healthcare providers, organizations, and health plans. The development of additional measures of outcomes will be needed to broaden the set of conditions available. With the greater availability of outcomes measures through accrediting bodies, consumers and purchasers will be able to make more informed decisions of where to seek and purchase their care and will continue to pressure healthcare providers, organizations, and health plans to continuously improve the quality of care they deliver.

Jared Lane K. Maeda

See also Accreditation; Case-Mix Adjustment; Healthcare Effectiveness Data and Information Set (HEDIS); Joint Commission; National Committee for Quality Assurance (NCQA): ORYX Performance Measurement System; Outcomes Movement; Structure-Process-Outcome Quality Measures

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<http://www.ncqa.org>

OUTCOMES MOVEMENT

The outcomes movement is an initiative designed to improve the quality of healthcare by identifying what works (and encouraging its use) and what doesn't (and discouraging the use of those

treatments). It establishes links between health-care practices and procedures with specific outcomes, for the patients as well as the healthcare system. It involves evaluating in a scientific manner the consequences of medical care, diagnostic testing, and other services. This information is then pooled and analyzed and made available to the medical-practice community, healthcare administrators, and third-party payers. The goal is the development of care guidelines that improve patient outcomes and result in effective and efficient healthcare organization and delivery.

In the past, medical-care practices often developed because of anecdotal information and the experience of the individual physician and his or her colleagues. At times, this led to geographic differences in the use of a particular medical intervention. In such cases, the geographical area in which the patient would be treated served as an important predictor of the selected treatment protocol. The outcomes movement is an attempt to develop, as an alternative, a data-driven approach that makes sense across the board. This is done by systematically collecting information about patients and the medical interventions they experience. The outcomes of those interventions for the patient and the healthcare system are then documented and made available to the medical/patient community. These data are analyzed and the results used to develop best practices to improve the quality of care.

History

The value of outcomes measurement was recognized in the early 1900s, when Ernest A. Codman (1869–1940), a New England surgeon, said that treatment results and benefits should be documented. Codman created “end-result cards,” which contained basic patient demographic data, the diagnosis, the treatment, the short-term outcomes, and, when possible, the outcomes after 1 year. He contended that this type of information was necessary to make sound judgments about treatment efficacy. The movement became energized in the 1960s with the work of Avedis Donabedian (1919–2000), a physician and public health academician with a strong interest in healthcare quality. Donabedian’s quality model began with structure (the medical facilities and personnel), continued with process (the treatment),

and led to the outcomes (the effects of the care on patients). Donabedian stated that outcomes are crucial to judging the value of medical care and noted that mortality data alone are not sufficient. Quality-of-life indicators and patient satisfaction, though less easily measured, are also relevant and should be studied as well, in his view. At this point, the outcomes movement focused primarily on the patient rather than the healthcare delivery system as a whole.

The rapid rise in healthcare costs in the 1970s and 1980s has put the outcomes movement into an additional context. The focus now includes the financial issues and the concomitant effects on the medical system, insurance reimbursement, and federal programs. Technological innovations, the cost of new drugs and therapies, and the aging of the nation’s population have thrust the issue of medical-care costs into the forefront. Insurance companies and other third-party payers as well as clinicians and hospital administrators have sought to distinguish between available therapies and those that work and matter. Researchers began to take note of the fact that different geographical areas exhibited wide variation in the use of resources and in the rates of certain medical procedures. After much investigation, however, the researchers did not find any meaningful differences in population characteristics and patient outcomes. This suggested, for example, that some surgical procedures were unnecessary, and limiting them to situations in which they would provide benefit could help contain rising costs. Other research claimed to demonstrate the lack of efficacy of some traditionally used interventions. By the 1990s, assessment and data-driven healthcare became the new mantra, and the outcomes movement came of age.

Current Usage

The outcomes movement provides an important framework for reviewing and refining medical care. Simply put, positive outcomes support the treatment or policy being studied, and negative outcomes suggest modification/elimination of that approach. At its best, outcomes research can provide information about the efficacy of the treatment and care, improve quality, save money, alter public policy in beneficial ways, and guide decision making.

As physicians and patients increasingly are able to obtain aggregated information about the harms and benefits of a medical intervention, they can make appropriately informed decisions. The medical community also uses this information to develop best practices—that is, the identification of treatment guidelines that work most effectively and with maximum benefit to the patients in specific situations. This information likewise is being used to develop and modify public policy as agencies strive to incorporate evidence in their public health initiatives. This includes disease prevention as well as the development of cost-effective and efficient disease-screening recommendations.

The trend toward shared or patient-centered decision making, likewise, has spurred interest in outcomes data. Patients increasingly are doing their own searches to ascertain the benefits and harms of specific treatment alternatives and seeking that kind of data from the medical profession. Outcomes data about survival and function probabilities are intrinsic to these efforts.

Health outcomes data are now multifaceted and include not just mortality data but also quality-of-life measures, such as the ability to function. In addition, outcome data about patient attitudes and satisfaction are becoming increasingly important to clinicians and hospital leadership, in part due to the competitive healthcare environment. Data can come from administrative and clinical databases, disease registries, clinical trial data, and census information, with an emphasis on large and more inclusive databases.

However, some critics of outcomes-based recommendations argue that solely relying on aggregated data doesn't allow for the flexibility that is necessary to adapt to the needs of the individual patient. The desire to eliminate variation can lead to treatment protocols that are too standardized, in this view. Counterarguments state that outcomes data are principally valuable when medical interventions have been carefully and thoroughly studied. Many ambiguities exist in diagnosis and treatment; so individual physician interpretation is and will continue to be crucial in complex cases. Other critics have argued that outcomes research initiatives have design limitations and are primarily cost containment strategies. Public programs such as Medicaid and Medicare require that outcomes data be designed to improve the

quality of care as well as to study and monitor resource utilization.

Economic studies can be done in various ways; they can take into account cost-to-outcome data, which focus on the cost of treating a disease. Cost-effectiveness studies compare the cost of one treatment over another and the benefit of that treatment over the other in terms of a specific outcome. Cost-utility studies weight outcomes according to how they are valued. The structure-process-outcome taxonomy has been found to be useful in studying administrative and economic effects on systems. Administrative outcomes studies focus on structure, process, and personnel. Economic outcomes may include the cost of care, unnecessary or inappropriate care, length of patient stay, patient readmission, return to work, and the ability to provide self-care.

Government financial support has been an integral part of these initiatives, with research funded through organizations such as the Agency for Healthcare Research and Quality (AHRQ). Research supported by the AHRQ and other government organizations has become part of the report card for healthcare purchasers and consumers to judge healthcare quality.

The AHRQ has established evidence-based practice centers, which are designed to analyze information and develop recommendations that are relevant to decision makers. The focus areas now include the U.S. Preventive Service Task Force, which reviews evidence in clinical prevention initiatives and provides technical support; the Technology Assessment Program, which studies the clinical utility of medical interventions to help the Centers for Medicare and Medicaid Services (CMS) make outcomes-based decisions for the Medicare program; the Generalist Program, which reviews a broad spectrum of clinical, behavioral, economic, and health system delivery issues; the Effective Health Care Program, which provides comparisons of effectiveness studies for patients, clinicians, and policymakers to use in making their decisions; and the Scientific Resources Center, which provides scientific and methodological assistance to several of the above programs.

These efforts, and others that will occur in the future, are designed to provide the basis for continuous quality improvement, as medicine strives to improve patient outcomes and to do so

within an efficient and effective healthcare delivery system.

Mary C. Odwazny

See also Agency for Healthcare Research and Quality (AHRQ); Centers for Medicare and Medicaid Services (CMS); Codman, Ernest Amory; Cost-Benefit and Cost-Effectiveness Analysis; Donabedian, Avedis; Health Report Cards; Quality Indicators: Quality of Healthcare

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- Centers for Medicare and Medicaid Services (CMS): <http://www.cms.hhs.gov>
- Health Grades: <http://www.healthgrades.com>
- Joint Commission: <http://www.jointcommission.org>

OUTPATIENT CARE

See Ambulatory Care

P

PACIFIC BUSINESS GROUP ON HEALTH (PBGH)

The Pacific Business Group on Health (PBGH) is a large California healthcare business coalition. The PBGH includes more than 30 large companies as well as a subcoalition of more than 20 high-tech businesses. In total, these members represent more than 3 million employees, dependents, and retirees, accounting for about \$10 billion in annual healthcare expenditures. To become a member of the PBGH, an employer must have at least 2,000 covered lives in California. Excluded from membership are healthcare consulting groups, insurance companies, health plans, hospitals, medical groups, and any other healthcare industry employers. The coalition is active in healthcare purchasing, quality improvement, and consumer engagement in health decision making.

Overview

The PBGH was founded in 1989 in San Francisco, California, with the mission of seeking to improve the quality and availability of healthcare while moderating costs. The actions taken to realize this mission have evolved from evaluating health plans to assessing other levels of healthcare delivery, such as hospitals, provider groups, and individual providers, as well as engaging the individual consumer in the process of quality assessment and cost moderation.

In the coalition's 1st years, the process of obtaining information from health plans was not in place and was not yet possible. In 1991, the PBGH introduced the Consumer Assessment Health Plan Survey, which began with a survey of the use of prevention guidelines by health plans. The survey revealed large variations. The PBGH used this information to bring together health plans to set guidelines on preventive services and to communicate these guidelines to providers. Observing the lack of data collection and reporting in California, the PBGH formed the California Cooperative Healthcare Reporting Initiative (CCHRI) in 1993. The CCHRI, which is managed by the PBGH, is a collaborative of healthcare purchasers, health plans, and many healthcare providers that produces a yearly report of performance data through a single process. Data collection and reporting has become a collaborative rather than competitive process for this group. In 2001, the CCHRI agreed on standardized diabetes treatment guidelines for the state's health plans and medical groups. The Ambulatory Quality Alliance (AQA) named the CCHRI as one of six organizations in the country to pilot physician-level performance information in 2006.

In 1996, the PBGH launched its consumer information initiative through its HealthScope. The information on the Web site is generally used by members of the PBGH to customize information for their own employees so they can make value-based decisions about their health plan. In later years, HealthScope began to include quality information on hospitals and medical groups.

Moving forward, the PBGH now also plans to assess how best to communicate physician-level choice information.

In 1997, the PBGH won a state bid to privatize a small-group purchasing pool called the Health Insurance Plan of California. The PBGH renamed the pool Pacific Health Advantage and within 4 years enrolled 147,000 members through 11,000 small employers.

The PBGH also helped form the Leapfrog Group in 2000 to communicate hospital performance measures to consumers. During this time period, the PBGH also partnered with the State of California to ask hospitals to voluntarily report performance measures related to coronary artery bypass graft (CABG) surgery. The PBGH followed in the footsteps of New York State and published risk-adjusted outcomes reports available on its HealthScope Web site. Two out of every three hospitals voluntarily participated, and, following the successful publication by the PBGH, legislation was passed in California to make the reporting mandatory starting in 2003.

That same year, the PBGH piloted a program to measure the clinical performance of individual physicians. This effort was furthered by convening a national meeting in 2004 to outline the technical and methodological issues facing the task of assessing individual physician performance. The report, *Advancing Physician Performance Measurement: Using Administrative Data to Assess Physician Quality and Efficiency*, presented significant challenges and a road map for the future. In 2005, the PBGH worked with the California Medical Association and other stakeholders to deliver unprecedented consensus on physician performance measurement. The PBGH is already providing national leadership in developing measurement and reporting systems for individual physicians, and an expanding leadership role figures largely in their plans for the future.

The PBGH's role in purchasing healthcare and controlling costs is directly manifest in The Negotiating Alliance, a mutual benefit corporation. The Negotiating Alliance promotes value-based purchasing through an annual Request for Proposals and a negotiating process on behalf of 400,000 covered lives. The alliance leverages the power of 19 large employers to obtain the best pricing as well as accountability for quality.

Future Implications

The PBGH has written and published many articles, reports, and press releases. The organization has provided testimony to many government commissions and legislatures and has offered its expertise through participation in many forums and meetings. The PBGH, through pilot programs of healthcare measurement and consumer participation, is an active participant in practical health services research. While the PBGH represents many companies with several million covered lives, its influence on healthcare delivery, both statewide and nationally, eclipses this direct service to its members. The PBGH is shaping the healthcare environment of tomorrow by providing leadership on health services measurement and the process of involving consumers in using that information.

Gregory Vachon

See also Cost of Healthcare; Health Report Cards; Leapfrog Group; Midwest Business Group on Health (MBGH); National Business Group on Health (NBGH); National Coalition on Health Care (NCHC); Outcomes Movement

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<http://www.pbgh.org>

PAIN

The word *pain* derives from Sanskrit and Latin roots: *pu*, meaning purification, and *poena*, meaning punishment. Pain can be physical, psychological, or sociocultural. Pain can be manifest in a variety of forms, such as back pain, bone pain, and tooth pain. Pain is a subjective and variable experience and depends on the individual, as individuals may have different thresholds. Pain is a symptom of many medical conditions, and it can have a significant impact on an individual's quality of life and daily functioning. The diagnosis and treatment of pain is based on its classification according to its duration, intensity, type, source, and location. For example, pain can be classified as either acute or chronic. Most bodily pain is able to be resolved with little or no intervention and is generally considered to be acute pain. Chronic pain, also known as persistent or intractable pain, on the other hand, is considered to be an illness and not a symptom.

Pain can be defined in many different ways. One commonly used definition defines pain as an unpleasant experience that can be sensory or emotional in nature, is generally associated with possible or actual damage to bodily tissues, and is expressed through an individual's behavior.

Importance

Pain plays an important role in health services research. Specifically, it directly affects access, cost, quality, and outcomes of healthcare. For example, the occurrence of pain is one of the most common reasons for a physician visit by individuals, resulting in about half of all Americans seeking medical care each year. In addition, pain causes visits by individuals to other ancillary healthcare providers, including physical therapists, occupational therapists, nurses, and psychologists, among others, as well as visits to complementary and alternative medical providers

such as acupuncturists and massage therapists. The annual cost associated with pain exceeds \$5 billion in the United States.

There are several burdens associated with pain, including costs of healthcare, disability, and lost productivity. Pain is one of the leading causes of disability and functional problems. Furthermore, back, neck, and upper extremity pain are cited as the most common reasons for being sick and taking time off from work, resulting in work and productivity losses. An estimate from a national health survey found that about 18% of U.S. workers experienced approximately 149 million days of lost work due to back pain.

Models of Pain

Historical models of pain include Descartes's mind-body model. The Cartesian model of pain held that there is a direct connection between the nerves and the brain and had a dualistic view of mind and body. Pain is the result of an injury that causes a sensation in the person's mind. The model assumed that the greater the injury, the greater the pain that is experienced by the individual. Pain was thought to result in direct tissue damage to the body. This model also held that pain is either physical or psychological in nature.

Modern models of pain integrate the biological, cognitive, emotional, behavioral, and social aspects of this phenomenon. Studies have shown that many factors may have an influence on pain perception and that this is the result of not only physiological aspects but cognitive and behavioral aspects as well. The modern models tend to view pain as a sensory and emotional experience that is not necessarily the result of tissue injury or a nerve signal.

Pain Scales

Pain has been recognized as a vital sign that should be properly monitored and alleviated. Pain management has been acknowledged to result in faster recovery, improved quality of life, and increased productivity of the individual. Healthcare providers seek to diagnose pain according to its onset, duration, character, location, and severity as well as the symptoms associated with it. The diagnosis of pain requires that the healthcare

provider examine a patient's symptoms, condition, and medical history. Pain assessment generally also examines a person's pain threshold in addition to his or her pain tolerance.

A number of pain scales have been developed to assess and evaluate an individual's level of pain, using various methods. For example, the McGill Pain Questionnaire is a tool that is often used to gain a verbal assessment of an individual's pain. The Brief Pain Inventory uses an interview technique to evaluate how pain affects an individual's daily functioning. Scales have also been created to rate an individual's pain, such as the Numeric Rating Scale and the Faces Pain Scale, that assess the intensity of pain as minimal to severe as well as monitoring a person's pain over time to evaluate if the individual responds to treatment. These pain scales also enable medical researchers to compare the results between groups of patients.

Kenneth L. Vaux

See also Acute and Chronic Diseases; Complementary and Alternative Medicine; Disability; Measurement in Health Services Research; Patient-Reported Outcomes; Quality of Healthcare; Quality of Life, Health Related

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- American Pain Society (APS): <http://www.ampainsoc.org>
- NIH Pain Consortium: <http://painconsortium.nih.gov>

PAN AMERICAN HEALTH ORGANIZATION (PAHO)

The Pan American Health Organization (PAHO) is the world's oldest international public health agency, and it is recognized as part of the United Nations system. PAHO has over a century of experience in working to improve the health and living standards of the people in the Americas. PAHO serves as the World Health Organization's (WHO) Regional Office of the Americas as well as the health organization of the Inter-American system. The agency has scientific and technical experts located at its headquarters in Washington, D.C., at its 27 country offices, and at its 9 scientific centers that work on health issues of primary concern to countries in Latin America and the Caribbean. The mission of PAHO is to strengthen local and national health systems and to improve the health of the people of the Americas through various joint collaborative efforts.

History

PAHO was established in 1902 to work with all countries in the Americas to raise the living standards and improve the health of their peoples. PAHO comprises member states that include all 35 countries (Antigua and Barbuda, Argentina, Bahamas, Barbados, Belize, Bolivia, Brazil, Canada, Chile, Colombia, Costa Rica, Cuba, Dominica, Dominican Republic, Ecuador, El Salvador, Grenada, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Saint Lucia, St. Vincent and the Grenadines, St. Kitts and Nevis, Suriname, Trinidad and Tobago, the United States, Uruguay, and Venezuela) in the Americas, with the addition of Puerto Rico as an associate member; participating states (France, the Netherlands, and the United Kingdom and Northern Ireland); and observer states (Spain and Portugal). PAHO's policies are set through its governing bodies. To advance its organizational mission, PAHO maintains collaborative efforts with Ministries of Health, universities, nongovernmental organizations (NGOs), governmental agencies, and others.

PAHO works to promote primary healthcare strategies in communities by increasing access to care and encouraging the efficient use of limited resources. The organization has been involved in assisting countries to combat reemerging infectious diseases such as cholera, tuberculosis, and dengue as well as emerging infectious diseases such as AIDS, through technical assistance, support, and work with NGOs. In addition, PAHO works to prevent the spread of chronic diseases that have begun to afflict populations in the developing countries of the Americas. The work of PAHO is supported by the contributions of its member governments as well as outside funding that aids special programs.

The PAHO focuses its efforts to target the most vulnerable members of society, including women, children, workers, the elderly, refugees, and displaced persons as well as to address equity issues in terms of access to care. The Pan American approach of having countries cooperate and work together toward shared goals has been an essential part of PAHO's history. The agency has been pivotal in initiating multinational collaborative health ventures in Central America, the Caribbean, the Andean Region, and the Southern Cone. The height of political collaboration resulted when the American heads of state accepted the "Health Technology Linking the Americas" initiative at the Summit in Santiago.

The eradication of smallpox from the Americas in 1973, with worldwide eradication 5 years later, has been one of PAHO's great successes. Another major effort, begun in 1985, to eradicate polio, was accomplished in September, 1994, when the Americas were declared to be polio free by the International Commission. PAHO is close to its goal of eliminating measles from the Americas and continues to introduce vaccines that are available against other diseases, including the Haemophilus influenza B vaccine to prevent meningitis and respiratory infections. PAHO continues to assist countries to secure the necessary resources to provide for the immunization and treatment of all vaccine-preventable diseases. The agency is also working to reduce morbidity and mortality from diarrheal diseases, including cholera, through case management and oral rehydration therapy, as well as to ensure the diagnosis and treatment of respiratory infections.

PAHO'S Work

PAHO distributes scientific and technical information that is made available through its publications, Web site, libraries, and documentation centers. It also provides technical assistance in the various areas of public health, in addition to organizing disaster relief coordination and emergency preparedness programs.

PAHO supports initiatives to control malaria, Chagas' disease, urban rabies, leprosy, and other diseases affecting people in the Americas. Additionally, it is collaborating with others to address nutritional deficiencies, including iodine and vitamin A deficiencies, as well as protein-energy malnutrition. The organization has also been working with countries to cope with health problems that have resulted from industrial development, including cardiovascular disease, cancer, and substance abuse. It also conducts projects on behalf of other United Nations agencies, international organizations, government agencies, and foundations.

PAHO works to enhance the health sector capacity in countries to address their priority areas. The agency is involved in training health professionals as well as increasing the capacity of national training institutions. PAHO is also working to further integrate women into society and improve the health status of women.

Priority Areas

An important priority area of PAHO is to reduce infant mortality and prevent an additional 25,000 infant deaths a year through the use of the Integrated Management of Childhood Illness strategy. The agency is also marshalling the necessary resources to train healthcare workers to evaluate the health status of children brought in to a health post or clinic as well as to diagnose, treat, and prevent disease.

Recognizing the health consequences and costs associated with tobacco use, the governing bodies of the Pan American Health Organization have directed it to curtail the use of tobacco. Additionally, with an emphasis on equity, a continued priority area of PAHO includes adequate sanitation, improvement of drinking water supplies, and increased access to healthcare for the poor. Furthermore, advocacy efforts have been directed

to reduce gender inequity and address the unique health problems of women.

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See also Access to Healthcare; Emergency Preparedness; Emerging Diseases; Infectious Diseases; International Health Systems; Public Health; Tobacco Use; World Health Organization (WHO)

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- World Health Organization (WHO): <http://www.who.int>

PATIENT-CENTERED CARE

Patient-centered care is care that is sensitive and responsive toward the individual needs, preferences, and values of the patient. The national Institute of Medicine (IOM) named patient-centered care as one of the six domains of health-care quality. Additionally, the importance of this

concept is starting to be recognized by the medical community. Studies have shown that patient-centered care results not only in increased patient satisfaction but also in improved patient medical outcomes. Licensing and regulatory bodies, as well as board certification agencies, have begun to include patient-centered criteria in their approval processes for medical professionals. Despite these various efforts, many physicians and other health-care providers are still not currently practicing patient-centered care.

Overview

The following highlights an example of patient-centered care. A patient presents with throbbing pain in his right leg in a hospital emergency department. The nurses and physicians deal with him gently, as they seek his medical history, and discern the source of his problem. This kind of calm, tender treatment of the ill and infirm is at the core of patient-centered care.

Although patient-centered care is starting to be recognized as an important aspect in healthcare, it has been slow to be fully embraced. National surveys conducted by the Commonwealth Fund found that about 1 in 5 adults has difficulty in communicating with his or her physician. And about 1 in 10 adults has been treated disrespectfully during a healthcare visit. There have also been reports of patients who receive conflicting information from their healthcare providers or of the results of medical tests and medical records not being available at the time of the patient's visit.

As a result of these shortcomings, patients are being asked to become active partners in their healthcare. Through a patient-centered health system, there would be increased patient-provider communication and greater availability of educational materials and tools to help patients make more informed decisions. A patient-centered health system would increase access to care and include timely appointments and off-hour services. The increased use of information technology would be essential to achieve this model.

A patient-centered health system would also include greater continuity of care among primary care and specialist physicians, post-hospital-discharge follow-up, and disease management. Making sure that patients have a medical home is

key to developing a patient-centered care model. Furthermore, providing patients with pertinent information on the quality of providers as well as regular feedback would contribute to an improved healthcare system.

According to a study in 2006, physicians say that they favor patient-centered care, but only 22% of physicians actually incorporate these standards into their daily practices. Some practices of patient-centered care, such as same-day appointments, have been integrated; however, other aspects related to care coordination, team-based care, and information systems have yet to be widely implemented. Some other key findings from this study were that physicians in group medical practices of 50 or more are more likely to adopt components of patient-centered care than solo practitioners and that, although 73% of primary-care physicians think that team-based care results in better care decisions, 33% think that the team process makes care cumbersome, and 21% think that it increases the likelihood of medical errors. Only 2% of primary-care physicians are paid for e-mail correspondence with patients. Additionally, 87% of primary-care physicians think that improved teamwork or communication among providers would be effective in improving the quality of patient care.

Patient Feedback

There is reported to be a significant gap between physicians' endorsement of the concept of patient-centered care and their actual adoption of practices to implement it. For example, only 36% of primary-care physicians and 20% of specialists indicated that they receive data based on patient satisfaction surveys, but more than one-quarter indicated that they were actually rewarded based on patient survey data.

Furthermore, physicians report that there is an array of barriers to their adoption of patient-centered care practices, including lack of training, knowledge, and costs. It has been suggested that different incentives might help to facilitate increased adoption of patient-centered practices. If physicians are given the correct tools and practice environment, and also develop a partnership with their patients, then a patient-centered system may be better able to take shape.

Improved Medical Outcomes

Some experts say that patient-centered care needs to be presented differently to physicians. Rather than being an abstract concept, patient-centered care should be shown as something that affects medical outcomes. Demonstrating this will increase the number of physicians who adopt the practice.

For example, health services researchers note that nearly 6% of hospital admissions are caused by patients failing to take prescribed medications (also known as *noncompliance*). The word *compliance* connotes that the patient should do exactly what the physician orders; however, physicians know that an authoritarian approach does not necessarily translate to the best medical outcomes. By being more patient-centered, physicians would treat patients as partners by involving them in planning their healthcare and encouraging them to take responsibility for their health. Experts note that a growing body of research, published during the past three decades, has shown that the nature of the physician-patient conversation has a direct bearing on compliance.

Studies have also shown that patients are more likely to take their medications, abstain from poor nutrition, and show up for appointments on time when allowed to help set their treatment plans. This ultimately promotes patient compliance and leads to better quality of care. Physicians generally underestimate the number of patients who refuse to comply with their regimens. It has been estimated that between 40% and 50% of diabetic patients do not abide by their medication regimens. Similarly, the figure for hypertensive patients is about 40%.

In addition to better medical outcomes, a patient-centered system leads to decreased costs. It has been noted that it is much less expensive to promote compliance than to hospitalize patients because they have not taken their blood pressure pills. One study found that at least half of the patients who were given a prescription did not receive the full benefit because they did not take it, they did not take the right dosage, or they stopped taking it prematurely.

Provider-Patient Communication

Communication with patients is the key to patient-centered care. There are five simple steps that

physicians and other healthcare providers can take to communicate more effectively with patients.

First, the patient must determine whether he or she agrees on what the health problem actually is with the physician. A patient with a headache may believe that it is caused by a sinus infection, which should be treated with an antibiotic. However, the physician may believe that it is a migraine and needs a different medicine. If this difference is not resolved, the patient may not take the product as prescribed.

Second, once the patient and physician agree, attainable treatment goals must be set. If a hypertensive patient has a diastolic blood pressure of 120 mmHg, the physician may not want to try to bring it down below 90 mmHg immediately. Rather, the physician may suggest 110 mmHg as a short-term goal. Once this has been reached, the physician can use that to motivate the patient to reduce it even more.

Third, there is generally more than one option to treat a given condition. Physicians should review a reasonable range of alternative treatment options and discuss the benefits and possible side effects of each one in terms that the patient understands.

Fourth, the patient and physician must decide on a feasible course of treatment. They can choose the medical option that makes the most sense. For example, a patient with hypertension may have just remarried and may not want a low-cost drug that could reduce sexual drive. Therefore, he or she may opt for a high-cost product with no sexual side effects. Dosage frequency requires a similar discussion.

Last, the physician should test the patient's knowledge. He or she should ask patients to repeat what they have been told about their illness and treatment plan. It is also important for patients to demonstrate any techniques they have been taught, such as injecting insulin or using a peak flowmeter. For example, some physicians have diabetic patients practice needle sticks in their office using an orange.

There are also questions at the end of a patient visit that allow physicians to screen for likely non-compliance. An example of this is, "On a scale of 1 to 10, with 10 being the highest, how important do you think it is for you to do the things we've been talking about?" By gathering this type of information, the physician may discover that a

diabetic patient is convinced that his or her disease is fatal and that any treatment would be in vain. An answer like that will inform the physician that there is a need to further discuss the disease and its management.

Additionally, a physician should probe by asking, "On a scale of 1 to 10, how confident are you that you can adhere to this treatment regimen?" A heavy smoker who is absolutely convinced that he or she needs to give up cigarettes may have a confidence level of 1 that this can be accomplished. However, by examining further, there may be signs that additional counseling and support are needed to monitor the patient closely during the withdrawal stages.

Gene J. Koprowski

See also Continuum of Care; Disease Management; Health Communication; Outcomes Movement; Primary Care; Primary-Care Physicians; Quality of Healthcare; Satisfaction Surveys

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 Institute for Healthcare Improvement (IHI):
<http://www.ihl.org>

PATIENT DUMPING

Patient dumping—the denial of examination and stabilization services for persons with medical emergencies for reasons unrelated to medical need—constitutes a long-standing issue in U.S. health law and policy. It is relatively common to see the concept of patient dumping expressed strictly in relation to financial motive. In fact, financial motive is not a prerequisite to either the concept of dumping or to legal liability. Legal violation can result even without financial motive, for example, if an HIV-positive patient with a medical emergency is turned away because staff physicians refuse to treat him or her. (In such a situation, a hospital may be in violation not only of antidumping laws but also of federal and state civil rights laws that protect persons with disabilities.)

Nature and Extent

No one really knows the magnitude of patient dumping in the nation. Every so often, a headline-making incident occurs. In 2006, for example, a Los Angeles hospital was criminally charged with discharging a medically unstable homeless woman from her hospital bed—and still in her gown and slippers—to a skid-row neighborhood. But quantitative analyses do not exist, in part because there is no good way to know how many people may be turned away from hospitals with no service at all. Thus, reliable statistics are lacking regarding the number of persons who may be turned away without treatment or who may be prematurely discharged from hospitals in an unstable condition for reasons unrelated to medical need. Relatively precise standards outline the duties of hospitals where emergency care is concerned, and to estimate the dumping problem accurately, incidents would need to be aligned with an array of terms and standards that, in certain aspects, also turn on medical judgment, an added confounder. The federal government does not publicly report on the number of emergency department examinations that fail to result in a finding of an emergency

medical condition, nor are there reports on the number of persons with emergency conditions who are discharged or transferred in an unstable state.

That patient dumping is a real problem is not a matter of serious debate; indeed, the legal framework for patient antidumping standards evolved from the reports of a series of spectacular incidents. Antidumping laws are controversial, in part because of the high level of stress faced by hospital emergency departments. Between 1991 and 2003, hospital emergency department visits in the nation increased by 26%, reaching a 2003 level of about 114 million visits. Of the total number of emergency department visits, about one-third were considered to be nonurgent, meaning that about 38 million visits annually are for conditions that, on examination, may be considered nonemergent. Since antidumping duties commence with the obligation to examine, the fact that many exams reveal nonemergent conditions is actually somewhat tangential. Furthermore, emergency department statistics are predicated on individuals who become registered emergency department patients. How many individuals are actually dumped—that is, turned away without any exam or diverted away from a hospital while in an ambulance—must be factored into the equation when thinking about the true reach of antidumping laws.

The Antidumping Legal Framework

The No-Duty Principle

The starting point for understanding the consequential nature of antidumping obligation is the common law principle of “no duty.” Under the common law, that is, under the long-standing principles of judicial law on which much of the U.S. legal system rests, healthcare professionals and other healthcare providers have no duty to furnish care. That is, hospitals and physicians are not considered “places of public accommodation” and thus have no legal duty to furnish care to any person they do not wish to serve. Once a provider-patient relationship is established, then, of course, healthcare providers do have a legal duty to act in a reasonable way. But this duty to behave in a reasonably professional manner does not trigger until a provider actually agrees to enter into a physician-patient relationship.

For example, a physician has no duty to come to the aid of a person suffering a medical emergency (in all jurisdictions, physicians who do provide emergency aid are covered by Good Samaritan laws that protect against all but liability for gross negligence or willful or wanton misconduct). Under common law, hospitals had no duty to treat emergencies.

Evolution of the No-Duty Principle

By the middle of the 20th century, a combination of changing emergency care technology and fundamental shifts in social values led to a fundamental legal rethinking of the no-duty principle by courts and state legislatures, at least where hospital emergency department care was concerned. (To this day, physicians have no legal duty of care.) The rise of the modern hospital, with its technologically advanced and lifesaving emergency department services, was perceived as fueling community expectations of care. The community expectation was further fueled by the considerable community support received by hospitals in the form of insurance payments, direct government support, and nonprofit tax exemptions. Indeed, the Hospital Survey and Construction Act of 1946 (more commonly known as the Hill-Burton Act) represented a national commitment to hospital construction, one that, over time, would come to be understood as creating emergency-care duties of its own.

In sum, by the middle of the 20th century, the nation's hospitals ceased to exist merely as workplaces for physicians. As complex and essential medical-care entities in their own right, hospitals were burgeoning, in great part because of a community commitment to their growth. Furthermore, this national commitment of resources took a massive leap forward with the enactment of Medicare and Medicaid in 1965.

At heart, the law is simply a highly formalized reflection of prevailing social values and beliefs. Thus, as hospitals changed as social institutions, so did their relationship to the law in many respects, including the law as it related to emergency hospital care. Similarly, as market values have come to dominate the hospital industry in recent years, the legal obligations of hospitals in response to emergency cases also have undergone a certain amount of relaxation.

The earliest patient-dumping law came from judicial decisions involving persons who died or were severely injured as a result of the denial of care. Among the principles applied to hospitals by the courts as a means of finding liability for turning people away without care under their "no duty" were the common law concepts of "detrimental reliance," "public accommodation," and "legal undertaking." A detrimental reliance claim was one in which the injured person or decedent's estate argued that the very presence of the hospital emergency department created a legal duty because the community came to rely on its presence in times of emergency; thus, the hospital could not hold itself out as the place to come for emergency care—and indeed, establish a record of furnishing such care—and then select its customers.

A public accommodation claim rested on the notion that, like innkeepers and transportation systems (which are prohibited at common law from refusing paying customers), hospitals with emergency department capacity were obligated to serve the public, even if the public could not pay at the point of service. The public accommodation theory rested on the life and death role played by inns and common carriers during the Middle Ages; thus, as hospitals came to occupy a lifesaving role in society, they came to represent a similar social good.

An undertaking claim rested on the notion that a hospital that turned someone away had actually begun to undertake care. Thus, in one celebrated court case, a hospital was found liable for essentially abandoning a patient when personnel ordered the family of a dying man to place him on an empty stretcher in the emergency department and then ignored him until he died.

In the concept of emergency care, two specific types of duties became evident from these early cases. The first was a duty to examine individuals who come to a hospital seeking care, that is, a duty to undertake care through an initial examination, regardless of factors unrelated to need. The second duty was a duty to stabilize emergency conditions in persons whose examinations revealed an emergency (typically defined as a condition that would lead to death). From the perspective of the totality of healthcare, the duty was quite narrow: Hospitals were not expected to cure or rehabilitate persons with emergencies, merely examine and stabilize them. But from the perspective of the no-duty

principle, the departure was profound, particularly because it served to establish the physician–patient relationship on which professional and corporate liability rest. Furthermore, depending on the nature of the emergency, the examination and stabilization could consume considerable resources and be quite lengthy.

The Hill-Burton Act and State Anti-Patient Dumping Statutes

As judicial law shifted, so did statutory and regulatory law. By the early 1980s a number of state legislatures had enacted emergency-care statutes that conditioned licensure on not only maintenance of hospital emergency departments but also the provision of screening and stabilization services to persons with emergency medical conditions, as defined under state law.

In addition, the Hill-Burton Act became the subject of extensive litigation surrounding the meaning of its statutory “community service obligation.” This obligation, a companion to the act’s better-known “uncompensated care” obligation, required all federally funded hospitals to provide assurances that they would serve their communities. In revised regulations issued in 1979, the U.S. Department of Health and Human Services (HHS) had interpreted the law as requiring the provision of certain emergency-related screening and stabilization services, without regard to whether individuals could pay for the care at the point of service.

The Hill-Burton regulations reached thousands of facilities built with Hill-Burton funding. But by the end of the 1970s, funding had ceased; even during its operational period, Hill-Burton excluded for-profit facilities. Thus, hospitals built over the past generation have received no Hill-Burton funds.

The Emergency Medical Treatment and Active Labor Act

Enacted in 1986, the Emergency Medical Treatment and Active Labor Act (EMTALA) was a response to the U.S. Congress’ concern over the impact of the new Medicare prospective payment system (PPS) on hospital access among indigent and uninsured patients. Its enactment followed a series of highly publicized incidents of patient dumping. In its structure and terms, EMTALA is

unique in U.S. law. Indeed, EMTALA offers the only example in which U.S. law creates a legally enforceable individual right to healthcare.

EMTALA applies to all Medicare-participating hospitals that operate an emergency department, thus pushing its reach well beyond the limits of previous federal laws applicable only to hospitals built with certain forms of public financing. It obligates a covered hospital to provide an appropriate medical examination to any person who comes to the hospital’s emergency department.

It is difficult to overstate the extent to which EMTALA departs from traditional U.S. health policy, given the no-duty principle described above. In short, EMTALA creates an affirmative duty of emergency care on the part of Medicare-participating hospitals with emergency departments, thereby overriding the right of covered hospitals and their staff to select the patients they will serve. This emergency duty of care principle, as noted, has evolved over decades, but EMTALA expands and clarifies the duty in ways not previously seen in law.

At the same time, EMTALA has real limits. EMTALA alone does not compel a hospital to maintain an emergency department (state licensure laws, laws governing the conditions of participation for Medicare hospitals, and accreditation standards might, of course). Nor does EMTALA mandate that hospital emergency departments meet certain staffing and equipment standards (again, accreditation, licensure, and Medicare conditions of participation standards might set performance levels). What EMTALA does require is the undertaking of emergency care in a fair and non-discriminatory fashion.

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See also Access to Healthcare; Emergency Medical Services (EMS); Emergency Medical Treatment and Active Labor Act (EMTALA); Hospital Emergency Departments; Hospitals; Patient Transfers; Public Policy; Uninsured Individuals

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PATIENT-REPORTED OUTCOMES (PRO)

In clinical and translational outcomes research, the success of a patient's medical intervention or treatment has traditionally been assessed and documented by a physician or other clinician. Direct observation of response to an intervention is limited to objective measures. An outside observer cannot always measure outcomes of illness, treatment, or health promotion that minimize physical and emotional decline or loss of independence. Interventions affecting an individual's wellness, particularly in chronic disease progression, may have benefits beyond what can be objectively studied, including the preservation of functioning, pain relief, mood enhancement, and overall improvements in quality of life and well-being. With respect to more subjective outcomes, including quality of life, functioning, and symptom reduction, tools that have been validated and deemed sensitive are required to measure the impact of disease and illness from the afflicted individual's perspective. These measures are termed *patient-reported outcomes* (PRO).

Measurement of patient-reported outcomes provides valuable insight into health and illness beyond traditional efficacy or effectiveness research. In contrast to self-evident outcomes of illness such

as survival, patient-reported outcomes represent the patient's perspective on the impact of disease and its treatment on his or her everyday functioning and well-being. Instruments, typically questionnaires, can be an important measure of generic quality of life or functional status. Alternatively, they may be specific to disease, treatment, or symptom. Regardless, an instrument must be grounded in clinical and psychometric theory, be representative of domains relevant to what it attempts to measure, and have been demonstrated as valid, reliable, sensitive, and specific.

Guidance Document

Patient-reported outcomes have been defined as a measurement of any aspect of a patient's health status that comes directly from the patient (i.e., without the interpretation of the patient's responses by a physician or anyone else). Following its European counterparts, the U.S. Food and Drug Administration (FDA) released its guidance document for incorporating PRO into clinical research in 2006. This document outlines three key aspects of patient-reported outcomes that make it advantageous to include instruments in clinical and outcomes research.

1. *Some Treatment Effects Are Known Only to the Patients*

For some interventions, resulting success or failure can only be elucidated by querying the patient or subject. For example, level of anxiety and anxiety relief are the fundamental measures in understanding the benefit of cognitive behavioral therapy for generalized anxiety disorder. Also, pain intensity and pain relief are nearly exclusively subjective. There are little or no observable or physical measures that can be used to examine potential benefit related to treatment.

2. *Patients Provide a Unique Perspective on Treatment Effectiveness*

Patient-reported outcome measures can reflect what is important to a patient in terms of symptom relief, functioning, and quality of life. Thus, PRO can incorporate patient expectations related to their care. This becomes important when

clinically measurable differences related to an intervention (e.g., those quantified by a laboratory test) do not always translate into a perceivable change in health or wellness status. A widely cited example is that clinically meaningful improvements in lung function as measured by forced expiratory volume (FEV1) may not correlate well with improvements in asthma-related symptoms and their impact on a patient's ability to perform daily activities. Furthermore, significant improvements in clinically observable parameters may be correlated with a significantly negative impact on a patient's subjective response to treatment, particularly if the treatment intervention is associated with bothersome or frequent untoward side effects.

3. Formal Assessment May Be More Reliable Than Informal Interview

Obtaining information from patients on symptoms and symptom relief is not new. Clinicians informally ask questions such as, "Do you get short of breath when walking up a flight of stairs?" or "Does your pain interfere with your ability to get out of bed?" However, efforts to capture and analyze subjective answers to questions such as these are prone to inconsistency and measurement error in the absence of validated instruments. There is general agreement that scientific methods for assessing subjective outcomes (e.g., psychometrics and utility measurement) are well developed and can serve as the cornerstone for patient-reported outcomes assessment. Using existing methodology to systematically and formally gather information from patients about their symptoms and the impact of those symptoms on function is the cornerstone of PRO.

Instruments completed by patients directly measure perceived treatment response. Data captured in this manner are likely to be more reliable than those obtained through indirect third-party measurements because they are not affected by inter-rater inconsistency. Use of a well-constructed instrument is also valuable in detecting change in reported outcomes over time, particularly in progressive disease. Change in functioning may be gradual, and an instrument sensitive to this change can be useful in determining longitudinal impact on decline or improvement.

Classification of PRO Measurements

Patient-reported outcomes broadly encompass several types of instruments. These include symptom scales as well as instruments that measure health-related quality of life, functional status (e.g., ability to conduct activities of daily living), satisfaction with treatment, compliance with the intervention, and medication adherence and persistence. They may be disease specific, such as the Asthma Control Test (ACT) or the Function Living Index: Cancer (FLIC); they may be treatment specific, such as the Satisfaction With Antipsychotic Medication (SWAM) scale, or they may measure the overall status of a condition such as instruments that measure the presence or absence of depression or angina.

Alternatively to these very specific applications, patient-reported outcomes instruments may also be generic and applicable across a wide variety of disease categories. Most measurements of physical functioning and activities of daily living fall into the category of generic measures. One of the earliest and perhaps the most widely known and cited generic measure was created by John E. Ware and colleagues as an outgrowth of the Medical Outcomes Study (MOS). Known as the Short Form 36 (SF-36), this instrument encompasses 36 questions representing the domains of (1) physical functioning, (2) role functioning, (3) bodily pain, (4) general health perception, (5) vitality, (6) social functioning, (7) role-emotional functioning, and (8) mental health. Item responses within these eight domains are reported as two summary measures—physical and mental health. Generic measures such as the SF-36 have been validated within numerous disease states. Depending on the disease state, the SF-36 has been used to identify both differences in overall outcome between intervention groups and also changes within intervention groups over time.

In addition to comparing patient-reported quality of life outcomes within an individual disease state, generic measures have proven valuable for comparing health perceptions across disease states. Instruments such as the SF-36 or, more commonly, the Health Utilities Index (HUI) have been validated extensively and specifically to compare quality of life across diseases. To accomplish this comparison, results from generic measures are

converted to a 0 to 1 scale, with 1 representing perfect health and functioning and 0 representing the state nearest to death. To illustrate comparison of utilities, individuals with advanced metastatic medulloblastoma brain tumor may have a health utility of 0.31, as compared with 0.58 for an individual who is undergoing cardiac bypass surgery and 0.99 for someone without symptoms taking a cholesterol-lowering agent for hyperlipidemia. These “utilities” are used to calculate quality-adjusted life years (QALYs), which are used for policy decisions surrounding drug formulary placement and treatment reimbursement, particularly in Europe, Canada, and Australia.

Methodological Considerations in Developing PRO

The mechanism with which patient-reported outcome data is captured typically includes a questionnaire. Questionnaires may be self-administered, with a subject filling out a form with pen and paper or electronically via a computer. They may be clinician administered via a healthcare worker, social scientist, or other trained individual reading questions or through conducting a formal, structured interview either in person or telephonically. Methods available for questionnaire development generally are grounded in rigorous psychometric theory. The merit of patient-reported outcome questionnaires is determined based on three key properties. First, outcomes must be conceptually defined and be based on the most current understanding of domains of functioning and aspects of life quality relative to what is being assessed. Disease- or treatment-based instruments must also be framed within the context of a thorough review of the medical or psychiatric literature. Second, aspects of functioning, quality of life, or symptomatology must be suitably operationalized through the questionnaire. This includes using phraseology and terminology that can be understood and interpreted by the respondent. The time period that the subject is required to recall in order to respond to the question must be relevant to the health state studied but short enough to allow accurate reporting of experience. Scaling must be representative of the respondent's experience. Scaling typically measures intensity of the perceived health aspect (e.g., occurring none of

the time, some of the time, or all the time), as well as the intensity (e.g., mild, moderate, or severe) of the experience. The respondent burden, the time required to complete the instrument, must be minimized to promote willingness to complete the instrument and to facilitate the quality of the responses. The remaining, and perhaps most often overlooked, property of instrument development includes field testing to determine reliability, validity, and responsiveness (i.e., minimally detectable change). Creating and validating instruments typically encompasses creating a draft with input from leaders in the field of study, piloting the instrument in individuals afflicted with the condition of interest, interviewing pilot respondents to identify potential problems with the instrument, and finally, performing a full-scale validation study comparing responses to the instrument with recognized gold standards, where available (concurrent validity). Minimum requirements for validation of instruments includes demonstration of reliability, construct validity, responsiveness over time, internal consistency, and test-retest reliability. Measurements of validity and reliability typically make use of Cronbach's alpha coefficient and correlation or kappa coefficients. Agreement of .70 or greater is typically accepted for group comparisons. When investigator administered, a coefficient of .80 is typically acceptable to establish interrater reliability.

Other considerations in validation include that instruments should be able to discriminate between subgroups of individuals based on severity. Also, translation of instruments validated in one language should undergo linguistic validation during translation to alternate languages. Similarly, tools validated using one administration mode (e.g., self-administered) should be validated in an alternate mode (e.g., telephone interview administration) prior to incorporation into translational research.

In recent years, interest in incorporating patient-reported outcomes into clinical trials designed to meet regulatory requirements in the approval process for marketing of medicines has led to an explosion of instrument development. This development is geared toward developing tools sensitive and specific to changes in PRO related to specific pharmaceutical products. In response, regulators and harmonization groups have begun to adopt standards by which PRO measures are developed.

These measurement characteristics are grounded in solid theory and are now widely accepted. The ultimate objective is to develop and implement an instrument that is accurate and validated of the intended domains.

Alicia Shillington

See also Activities of Daily Living (ADL); Measurement in Health Services Research; Outcomes Movement; Quality-Adjusted Life Years (QALYs); Quality Indicators; Quality of Healthcare; Short-Form Health Surveys (SF-36, -12, -8); Structure-Process-Outcome Quality Measures

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- Patient-Reported Outcomes Measurement Information System (PROMIS): <http://www.nihpromis.org/default.aspx>
- Patient-Reported Outcome and Quality of Life Instruments Database (ProQolid): <http://www.qolid.org>
- U.S. Food and Drug Administration (FDA): <http://www.fda.gov>

PATIENT SAFETY

The issue of patient safety has only gained national attention during the past decade, primarily due to the recognition that much hospital morbidity and mortality is due to medical errors. Many organizations and programs have been established to address patient safety. Most healthcare institutions have instituted patient safety measures, which are key to maintaining their accreditation and therefore to their remaining financially solvent.

Defining the Problem

Patient safety and medical errors are closely linked, and in discussing one it is often necessary to discuss the other. For this entry, patient safety is defined as freedom from accidental injury due to medical care or medical errors. *Medical error* is defined as the failure of a planned action to be completed as intended or the use of a wrong plan to achieve an aim, including problems in medical practice, products, procedures, and systems.

The term *patient safety* was first used in the name of a professional medical organization in 1984, with the establishment of the Anesthesia Patient Safety Foundation by the American Society of Anesthesiologists. Despite the recognition of patient safety issues in the field of anesthesia, the topic did not gain national attention until the late 1990s, solidified by the national Institute of Medicine (IOM) landmark report *To Err Is Human: Building a Safer Health System*, which was published in 2000. The report estimated that between 44,000 and 98,000 people die in the United States every year due to medical errors. It also estimated that the national cost of medical errors to hospitals was between \$17 and \$29 billion per year.

The IOM report cited commonly occurring errors, including adverse drug events and improper transfusions, surgical injuries and wrong-site surgery, suicides, restraint-related injuries or death, falls, burns, pressure ulcers, and mistaken patient identities. The report also cited an article in the *Quality Review Bulletin* (1993) that categorized medical errors broadly into diagnostic (e.g., error or delay in diagnosis, failure to employ tests, using outdated tests, and failure to act on results), treatment (error in performance or administration of treatment, avoidable delay in treatment, error in dose or method of using a drug, and inappropriate care), preventive (failure to provide prophylactic treatment and failure to monitor), or other (failure of communication and equipment failure) groups.

Following the IOM report, further studies were conducted to track medical errors and patient safety issues. A study published in the *Journal of the American Medical Association* in 2003 found that the greatest injury due to medical errors was postoperative sepsis leading to an excess length of hospital stay of 11 days, excess charges of \$57,727, and excess mortality of 22%.

A HealthGrades Quality Study, which was published in 2004 and investigated hospitalized Medicare patients between 2000 and 2002, found more than 1 million adverse events resulting in up to 195,000 accidental deaths per year. Based on the Agency for Healthcare Research and Quality's (AHRQ's) 20 evidence-based patient safety indicators, the study found that the three most common errors were failure to rescue (failure to diagnose and treat in time), decubitus ulcer, and postoperative sepsis. These three errors accounted for almost 60% of all patient safety incidents among the hospitalized Medicare patients, with an estimated excess annual cost of \$2.85 billion.

Addressing Medical Errors

The IOM report refuted the "bad apple" theory, which suggested that medical errors are due to specific faulty or inept practitioners; instead, it determined that errors are usually the result of faulty systems, processes, and conditions that lead people to make mistakes or fail to prevent them. Also, errors are not limited to actions but also include failure to act and avert preventable adverse outcomes.

To improve patient safety, the report recommended a four-tiered approach: (1) establish a national focus to create leadership, research, tools, and protocols to enhance the knowledge base about safety; (2) identify and learn from errors by developing a nationwide public mandatory reporting system and by encouraging healthcare organizations and practitioners to develop and participate in voluntary reporting systems; (3) raise performance standards and expectations for improvements in safety through the actions of oversight organizations, professional groups, and group purchasers of healthcare; and (4) implant safety systems in healthcare organizations to ensure safe practice at the delivery level.

Largely in response to the IOM report, the U.S. Congress allocated \$50 million to the federal AHRQ in 2000 to support efforts to improve patient safety and reduce medical errors. A follow-up report from the IOM in 2001 further advocated the rapid adoption of electronic clinical records, electronic medication ordering, and computer- and Internet-based information systems to

support clinical decisions to improve patient safety and reduce medical errors.

The development of evidence-based recommendations for specific medical conditions, termed *clinical practice guidelines* or *best practices*, has accelerated in the past few years. Also, the U.S. Congress passed the Patient Safety and Quality Improvement (PSQI) Act of 2005, establishing a database to improve patient safety by encouraging voluntary and confidential reporting of medical errors.

Public and Private Initiatives

Since the publication of the landmark IOM report in 2000, many government and private organizations have made patient safety a top healthcare priority. Government organizations with specific initiatives for patient safety include the AHRQ and the Centers for Medicare and Medicaid Services (CMS).

Private organizations concerned with patient safety include the American Society of Medication Safety Officers (ASMSO), Council on Graduate Medical Education (COGME), Institute for Healthcare Improvement (IHI), Institute for Safe Medication Practices (ISMP), Joint Commission, Leapfrog Group, National Academy of State Health Policy (NASHP), National Advisory Council on Nurse Education and Practice (NACNEP), National Patient Safety Foundation (NPSF), National Quality Forum (NQF), Safe Care Campaign, and the United States Pharmacopeia (USP).

Selected Patient Safety Organizations and Programs

The CMS currently has several demonstration projects underway, including a pay-for-performance program, which offers hospitals increased compensation for improvements in patient care coordination and the institution of quality measures. It also initiated a new disincentive rule in 2008, which stops hospitals from billing Medicare for any charges associated with eight serious preventable conditions. The eight conditions include (1) pressure ulcers, (2) urinary tract infections, (3) patient falls, (4) mediastinitis (an infection after heart surgery), (5) objects left in the patient's

bodies after surgery such as sponges, (6) incompatible blood transfusions, (7) air embolisms blocking blood flow, and (8) infections caused by leaving catheters in blood vessels and bladders too long.

The Joint Commission, which was established in 1951, is an independent, nonprofit organization that evaluates and accredits nearly 15,000 health-care organizations and programs in the nation. Most healthcare organizations seek accreditation to receive federal Medicare and Medicaid funds. Many of the Joint Commission's standards for organizations directly relate to patient safety, response to adverse events, and the prevention of accidental harm. During the past decade, the Joint Commission has established a number of programs addressing patient safety, including the National Patient Safety Goals and the Speak Up initiatives, which urge patients to take an active role in preventing medical errors. In 2005, it established an International Center for Patient Safety to collaborate with international patient safety organizations.

The Leapfrog Group, which was established in 2000, is a conglomeration of large U.S. corporations that agreed to base their purchase of health-care on principles that encouraged provider quality improvement and consumer involvement. It created the Leapfrog Hospital Rewards Program, which mandates specific quality practices such as computerized physician order entry, evidence-based hospital referral, and intensive-care unit (ICU) staffing by physicians experienced in critical-care medicine. Additionally, a Leapfrog Safe Practices Score was developed as a hospital quality ratings system to influence consumers' choices.

The NPSF is a nonprofit organization founded in 1996 by the American Medical Association (AMA), CNA HealthPro, and 3M. The foundation provides leadership training, research support, and education, and it publishes the *Journal of Patient Safety*, containing original articles and reviews on the subject.

The NQF is a nonprofit, membership organization established in 1999 to develop and implement a national strategy for healthcare quality measurement and reporting. The NQF has focused on several areas, including medical error rates, unnecessary procedures and undertreatment, and preventive care. In 2002, the NQF defined 27 events that should never occur within a healthcare facility. It

grouped the “never” events into six categories (officially called Serious Reportable Events): (1) surgical events (e.g., surgery being performed on the wrong patient), (2) product or device events (e.g., using contaminated drugs), (3) patient protection events (e.g., an infant discharged to the wrong person), (4) care management events (e.g., a medication error), (5) environmental events (e.g., electric shock or burn), and (6) criminal events (e.g., sexual assault of a patient).

Important Concepts

“First, do no harm” is an often-quoted mantra attributed to Hippocrates, the father of Western medicine. The implication is that medical professionals should try to help but at a minimum should do no additional harm. Many medical errors are the direct result of inappropriate actions such as administering the wrong dose of a medication or performing surgery on the wrong limb or patient.

Prevention is a key concept as well. Inaction is considered equally as culpable as performing the wrong action. Many medical “errors” are due to not addressing foreseeable adverse events. Examples include not instituting fall precautions (e.g., raising bedrails for patients at risk of falling out of bed), not washing hands properly (leading to transmission of hospital-acquired infections), and not giving anticoagulant medicine to prevent blood clots in bed-bound patients.

Evidence-based medicine is the idea of integrating available medical research into patient care. Many clinical practice guidelines have been established in recent years, which are consensus-based recommendations for physicians to apply to care of patients. These guidelines can help create consistent care based on the most up-to-date scientific data available.

To improve patient safety, medical errors need to be identified and studied to determine possible causes. Reporting of medical errors, including near-miss events, is paramount. A near-miss event is an unplanned event that did not result in injury, illness, or damage, but had the potential to do so. Reporting of near-miss events by observers is an established error reduction technique in other industries and has recently been applied to the healthcare sector.

Future Implications

Many medical errors have been attributed to poor handwriting, manual order entry, and nonstandard abbreviations that are misinterpreted. Electronic clinical records are a new technology that has the potential to reduce some of these errors, not only by eliminating illegibility but also by having default doses for medications and alerts for potential drug interactions or allergies. Electronic clinical records could also reduce errors by improving access to information and communication among providers.

As noted above, some organizations, including the CMS, have pilot programs which use a pay-for-performance system that includes financial incentives and disincentives relating to patient safety and the occurrence of “never” events identified by the NQF. This type of reimbursement is highly controversial. Proponents suggest that financial incentives will change behavior and encourage systems improvements. Others, primarily physician groups, argue that many complications occur despite following best practice guidelines (e.g., postoperative infections), and institutions and providers will be unfairly penalized, possibly leading to compromised patient safety if healthcare organizations are denied vital resources.

Legal reform is also seen as an area for intervention. Healthcare providers are often hesitant to report errors due to the threat of legal liability. U.S. Senators Hillary Rodham Clinton (D-NY) and Barack Obama (D-IL) jointly proposed the National Medical Error Disclosure and Compensation (MEDiC) Bill of 2005, which would create an Office of Patient Safety and Health Care Quality to administer the MEDiC program. The proposed program is designed to improve disclosure of medical errors, give physicians certain protections from liability, and help facilitate appropriate compensation for affected patients, with the overall aim of improving patient safety. The bill was referred to the Senate in September 2005 and subsequently to the Committee on Health, Education, Labor, and Pensions. Neither the MEDiC Bill nor any other recent legislation addressing medical malpractice reform has been passed by both houses of Congress, but this topic will likely resurface when a new administration

revisits the problems of healthcare costs and medical errors.

Stacey Chamberlain

See also Clinical Practice Guidelines; Evidence-Based Medicine (EBM); Joint Commission; Leapfrog Group; Medical Errors; National Quality Forum; Pay-for-Performance; Quality of Healthcare

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- Joint Commission: <http://www.jointcommission.org>
- Leapfrog Group: <http://www.leapfroggroup.org>
- National Quality Forum (NQF): <http://www.qualityforum.org>

PATIENT TRANSFERS

Patient transfers can be defined by the various methods (e.g., ground or air transport) and motives (e.g., transfer to another hospital because the patient does not have health insurance) for moving a patient from one location to another. A major classification of patient transfers is whether they are intrafacility or interfacility transfers. Intrafacility transfers are patient transfers within a given healthcare facility, either between departments or between other organizations within the healthcare facility. In contrast, interfacility transfers are patient transfers from one healthcare facility to another facility. Examples of interfacility transfers include the following: (a) hospital-to-hospital transfers, (b) clinic to hospital transfers, (c) hospital to rehabilitation facility transfers, and (d) hospital to long-term care facility transfers.

Challenges to the success of interfacility transfers include the qualifications of those delivering the care, the ability to meet the clinical needs of the patient, and the aptitude to maintain continuity of care. Due to the emergence of specialty medical systems such as cardiac centers and stroke centers, the ultimate destination of a patient is now often predicated on the patient's specific medical condition rather than the proximity of the nearest medical facility. This practice has created the need for enhanced measurement and guidelines and the evaluation of patient transfers to understand and track the different circumstances under which transfers take place.

Because of this change, the number of stakeholders involved in patient transfer protocols and instrumentations has increased and diversified over the past few years. Stakeholders include physicians at both the receiving and transferring facility, the medical staff of both institutions, the patient and the patient's family and caregivers, the third-party insurance groups, the health administration and legal staff of both facilities, and the transferring bodies such as the ambulance staff. Additional stakeholders include Emergency Medical Services (EMS) organizations and the National Highway Traffic Safety Administration (NHTSA) who enter into discussions to create EMS priority issues and

establish guidelines for the EMS organization's critical-care transport. This level of transport care is provided to patients whose indication requires an expert level of provider knowledge and skills, a setting with necessary equipment, and the ability to handle the challenge of the transport.

Reasons for Patient Transfers

The rationales for transferring patients include facility capacity issues, facility or physician specialty and competency, and limitations in levels of care offered. Hospitals are often plagued with issues of overcapacity and inability to properly house and care for incoming patients. Some healthcare institutions such as clinics and nursing homes may accept only a few payment options, thereby limiting the care they provide. Additionally, many patients are transferred because the initial admitting facility is unable to support the needs of the patient. For example, some of the highest frequencies of interfacility transfers occur among obstetrics and gynecology (e.g., high-risk pregnancies) and neurology (e.g., stroke) patients, who require specialized training not available at many healthcare facilities.

Issues

Problems with interfacility patient transfers can also be unrelated to medical care. Nonclinically related issues include redundant and unnecessary transports that create financial burdens in terms of both direct and indirect costs. Direct costs may include the expenses for transport and personnel, while the indirect costs may include the expenses related to increased patient morbidity, liability issues, and overcrowding in the emergency department. Patient-related issues include the time involved, the extent of morbidity and mortality associated with wait time, lack of care continuity and poor quality of care, patient privacy issues, and patient dumping. Patient dumping occurs when unexamined or unstable patients are transferred to another facility because of nonclinical reasons, as when the patient does not have health insurance and is likely not to be able to pay for his or her care.

Public Policy

The federal Emergency Medical Treatment and Active Labor Act (EMTALA) provides broad guidelines regarding the transfer of patients after they seek care in a hospital's emergency department. EMTALA, which was passed in 1986, was designed to prevent patient dumping. It mandates that hospitals that receive Medicare and Medicaid funds provide medical screening examinations of all emergency department patients, regardless of a patient's ability to pay. If critical medical conditions are identified, EMTALA requires the hospital to stabilize the patient before transferring him or her to another facility for care. The act addresses concerns of patient safety and the ability to receive medical care regardless of demographics and socioeconomic status.

Future Implications

As the result of EMTALA, many of the nation's hospitals are changing their patient transfer protocols. They are increasingly implementing centralized transfer centers to improve overall patient flows and to control incoming patients and facility capacity. These centralized transfer centers also promise to lower costs, save time, and protect the facilities against lawsuits.

Jillian R. O'Neill

See also Access to Healthcare; Emergency Medical Services (EMS); Emergency Medical Treatment and Active Labor Act (EMTALA); For-Profit Versus Not-For-Profit Healthcare; Hospitals; Patient Dumping; Uninsured Individuals

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Centers for Medicare and Medicaid Services (CMS):
<http://www.cms.hhs.gov>

Joint Commission: <http://www.jointcommission.org>

PAULY, MARK V.

Mark V. Pauly is one of America’s leading health economists. Although Pauly has conducted research in many areas of health economics, he is perhaps best known for his work on moral hazard. His classic 1968 study of the economics of moral hazard was the first to point out how health insurance may affect the behavior of the insured as well as those providing healthcare services to them. His work popularized the term.

Pauly is currently the Bendheim Professor in the Department of Health Care Systems at the Wharton School of the University of Pennsylvania. He also is professor of business and public policy and insurance and risk management at the Wharton School and professor of economics in the School of Arts and Sciences at the University of Pennsylvania. Before joining the Wharton School in 1983, he taught at Northwestern University for 16 years.

Born in 1941, Pauly earned a bachelor of arts degree in classical languages from Xavier University in 1963, a master’s degree in economics from the University of Delaware in 1965, and a doctorate in economics from the University of Virginia in 1967.

Over his long career, Pauly has studied the empirical and theoretical impact of health insurance coverage on preventive care, ambulatory care, and prescription drug use in managed care. He has investigated the various influences that determine the availability of health insurance coverage and, using cost-effectiveness analysis, determined the influences of medical care and health

practices on outcomes and costs. He also has studied and proposed ways to reduce the number of uninsured through the use of tax credits and ways to redesign the Medicare program.

Pauly is a prolific researcher and author. He has published many scholarly journal articles and books on various health economics topics. He is the coeditor-in-chief of the *International Journal of Health Care Finance and Economics* and the associate editor of the *Journal of Risk and Uncertainty*. He also serves on the editorial board of *Public Finance Quarterly*.

Pauly has received many awards and honors in recognition of his work. In 2007, he received the Distinguished Investigator Award from AcademyHealth and the John Eisenberg Excellence in Mentorship Award from the federal Agency for Healthcare Research and Quality (AHRQ). He is an elected member of the National Academy of Sciences, Institute of Medicine (IOM). He also is a member of the National Advisory Council for the AHRQ. He was the recipient of an investigator award in health policy research from the Robert Wood Johnson Foundation. And he previously served as a commissioner on the Physician Payment Review Commission (PPRC), which advised the U.S. Congress on Medicare physician payment.

He has consulted for national public policy and research centers such as the American Enterprise Institute for Public Policy Research (AEI), Mathematica Policy Research, and the Urban Institute; hospital associations, including the Greater New York Hospital Association; and pharmaceutical companies such as Amgen, Bayer, Glaxo, and Merck.

Pauly’s current interests include the economic analysis of healthcare reform, the understanding of the conceptual foundations for cost-benefit analysis of pharmaceutical drugs, and the economic incentives in managed care. His work will continue to assist health services researchers and policymakers to better understand the economics of healthcare in America.

Pritha Dasgupta

See also Health Economics; Health Insurance; Health Insurance Coverage; Medicare; Moral Hazard; National Health Insurance; Public Policy; Uninsured Individuals

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PAY-FOR-PERFORMANCE

The linkage of financial incentives to quality and performance is a relatively new concept in healthcare. Pay-for-performance is a way to reward healthcare providers for higher-quality healthcare. In most industries, lower costs are achieved through greater production efficiency, and financial rewards accrue to firms that produce high-quality products more efficiently. In contrast, most physicians and hospitals are paid the same regardless of the quality of the healthcare they provide, producing no financial incentives for quality and, in some cases, disincentives for quality.

In its 2001 report *Cross the Quality Chasm: A New Health System for the 21st Century*, the National Academy of Sciences, Institute of Medicine (IOM) drew attention to the poor quality of the nation's healthcare as well as factors contributing

to poor quality, including the structure of the present healthcare payment system. The IOM noted that, for certain types of clinical situations, healthcare payment arrangements may actually produce disincentives for quality care. For example, in general, patients cared for under fee-for-service reimbursement systems receive more services that are under the discretion of the provider. The incentives result in overuse of services without regard to efficiency; services of high cost that are technically complex tend to be rewarded over those that are labor and time intensive, such as counseling regarding self-care of diabetes or care coordination among subspecialists. High-technology, -volume, and -cost services are preferentially rewarded over low-technology, -volume, cost preventive healthcare services.

Under fee-for-service, this imbalance in incentives for high-technology, -volume, -cost services is further compounded. When providers invest in improving outcomes of chronic diseases (such as diabetes), their income may eventually drop, as patients with excellent control of their diabetes require fewer office visits and hospital stays in the longer term, resulting in fewer opportunities to bill for services.

Other payment methods do not reimburse for services provided but pay healthcare providers prospectively. These types of payment methods may also provide disincentives for quality. For example, capitation payment methods result in lower use of healthcare services overall and may result in underuse of essential services. Furthermore, while preventive care is more likely to be rewarded under capitation than it is under fee-for-service, when patients switch healthcare plans, investments in preventive care are less likely to result in financial savings for the payer who provided and made the up-front investments in such care.

In recognition of these issues, there are increasing numbers of programs in the United Kingdom and the United States that link payment to performance. In 2004, the United Kingdom's National Health Service (NHS) began a pay-for-performance initiative. General practitioners agreed to participate in a performance program encompassing 146 quality indicators reflecting clinical care for 10 chronic diseases, organization of care, and patient experience. In return, funding for primary care was increased 20% over previous levels, permitting

practices to invest in technology and staff. A startling 90% of general practitioners now use electronic prescribing, and general practitioners increased their income by \$40,000 through the program.

In the United States, given the disincentives for high quality healthcare that exist in current payment methods such as fee-for-service and capitation, the objectives of pay-for-performance include rapid performance improvement to address ongoing quality deficits, innovation, structural changes in care delivery, and, ultimately, better outcomes of care. A number of issues are critical to the success of pay-for-performance programs in achieving these objectives and improving the quality of healthcare.

Measuring Quality

The methods used for defining and measuring quality are the fundamental building blocks of any pay-for-performance program and are critical to the success of a program in meeting its objectives. If measures of quality do not have a sound theoretical and methodological foundation, healthcare providers are not being rewarded for the behaviors that are desired and are even perhaps inadvertently being rewarded for behaviors that are undesirable. For example, if improving the numbers of patients who quit using tobacco is the desired outcome, but documentation of tobacco cessation advice is the rewarded measure, healthcare providers may merely document smoking cessation advice, without supplying any further tools to aid smokers in quitting.

Significant limitations exist in current clinical information systems in use by healthcare providers, which are often not designed to collect data valid for quality assessment. If the data sources for creating performance measures are not universally available, accurate, and reliable, healthcare providers become suspicious that their performance is not being accurately assessed. Furthermore, if the cohort of patients eligible for the measures does not reflect the actual panel of patients, healthcare providers participating in a pay-for-performance program may be inadvertently penalized for care provided (or not provided) by others.

Risk adjustment is also essential, where appropriate. Measures of quality that do not make

appropriate risk adjustments create incentives for providers to avoid treating the sickest patients or penalize healthcare providers who care for disproportionate numbers of disadvantaged patients, who may not be able to afford their medications or comply with a treatment plan.

Chronic medical conditions are the leading cause of morbidity and mortality in the United States, and treatment of patients with these conditions consumes more than three fourths of all healthcare expenditures. Yet despite the resources devoted to the treatment of chronic conditions, chronically ill patients receive only half of the appropriate recommended care overall. Thus, many pay-for-performance programs have focused on increasing the provision of guideline-recommended care.

The effect of common, chronic, coexisting (or comorbid) conditions on measures of the quality of healthcare and patient ratings of their care is of concern to healthcare providers. Coexisting conditions complicate treatment plans and patient compliance. Some studies show that patients with chronic diseases are less likely to receive treatment for unrelated disorders or to undergo preventive healthcare services, but others show that patients with coexisting conditions are more likely to receive higher quality care. However, some studies have used a simple count of conditions as a crude marker of complexity or accessed only a limited range of conditions, possibly obscuring important relationships between types of conditions. For example, in patients with diabetes, treatment of hypertension is “concordant” with the goals of treatment for ischemic heart disease, whereas the treatment of arthritis is not, or, in other words, is “discordant.” Therefore, treatment of arthritis might reduce the time available during a visit to address care for diabetes, whereas treatment of comorbid hypertension might not.

Healthcare providers are also concerned that with the increasing numbers of comorbid conditions, patient ratings of their care may suffer. This is because “high quality” care may come with a burden of large numbers of medications and healthcare use that lowers the satisfaction of patients overall. An evaluation of clinical practice guideline adherence found that a hypothetical older adult with five common comorbidities would be prescribed at least 12 medications. Also, because evidenced-based

guidelines focus on single-disease processes and fail to account for patients with multiple comorbidities, the potential risks and benefits of such therapy, particularly in elderly patients, are unclear.

Process Versus Outcome Measures of Quality

In designing performance measures for incentive programs, several issues should be noted. First, the best process-of-care measures are those for which there is evidence that better performance leads to better health outcomes. Second, it is important to note that process-of-care measures may be more sensitive to quality differences than are measures of health outcomes, because a poor health outcome does not necessarily occur every time there is a quality problem.

It could be argued that, other things being equal, individual physician-level process-based incentives will create stronger incentives for improvement in processes over which the physician can exert direct control. In turn, such individual physician incentives may produce better health outcomes (assuming that the processes receiving incentives are systematically related to improved health outcomes over time). Therefore, combining outcome-based (e.g., tobacco quit rates) with process-based incentives (e.g., documentation of smoking cessation advice) may produce even greater quality improvement overall than process measures alone, by encouraging providers to balance process with attention to results. This approach may avoid the pitfalls of process-of-care measures alone that encourage gaming the system while avoiding the disadvantage of basing incentives solely on outcomes that may be relatively rare or difficult to achieve and somewhat beyond the control of the provider. Thus, a combined approach capitalizes on the advantages and complementary nature of both types of quality-of-care measures. However, the exact combination of process-based and outcome-based incentives that could be expected to produce the highest quality of healthcare is unknown.

Careful attention to quality measurement issues is important in averting healthcare provider opposition to such programs. A scientifically sound approach to quality measurement may also alleviate concerns that pay-for-performance is primarily a cost-cutting rather than a quality improvement tool.

Effectiveness

Ideally, studies of pay-for-performance would be multi-institutional, large-scale investigations of important and common medical conditions. Ideal studies include concurrent control groups to ensure that investigators can clearly infer associations between pay-for-performance and changes in performance. However, many pay-for-performance projects are implemented in an uncontrolled fashion, making it unclear whether the benefits are truly due to the financial incentives. Concurrent controls are essential to learn whether other temporal changes in the healthcare environment are resulting in improvements in the quality care, rather than a pay-for-performance program. Quality-of-care measures should be based on high-quality evidence and accepted guidelines, so as to minimize dispute over the evidence base for rewarded measures. Outcomes of care should be assessed. Unintended effects of the incentive program on performance measures that were not financially rewarded should also be assessed. To ensure face validity, clinical data should be collected consistently. However, empirical studies of the relationship between explicit financial incentives designed to improve a measure of healthcare quality and a quantitative measure of healthcare quality are rare in the literature. Rigorous research designs and methodology are necessary to determine whether performance-based payment arrangements result in meaningful quality improvements and are cost-effective. Studies meeting all the above criteria are surprisingly rare.

Despite the limitations of the literature, the available studies in general show some significant effects of pay-for-performance in improving the quality of healthcare. In studies of preventive care, with rewards to individual physicians, investigators have documented improvements in performance ranging from 8% to 19%. Rewards to provider groups generally had effect sizes of less than 10%.

Design of Financial Incentive Reward Programs

Designing financial incentives is a complex process involving decisions about whether providers should be in a “tournament” (competitive) style

program, whether the recipient of the incentive should consist of an individual healthcare provider or a group of healthcare providers (including clerical support staff, nurses, and pharmacists), the amount of the reward, how frequently the reward should be given, and whether the reward should include some sort of nonfinancial component, such as audit and feedback or a public recognition program. Choices in any of these categories have advantages and disadvantages. As part of this decision-making process, policymakers should consider whether their goal is improving performance at the lower end of the spectrum versus maintaining best performance, or both.

Payment may be made according to relative performance (i.e., the participant's overall percentile ranking) or absolute performance (i.e., strictly according to performance relative to the quality standard). Payment may also be made on what is termed a "Pay as You Perform" schedule, so that each instance of the behavior is rewarded. Theoretical arguments for and against these designs from the fields of economics, social psychology, cognitive psychology, industrial/organizational psychology, and other behavioral disciplines can be made. The approach that works best in healthcare is an open question.

One could anticipate that with group- or practice-team-level incentives, individual physicians would not capture the full returns on their individual effort to improve the quality of their care. The potential for some physicians to "free-ride" on the efforts of others may lead them to reduce their individual efforts. However, the problem with rewarding individuals, but not the organization or group, is that the provision of the required institutional cooperation may not be present. Thus, theory suggests the potential for group-level incentives to support organizational and team-based efforts to improve the quality of healthcare. Some evidence regarding teams and groups exists from studies evaluating the chronic-care model. These suggest that multidisciplinary teams produce better patient outcomes. Group- or system-level incentives may provide the impetus to create infrastructure changes or to promote cooperation that is absent from traditional practice.

Attributing care to a provider or a group of providers can be challenging, particularly for patients who suffer from complex, chronic diseases,

such as coexisting diabetes and chronic heart failure. Patients frequently interact with more than one provider, and treatment requires consultation with multiple subspecialists. Enhancing care coordination is essential to improving quality of care. How to identify providers who act in a coordinating role and then reward them for successfully accomplishing this role is essential to improving care for patients with chronic, complex conditions. The American College of Physicians (ACP) has proposed the concept of The Advanced Medical Home as a patient-centered, physician-guided model of healthcare to address some of these communication and coordination issues.

Most programs to date have consisted of positive rewards, rather than reduction in payments. However, this is changing. In the United States, the Centers for Medicare and Medicaid Services (CMS) has proposed eliminating payments for care that results in injury or death. As of October 2008, payments would be reduced for "never events" as defined by the National Quality Forum, such as hospital-acquired infections. And other healthcare payers are exploring similar plans.

Apart from the structure of the payment plan, the size of the bonus is almost certainly important. Possible explanations for the lack of effect or small effect in some previous studies may include the small size of the bonus. Similarly, when multiple insurers pay providers, the incentive may affect too few patients, effectively diluting the size of the incentive. On the other hand, a bonus that is perceived to be too large may produce negative feelings regarding a pay-for-performance program. Some critics have wondered whether pay-for-performance programs crowd out intrinsic motivation and negatively affect professionalism. Larger bonuses are more likely to contribute to these perceptions.

The last design issue to consider is the "end-of-year" compensation, which may not influence physician behavior as much as a concurrent fee or intermittent bonus. This is because lack of awareness of the intervention and infrequent performance feedback appear to be significant potential barriers to the effectiveness of incentives.

Regardless of the choices made, incentives require very careful design and attention to possible unintended consequences. A few studies have shown that documentation, rather than actual use of the preventive service, was significantly improved

with a financial incentive. Obviously, the goal of the pay-for-performance program is to improve the quality of healthcare and not just documentation alone. Measures more likely to show evidence of unintended effects are those unrelated to reward measures, such as screening for cancer or treatment of pneumonia.

Unanswered Questions

Despite the wide adoption of pay-for-performance, research evidence of the effectiveness of pay-for-performance programs, particularly randomized trials, is very limited, and many questions remain unanswered. For example, what types of clinical conditions or healthcare services should be the target of financial incentives to improve quality—chronic diseases, acute care, and/or preventive care services? How effective (and cost-effective) are financial incentives for quality? What are the optimum magnitude, frequency, and duration of financial incentives for quality? Should insurers reward achievement of an absolute threshold of performance, improvement over baseline performance, or some combination of these? To whom should such incentives be directed—the patient, the healthcare provider, the provider group, or the hospital—or all of them? What types of quality measures should be rewarded—processes of care, health outcomes, or both? Are financial incentives for not providing inappropriate care (such as antibiotics for uncomplicated acute upper-respiratory illnesses) effective? What is the optimum “package” of nonfinancial interventions, if any, to include with financial incentives for quality—e.g., audit and feedback, recognition, clinical reminders, academic detailing, and/or information technology support? Can insurers expect that the effect of financial incentives will persist after they are stopped? Because any effective intervention will have some unanticipated effects, will important patient care activities that are not rewarded financially be neglected? Thus, despite the great enthusiasm about the potential for aligning financial incentives with high-quality healthcare, there are a number of fundamental unanswered questions about their optimal design, effectiveness, and implementation.

Rigorous research, including randomized, controlled trials and observational studies with

concurrent control groups, is needed to guide implementation of explicit financial incentives for healthcare quality and to assess their cost-effectiveness. Much more research is needed to ensure that the nation’s healthcare financing systems are effectively designed to encourage and promote the highest possible quality of healthcare for the nation’s population.

Laura A. Petersen

See also Centers for Medicare and Medicaid Services (CMS); Medicare; National Quality Forum (NQF); Payment Mechanisms; Quality of Healthcare; United Kingdom’s National Health Service (NHS)

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- National Academy of Sciences, Institute of Medicine (IOM): <http://www.iom.edu>

National Committee for Quality Assurance (NCQA):
<http://www.ncqa.org>
 National Quality Forum (NQF):
<http://www.qualityforum.org>

PAYMENT MECHANISMS

Payment mechanisms are the methods by which healthcare providers are reimbursed for the goods and services they provide. Payment mechanisms include those made by the patient, or *first-party payments*; health insurer, or *third-party payments*; and those payments that are assumed by the healthcare provider, or *second-party payments*. Each payment mechanism has inherent economic incentives that affect utilization.

Third-Party Payment Mechanisms

Third-party payers (i.e., insurance companies, managed-care organizations, and the government) use a number of mechanisms to pay healthcare providers for the cost of services delivered to their insured patients. Both public payers (e.g., Medicare and Medicaid) and private payers (e.g., Blue Cross and Blue Shield and other insurance plans) have similar types of payment mechanisms available. These payment mechanisms include fee-for-service, fee schedule, per diem, per stay, and capitation payments. Often, a payer uses multiple payment mechanisms within a particular insurance product. For example, physician outpatient care may be reimbursed using a fee schedule and hospital inpatient care may be reimbursed on a per-stay basis.

Fee-for-Service

A fee-for-service payment mechanism reimburses healthcare providers on a per-unit basis or for each service provided. The fee may be based on the actual charges (i.e., the amount charged by the provider) or based on a schedule that lists the dollar amount to be reimbursed for each service. Under fee-for-service payment mechanisms, providers have the economic incentive to provide more services than necessary to increase revenue, since they are paid per unit. When fee-for-service payments are based on actual charges rather than

a predetermined fee schedule, providers can also increase revenue by increasing their charges.

Fee Schedules

Fee schedules are a particular type of fee-for-service payment mechanism that establishes either a maximum amount or actual amount of reimbursement for a particular service. If the fee schedule were used to establish maximum fees, the provider would receive the lesser of the amount charged and the predetermined amount in the fee schedule. In practice, providers almost always charge more than the fee schedule amount to ensure receipt of the full amount established in the fee schedule. Providers have the incentive to provide more services than necessary as a means of increasing revenue, but they have no influence on the amount reimbursed per service as long as their fees are set above the fee schedule amount.

The most common fee schedule in the United States is the National Physician Fee Schedule Relative Value System, which Medicare uses to reimburse physicians for services provided to Medicare beneficiaries. The system is based on the Resource-Based Relative Value Scale (RBRVS), which was developed by William Hsiao and his associates at Harvard University. Specifically, this fee schedule establishes relative value units for each Current Procedural Terminology (CPT) and Healthcare Common Procedure Coding System (HCPCS) code, and it then converts the relative value units to a dollar amount of reimbursement using a conversion factor that is revised annually. Many third-party payers use this system as the basis for determining their physician fee schedules by modifying the conversion factor that translates relative value units to dollars of reimbursement.

Per Diem

Per diem is a payment mechanism that reimburses healthcare providers per day of stay and establishes a set fee per day. Per diem is most commonly used by third-party payers for acute, long-term, skilled nursing and psychiatric hospital stays. Providers have the incentive to keep patients in the facility longer than necessary to increase reimbursement, but they have no influence on the price paid per day.

Per Stay

Third-party payers may also use payment mechanisms that make one payment for each episode of care, such as a hospitalization stay. Per stay payments solve the incentive problem inherent in per diem payments of treating patients for longer durations of time than necessary, since a flat payment per episode is made. Providers do have an incentive, however, to increase the number of times a patient is admitted to increase reimbursement.

Medicare's prospective payment system (PPS) is a payment mechanism that reimburses services on a fixed amount per episode of care for some types of services, such as acute inpatient hospital stays and home health care, while it uses per diem payments for other services, such as skilled nursing care. Acute-care hospitals are reimbursed for each inpatient case based on the Diagnosis Related Group (DRG) assigned to the case, with one payment for each hospital stay. DRGs were developed by John D. Thompson and Robert B. Fetter at Yale University. Specifically, the total payment includes a base DRG payment component plus adjustments if the hospital has a high proportion of low-income patients or is a teaching hospital or if the case is an outlier in terms of being a high-cost case. Home health care is reimbursed based on 60-day episodes of care, with a base payment plus adjustments for factors such as case-mix (i.e., severity of illness, clinical condition, and services required).

Capitation

Capitation is a payment mechanism that reimburses a physician, medical group practice, or hospital a fixed amount per patient for a fixed period of time. Often capitation payments are paid for each insured member assigned to a provider for each month, or a per-member per-month (PMPM) capitation payment. Capitation payments cover a predetermined set of services provided within the defined time period and may include primary and specialty-care physician services, other outpatient services, diagnostic and laboratory tests, and hospital stays. The provider assumes the risk of the healthcare costs for the defined population of patients, and therefore, has the incentive to provide efficient care.

First-Party Payment Mechanisms

Healthcare providers also receive payments directly from patients. Self-pay is a first-party payment mechanism and includes situations in which the patient is the only payer and those in which the patient is responsible for a portion of the payment with a third party responsible for a balance of the payment.

Self-Pay

Self-pay is the patient's out-of-pocket payment obligation. Self-pay as a payment mechanism includes two types of patients—those with no source of health insurance coverage who are responsible for the entire fee (i.e., uninsured self-pay), and those with a third-party source of health insurance coverage who must pay a portion of the fee out of pocket (i.e., insured self-pay). Payments for uninsured self-pay patients have historically been based on hospital or provider charges with no negotiated price discounts. Many hospitals have been criticized for charging patients with the least financial means the most for care, and many are revising their policies for uninsured self-pay patients.

Payments for insured self-pay patients are based on the negotiated rates established between the third-party payer and healthcare provider. Insured self-pay payment mechanisms include three main types of demand-side cost sharing, namely deductibles, coinsurance, and copayments. A deductible is the amount that an insured individual must pay out of pocket before the insurer will start to reimburse the providers for services, and the individual usually must pay the deductible each year. From an insurance perspective, coinsurance is a general term that refers to the amount of a medical bill that the insured individual is responsible for out of pocket, which could be stated as a percentage of the total amount billed or as a flat dollar amount. In healthcare, coinsurance is commonly used to refer specifically to the proportion of the negotiated medical fees that the insured individual is responsible for (e.g., 20% coinsurance), with the insurer paying the remaining proportion of the fees. A copayment refers to the flat dollar amount of the negotiated medical fees that the insured individual must pay (e.g., \$20 copayment), with the insurer paying the remaining dollar amount of the

fees. The dollar amount paid out of pocket with coinsurance may vary for each visit, but the dollar amount for a copayment remains constant.

These demand-side payment mechanisms may work together in a single episode of care. For example, suppose an individual has health insurance coverage with a \$500 deductible and a 20% coinsurance once the deductible is met. At the beginning of the year, the individual receives an MRI scan. This individual's out-of-pocket expenses would be \$540 (\$500 deductible + \$40 coinsurance (20% × \$200)), while the insurer's portion would be \$160 (\$700 – \$540). Instead, if the individual has a \$500 deductible with a \$20 copayment, the individual's out-of-pocket expense would be \$520, while the insurer would pay \$180.

Provider Internal Payment Mechanisms

Hospitals, physicians, and other healthcare providers do not collect payments from all patients—either because of a decision to provide services as charity care to a patient without the financial resources to pay or because of a failure to collect payment from the patient or third-party payer. Both charity care and bad debt are classified as uncompensated care.

Charity Care

For patients without the income (or assets, in some cases) to pay for needed services, healthcare providers may render the care as charity care. Charity care includes services that are provided but for which the provider does not expect a payment. The provider does not bill the patient or insurer nor does the provider pursue collection of payment from an external source.

Bad Debt

Bad debt includes payments that are expected to be collected but are not collected from either the patient or a third-party payer. Providers attempt to collect these payments but are ultimately unsuccessful. Bad debt is an expense to providers.

Future Implications

Healthcare payment mechanisms have become increasingly diverse and complex over time. Patients undergoing the same procedure at the

same hospital often use different payment mechanisms, or combination of payment mechanisms, and pay different amounts for the same services.

Even with healthcare reforms that would expand coverage to the currently uninsured population, the U.S. healthcare system is likely to continue relying on multiple sources of coverage, which will further fuel the complex web of payment mechanisms. While nations with a single-payer system have inherently simplified payment mechanisms, many nations may consider an increase in the individual's out-of-pocket responsibilities to control their own spiraling healthcare costs.

The largest change in the United States is likely to occur with respect to the balance of payments made by the individual compared with the insurer. Consumer-driven health plans are increasing the individual patient's cost-sharing obligations as a mechanism to control costs. This shift is likely to precipitate a change in how hospitals, physicians, and other healthcare providers collect first-party payments. While copayments for outpatient visits are routinely collected at the time of service, deductibles and coinsurance amounts for hospitalizations are more likely to be billed retrospectively. These payments are often collected after treatment because providers often cannot *ex ante* calculate the cost of treatment. As the size of first-party payments increases from hundreds to thousands of dollars, providers will have a greater incentive to collect them up front to guarantee payment. At face value, this change seems relatively minute; however, it could also lead to an increase in the number of potential patients denied services until they can make payment, to prevent a surge in bad debt.

Tricia J. Johnson and Michael Morgenstern

See also Capitation; Charity Care; Diagnosis Related Groups (DRGs); Fee-for-Service; Healthcare Financial Management; Prospective Payment; Resource-Based Relative Value Scale (RBRVS); Uncompensated Healthcare

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Medicare Payment Advisory Commission (MedPAC):

<http://www.medpac.gov>

PEW CHARITABLE TRUSTS

The Pew Charitable Trusts is the single recipient of seven charitable funds initiated by the children of Joseph N. Pew, the creator of Sun Oil Company, and his wife, Mary Anderson Pew. The four founders of the Pew Charitable Trusts were Joseph N. Pew, Jr., J. Howard Pew, Mary Ethel Pew, and Mabel Pew Myrin. They established the Trusts in 1948 as a means of honoring their parents. The central aim of the Trusts is to donate to the public and add to its general health and welfare and thereby strengthen the nation's communities. Since its establishment, the Pew Charitable Trusts has stayed robust, encompassing several national organizations, while keeping its pledge to businesses and groups within the Philadelphia area.

Based in Philadelphia, with an office in Washington, D.C., the Pew Charitable Trusts provides organizations and citizens with fact-based research and practical solutions for changing issues. It investigates a large number of topics, including arts and culture, children and youth, computers and the Internet, education, environment, health, Hispanics in America, media and journalism,

public opinion, and religion and public life. Specifically in the health area, it funds a number of centers and projects, including the Pennsylvania Medicaid Policy Center, the Genetics and Public Policy Center, and the Prescription Drug Project. In 2007, the Trusts spent a total of \$248 million on its multitude of centers and projects.

Changing Political Views

Joseph N. Pew's political views were right of center, as were those of his heirs. In the beginning, the J. Howard Pew Freedom Trust felt that its goal was educating the American people regarding the bureaucratic morass in Washington and how important the free market was for freedom. For instance, Pew thought that Roosevelt and his New Deal were nothing more than a hoax designed to turn Americans into automatons doing exactly what Washington wanted. For many years, the Pew Charitable Trusts primarily funded conservative activities centered in Philadelphia. Initially, the recipients comprised organizations such as cancer research institutes, museums, and various universities (especially those that were historically Black). The conservative leaning of the Trusts changed when Thomas Langfitt, who was president from 1987 to 1994, and his hand-picked successor, Rebecca Rimel, shifted the Trusts' emphasis to a more liberal stance. Both Langfitt and Rimel thought that the views espoused by Pew and his heirs were outdated and that, thus, a new direction was needed.

According to Rimel, one central theme undergirding the Pew Charitable Trusts is to help politicians and policymakers in Washington make decisions that would lead to positive change for each American. As a result, the Trusts uses some of America's greatest scholars, scientists, and philosophers to envision and initiate sensible solutions to urgent public problems. Even though the Trusts now has a more international focus, great emphasis is still placed on the citizens and culture of Philadelphia.

Pew Projects

In 1999, a new era for the Trusts began when the Pew Internet and American Life Project was created. This project scrutinizes the societal and community impact of the Internet. Other projects

include the Pew Research Center for the People and the Press (previously called the Times Mirror Center for the People and the Press). The center measures the changing opinions and mores of the American population. Each month, it conducts at least one major national opinion poll.

Another Trusts program is the Pew Global Attitudes Project, which conducts a series of worldwide opinion polls on a wide variety of topics. Over the years, it has conducted more than 150,000 interviews in 54 countries. In 2007, in conjunction with the Kaiser Family Foundation it conducted a global health survey that included 47 countries.

In 2001, the Trusts established the Pew Hispanic Center. Its primary goal focuses on the improvement and awareness of the diverse U.S. Hispanic populations. In addition, it seeks to record Latinos' increasing influence in the nation and to enlighten policy discussions regarding the nation's largest minority population.

The Pew Forum on Religion and Public Life sponsors an in-depth appreciation of questions at the junction of religious and public affairs. Its goal is to offer appropriate, impartial information to government leaders, journalists, analysts, and various national organizations. The forum never takes sides regarding policy and/or legislation, priding itself on being a nonpartisan entity.

Since 1999, the Pew Charitable Trusts has supported Stateline.org, an online news resource that covers state politics and policy through original reporting and by collecting news stories. Its goal is to strengthen and enrich America's political news agencies by offering data about the daily political activities taking place in each of the 50 states. Stateline.org considers itself to be an unbiased and impartial news journal; thus, the information contained therein is apolitical. Each week, approximately 20,000 viewers peruse the Web site. Stateline.org also publishes an annual *State of the States Report*, and it sponsors professional development conferences and workshops for the new media.

The Pew Charitable Trusts also funds the Pew Research Center, which operates as a self-regulating, apolitical organization. One activity of the center is to support the Pew Biomedical Scholars Program. This program provides financial assistance to talented early- and mid-career scientists who are investigating fundamental and medical areas

regarding human health. Scholars are given financial support (in the range of \$240,000 for 48 months) and are encouraged to be commercial and original in their research endeavors.

Cary Stacy Smith and Li-Ching Hung

See also Access to Healthcare; Health; Kaiser Family Foundation; Medicaid; Public Health; Public Policy; State-Based Health Insurance Initiatives; Vulnerable Populations

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PHARMACEUTICAL INDUSTRY

The pharmaceutical or drug industry historically has been one of the most innovative and profitable business sectors in the United States. Recent developments, however, portend major changes in the nation's pharmaceutical industry. Growing regulatory oversight, rising consumer distrust over advertising claims, drug safety concerns, increased cost-containment initiatives by government and private third-party payers, mandated health technology assessments to determine coverage and reimbursement policies, patent expirations of top-selling products, and the implementation of the Medicare Part D drug benefit have influenced changes in the industry's practices and strategies. This entry describes the

global sales and market share of the pharmaceutical industry, the different classifications within the industry, and the future outlook for the industry in light of the recent developments.

Global Pharmaceutical Sales

Global pharmaceutical sales grew by 7% in 2006, totaling more than \$643 billion (all data reported in U.S. dollars) in sales, according to industry estimates by IMS Health. This marked the third straight year of single-digit revenue growth for the pharmaceutical industry, after 5 years of double-digit increases from 1999 to 2003. The worldwide pharmaceutical market is dominated by the United States, with 44% of the world's market share, followed by Europe, with 28%, Japan, 10%, Asia Pacific, 7%, Latin America, 5%, the Middle East and Africa, 3%, and Canada, 3%. The largest European markets are France, Germany, Italy, the United Kingdom, and Spain. The Asia Pacific region includes fast-growing pharmaceutical companies, located in India and China, which mainly produce generic versions of drug products. Brazil is the largest market in Latin America.

Classification of the Pharmaceutical Industry

The pharmaceutical industry, or *pharma*, includes three primary sectors: (1) the traditional research-intensive pharmaceutical industry, (2) the research-intensive biopharmaceutical industry, and (3) the generic pharmaceutical industry. These sectors, however, are increasingly becoming blurred because of strategic company acquisitions, mergers, licensing agreements, and other business practices. For example, most traditional research-intensive pharmaceutical companies manufacture or license generic versions of their original products. The traditional research-intensive industry is attempting to gain market share and position in the biopharmaceutical industry. And the generic pharmaceutical industry is lobbying for legislation to facilitate the approval of *biogenerics* (i.e., similar versions of biotech pharmaceutical products).

Traditional Pharmaceutical Industry

The traditional research-intensive pharmaceutical industry is also known as the “brand-name”

or “innovator” pharmaceutical industry. The largest companies in this sector are often referred to as “Big Pharma.” They are represented by the trade association, Pharmaceutical Research and Manufactures of America (PhRMA). This sector focuses on the discovery, development, and production of new chemical entities and new biologic entities. These multibillion dollar corporations, however, are not limited solely to drug products or vaccine sales. Many of these corporations include other healthcare-related products, such as nutrition products, dietary supplements, diagnostics, medical devices, and other consumer products.

Relative rankings of the world's top pharmaceutical companies change yearly due to sales, patent expirations, mergers, acquisitions, and other practices. Based on 2007 rankings (compiled from Fortune 500 lists), 12 pharmaceutical corporations accounted for 60% of the total global pharmaceutical sales. The leading companies—based on sales, headquarters country, revenue, and profit (as a percentage of revenues)—were (1) Johnson & Johnson (U.S.), \$53.3 billion, 20.7%; (2) Pfizer (U.S.), \$52.4 billion, 36.9%; (3) GlaxoSmithKline (U.K.), \$42.7 billion, 23.2%; (4) Novartis (Switzerland), \$37 billion, 19.4%; (5) Sanofi-Aventis (France), \$37 billion, 13.6%; (6) Roche Group (Switzerland), \$34.7 billion, 18.1%; (7) AstraZeneca (U.K.), \$26.5 billion, 22.8%; (8) Merck & Co. (U.S.), \$22.6 billion, 19.6%; (9) Abbott Laboratories (U.S.), \$22.5 billion, 7.6%; (10) Wyeth (U.S.), \$20.4 billion, 20.6%; (11) Bristol-Myers Squibb (U.S.), \$17.9 billion, 8.8%; and (12) Eli Lilly (U.S.), \$15.7 billion, 17%.

Seven of the top pharmaceutical companies are American-based, and the five other top companies are headquartered in Europe. Depending on the year, other leading research-based pharmaceutical companies include Bayer (Germany), Boehringer Ingelheim (Germany), Schering-Plough (U.S.), Baxter International (U.S.), Takeda Pharmaceuticals (Japan), Procter & Gamble (U.S.), Astella Pharma (Japan), and others.

The median profit margin for the leading pharmaceutical companies was 19.5%, which is well above the median of 4% to 5% for most other industries. Median profit margins for the pharmaceutical industry have been about 17% to 18% since 2002 (with a slight dip to 14% in 2003). Industry profits increased in the United States due in part to

the passage of the Medicare Part D prescription drug benefit, which the industry helped pass.

The pharmaceutical industry asserts that its profits are in line with those of other major industries in consideration of its need for a reasonable return on its investment and adequate revenue to encourage risk and innovation in the business of drug discovery. Critics counter that it is difficult to consider such a routinely profitable industry as being risky.

The research-based pharmaceutical industry strongly supports innovative drug research, swift development and approval of drug products demonstrated to be safe and effective, strong intellectual property and patent protection, and access to medicines in an open, competitive market. It also supports federal legislation that would limit liability (e.g., limits on punitive damages and on damage awards) for drug manufacturers. On the other hand, it opposes restrictive drug formularies, prior authorization policies for prescription drug coverage, limits on prescription reimbursement, price controls, and retail-level prescription drug importation from foreign sources.

The U.S. Food and Drug Administration (FDA) is the federal agency that reviews drug products for approval in America, while patents on drug products (and related chemical compounds, processes, and other intellectual property) are granted by the U.S. Patent and Trademark Office. Patents can be granted anywhere along the development lifeline of a drug compound or product. Patents are granted for a period of 20 years from the date of filing, before patent term restoration activities and court challenges. The PhRMA states that due to lost patent time during the protracted drug approval process (estimated at 11 to 12 years by the FDA and up to 15 years by the pharmaceutical industry), the effective patent life of prescription drugs in the United States is only about 11 or 12 years, as compared with more than 18 years for nondrug products. The FDA can grant exclusive marketing rights, or exclusivity, for certain time periods (ranging from 6 months to 7 years) to help promote a balance between innovation in new chemical entities and generic competition.

Biopharmaceutical Industry

The research-based biopharmaceutical industry is the newest sector and is also referred to as the

“pharmaceutical biotechnology industry,” or “biopharma.” Its products are usually termed *biotech pharmaceuticals* or *biological medicines*. Biotech pharmaceuticals are medicines derived from living cells and proteins, the so-called large molecules. In comparison, the traditional research-based pharmaceutical industry discovers and produces drug products based primarily on small-molecule chemical substances. Examples of biopharmaceuticals include monoclonal antibodies, protein cell cultures, protein microbials, and bioengineered hormones. Biopharmaceuticals are used to treat a variety of medical conditions, though most current products are marketed as specialty medications indicated for cancers, anemia, heart disease, rheumatoid arthritis, and less prevalent diseases such as ankylosing spondylitis and Crohn’s disease. A large percentage of research and development expenses (25–50% of revenue) is invested by the biopharma industry as compared with the traditional research-intensive pharmaceutical industry (which averages about 18% of revenue).

The U.S. market for biotech pharmaceuticals was \$35 billion in 2006, a 17% increase in growth from 2005, which was about two times the rate of the traditional research-intensive pharmaceutical industry. Biotech pharmaceuticals accounted for 12% of total prescription sales, though the high costs for some of these products can make them prohibitively expensive. For example, treatment with Genentech’s Avastin (bevacizumab)—indicated for certain types of lung cancer, advanced breast cancer, or metastatic colorectal cancer—can cost \$100,000 per patient per year.

The top 10 biopharmaceutical companies, based on reported 2006 revenues, were (1) Amgen (\$14.3 billion), (2) Genentech (\$7.6 billion), (3) Novo Nordisk (\$6.5 billion), (4) Genzyme (\$3.2 billion), (5) Gilead Sciences (\$3 billion), (6) UCB Group (\$2.7 billion), (7) Biogen Idec (\$2.7 billion), (8) Serono (\$2.5 billion), (9) MedImmune (\$1.2 billion), and (10) Millennium (\$220 million). Eight of these companies are based in the United States. The exceptions are Novo Nordisk (Denmark) and UCB Group (Belgium).

Financial positions, relative rankings, and ownership can change quickly, especially in the more volatile biopharmaceutical sector. For example, Amgen’s profits of almost \$3 billion dropped by 19.7% from the levels achieved in 2005. Gilead

Sciences and Genzyme also experienced substantial profit decreases during a 1-year period. The eighth-ranked biopharmaceutical company—Serono—was acquired by Merck KGaA in 2006 and is now Merck Serono (known as EMD Serono, Inc., in the United States and Canada because Germany-based Merck KGaA is a different company from the U.S.-based Merck & Co., which has the rights to the name in North America). Similarly, AstraZeneca purchased MedImmune in 2007.

The biopharmaceutical industry has a similar product approval process to that of other pharmaceutical products. However, the approval time for a biopharmaceutical ranges between 7 and 12 years from development to approval. The development and manufacture of biologic medicines is more complex and expensive than production of small-molecule chemical entities, which is one of the reasons for their high costs. Because biologics are produced in living cells, it would be very difficult for other manufacturers to duplicate the process exactly in attempts to make generic versions of biopharmaceuticals. Thus, biosimilars may be therapeutically equivalent, rather than chemically equivalent with original products. The FDA is in the early stages of creating regulatory procedures for the review and approval of biogenerics or biosimilars, which are “generic” (or, more aptly named “similar”) versions of the innovator biotech pharmaceuticals. However, it is likely to be years before that process is completed.

The major biotechnology trade association is the Biotechnology Industry Organization (BIO), and its multidisciplinary membership includes more than 1,100 biotech companies, universities, research organizations, and affiliates. In addition to biotech pharmaceutical firms, an increasing number of PhRMA companies are branching into pharmaceutical biotechnology because of the rapid growth of the industry and the lack of current processes to enable generic competition. From 2005 to 2007, Big Pharma companies spent \$76 billion to acquire biotech companies. For example, Novartis, Wyeth, Abbot, and Eli Lilly have invested hundreds of millions of dollars each in the formation of in-house units for the development and manufacture of biotech pharmaceuticals and the building of new manufacturing facilities. Other Big Pharma companies have acquired smaller biotech firms to expand their pipelines.

The biopharmaceutical industry generally espouses similar position statements as the traditional research-intensive pharmaceutical companies with respect to support of market-based pricing for medicines, support of tax incentives to encourage investment in biotech-derived medicines, opposition to price controls for biotech drugs, and opposition to restrictive reimbursement programs. Similar to Big Pharma, the biotech pharmaceutical industry is using late life-cycle strategies to expand its product line and to extend the market life of its products, such as the second-generation anemia drug, EPO Aranesp (darbepoetin alfa), which is manufactured by Amgen. One area where the position of the biopharmaceutical industry differs from those of the traditional research-intensive pharmacy companies is with respect to policies on separate reimbursement mechanisms for drugs and biologicals.

Generic Pharmaceutical Industry

A generic drug product is defined as a product that is bioequivalent to a referenced innovator (brand name) drug product and is identical in active chemical ingredient, strength, dosage form, route of administration, quality, performance characteristics, safety, and treatment indication. Multisource generics are available for about three-quarters of drug products approved by the FDA. The generic pharmaceutical industry experienced a 22% growth in sales from 2005 to 2006. Nationally, 63% of prescriptions dispensed in the United States in 2006 were generic products, though generics accounted for only 20% of prescription drug sales. Over the past 20 years, the sustained growth in use of generic drug products has been promoted as a cost-saving measure by managed-care organizations, private health insurance companies, state Medicaid and other government programs, pharmacy benefit management companies, and others.

The pharmaceutical industry differentiates between unbranded generics and branded generics. Following approval of an abbreviated new drug application (ANDA) by the FDA, unbranded generics are manufactured by pharmaceutical companies unaffiliated (for that product) with the innovator company. The ANDA (and equivalent) process does not require the applicant firm to repeat the expensive preclinical and clinical research for the drug

ingredients and dosage forms that were approved by the FDA for the application of the innovator company. Rather, the generic product must demonstrate bioequivalence. The median ANDA approval time in 2006 was 16.6 months. Branded generics (called “authorized generics” by the industry) are generic versions of the innovator product that are manufactured by the innovator pharmaceutical industry sponsor and/or otherwise produced and distributed by one of its licensed partners. Branded generics are not required to undergo an abbreviated FDA approval process because the innovator company is selling the same product previously approved under a brand name. In 2006, the top pharmaceutical companies for unbranded generic drug products (accounting for 54% of prescription dispensed and 10% of U.S. sales) were Teva Pharmaceuticals, Novartis (Sandoz division), Mylan Laboratories, Watson Pharmaceuticals, Pfizer (Greenstone division), Apotex Corporation, Par Pharmaceuticals, Mallinckrodt, Barr Labs, Boehringer Ingelheim, Actavis US, Qualitest Products, and Hospira, Inc.

The main generic pharmaceutical industry trade association is the Generic Pharmaceutical Association (GPhA). The association states that the generic manufacturers provide consumers with safe, effective, quality drug products at lower costs. Generic drugs are estimated to save U.S. customers \$8 to \$10 billion yearly at the retail level, with more savings realized when including other pharmacy distribution outlets such as hospitals and nursing homes. The generic pharmaceutical industry supports efforts to promote free market forces and supports the development of an abbreviated regulatory approval process for biogenerics or biosimilars. The generic pharmaceutical industry wants faster FDA review times for ANDAs. It is strongly opposed to brand-name (research-intensive) drug industry efforts to extend patents and other tactics to delay market introduction of generic drug products, such as patent extensions for minor changes in formulations or processes and unsubstantiated citizen petitions to block FDA approval of generic applications. The unbranded generic industry has challenged the FDA's regulatory policies in approving authorized generics. The generic pharmaceutical industry claims that by merely changing their label, the brand-name companies compete with the first generic drug company at a period in which the first generic sponsor should have exclusive marketing

rights (for 180 days) without competition by any product other than the original brand label. It also opposes foreign importation of drug products at the retail level.

Future Implications

Mergers, acquisitions, and other consolidations among the major pharmaceutical companies are anticipated to continue, and the nature of the pharmaceutical industry is changing. Fewer blockbuster drug products (i.e., products with annual global sales of at least \$1 billion) have been approved in recent years, with drugs in the research pipelines appearing less promising for the traditional research-based pharmaceutical industry than for the growing biotech pharmaceutical sector.

It has been estimated that Big Pharma lost \$14 billion in sales as the result of patent expirations and increased generic competition in 2006. In the future, while the companies will remain profitable, revenues are likely to decline because many of their drug products are coming off patent between 2008 and 2012 (e.g., Fosamax, Valtrix, Advair, Lipitor, Plavix, and Crestor).

In light of these patent expirations, more limited pipeline resources, and declining sales, many major pharma companies are reorganizing. In recent years, many companies have attempted to have leaner operations by laying off employees and streamlining programs.

Predicted trends for the pharmaceutical industry include the increased use of outsourcing and global licensing because of reduced regulatory monitoring and decreased costs. The U.S. pharmaceutical industry (research and generic) already outsources much of its production to offshore territories (e.g., Puerto Rico) and overseas countries, especially the emerging markets of India, China, and Eastern Europe. While the FDA inspects these facilities (for drug products legitimately sold in the United States), the oversight is less stringent than the routine inspections in U.S.-based corporations.

Last, the future outlooks of the pharmaceutical industry will include increasing regulatory consideration of biosimilars. The European Commission granted Sandoz approval to market a biosimilar version of epoetin alfa, or EPO (indicated for treatment of anemia) in 2007, becoming the first biogeneric product approved in the European EPO

market. While predicted to be a potential blockbuster, the ultimate impact of this regulatory action is unknown. Sandoz's Omnitrope (somatropin, rDNA origin), a biosimilar version of Pfizer's human growth hormone Genotropin, was marketed under special rules in the United States and Europe in 2006. Its sales, however, represent less than 1% of the market. Perhaps its low market share was due to the drug's relatively high price and physician concerns about its bioequivalence. In 2007, legislation was introduced in the U.S. Congress (H.R. 1038 and S. 623, Access to Life-Saving Medicine Act) to provide for the licensing of therapeutically equivalent biological medicines, which would mandate the FDA to create an abbreviated approval process for biological products. However, Congress took no action.

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See also Cost of Healthcare; Direct-to-Consumer Advertising (DTCA); Medicare Part D Prescription Drug Benefit; Pharmacy; Pharmacoeconomics; Prescription and Generic Drug Use; U.S. Food and Drug Administration (FDA)

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- IMS Health: <http://www.imshealth.com>
- Pharmaceutical Research and Manufacturers of America (PhRMA): <http://www.phrma.org>
- U.S. Food and Drug Administration (FDA): <http://www.fda.gov>

PHARMACOECONOMICS

Pharmacoeconomics can be defined as the description and analysis of the costs and consequences of pharmaceutical products and services and their impact on individuals, the healthcare system, and society at large. Pharmacoeconomics as a field of research arose in the late 1970s in response to rising expenditures on prescriptions and growing concerns regarding cost containment of drug budgets. The underlying purpose of pharmacoeconomic analysis is to promote the efficient use of healthcare resources by informing treatment choices and related policy.

Background

Pharmacoeconomics has ties to both economic evaluation and health outcomes research. Many of the theoretical methods have roots in social welfare and cost-benefit analysis that are found in public finance and environmental economics. The field is also related to decision analysis and corporate finance principles often used in evaluating corporate business decisions.

Categories of Study Methods

Within pharmacoeconomics, there are four general subcategories of study methods: (1) cost-minimization analysis (CMA), (2) cost-effectiveness

analysis (CEA), (3) cost-utility analysis (CUA), and (4) cost-benefit analysis (CBA). These four subcategories are differentiated according to how health outcomes are measured: CMA requires that the health effects of the alternatives in question are equal. CEA measures health outcomes in some natural unit (e.g., life years). CUA is very similar to CEA except that the unit of health is quality-adjusted life years (QALYs). These units are formed by assigning health status (e.g., mild angina) a preference-based utility score, typically between 0 and 1, where 1 represents perfect health and 0 represents death, and then multiplying life years in a particular health state by the preference score of that health state (e.g., 10 years in a health state with a utility score of 0.7 results in 7 QALYs). The scores themselves come from survey-based methods, and there are various methodologies for obtaining the utility scores. Finally, CBA measures health effects in dollars, which often involves some means of translating health gains into a dollar value. All four subcategories consider costs measured in dollars.

Data Sources

There are numerous potential sources of data for quantifying costs and outcomes for use in a pharmacoeconomics analysis, ranging from prospective data collection to analyses of administrative databases to information based on surveys of experts. In addition, information from randomized clinical trials or from pharmacoepidemiologic studies can be examined in combination with cost information. Any pharmacoeconomic study is limited by the availability of data related to what treatments it sets out to compare. In addition, data are typically available from a particular patient population, a particular time period, and a particular setting. Consequently, studies often involve the use of models to project results across patient populations, and to project costs and outcomes into time horizons beyond the research of existing data.

Determining Costs

A key aspect of pharmacoeconomics is consideration of costs beyond just the simple cost of the drug. Examples of other costs that can be included are the personnel, equipment, or facilities used in

administering treatment, the cost of treating side effects, the costs associated with healthcare utilization (e.g., physician office visits or hospitalizations), or the cost of patient time that is spent during treatment, to name a few. Finally, the costs of pain and suffering from a treatment or disease can be considered. Note, that a central element of a pharmacoeconomic analysis is the choice of the study perspective, where a societal perspective is generally felt to be the most relevant in terms of informing national policy (other perspectives include the payer perspective, the provider perspective, and the employer perspective). The study perspective fundamentally determines what costs are included in the analysis, which is a reason that studies that take a broad perspective, such as a societal perspective, are considered to be of greater importance. However, data availability and available budgets for research may limit the perspective that research can cover. More important, it is the research question (or decision to be made) that dictates the appropriate perspective.

Decision Making

In terms of how the results inform decisions, CMA identifies the lowest-cost treatment among two or more with the same effect. CEA and CUA identify treatments that cost more and provide equal or lower amounts of a health outcome, a choice that is never favorable. CEA and CUA also measure the additional spending that is required per gain in additional units of health outcome in making a treatment switch to a higher-cost, higher-effect treatment (or *visa versa*). By identifying the cost of increasing health in particular treatment options, CEA and CUA promote efficient treatment choices. Currently, treatment adoptions with cost-to-QALYs ratios lower than \$100,000 are generally considered favorable. Cost-benefit analysis typically provides a direct calculation of the net benefit of making a treatment change, defined as the change in benefits minus the change in costs. When the change in treatment is deemed to have a positive net benefit, then that change is recommended.

Currently, CUA with a societal perspective is considered the gold standard strategy among pharmacoeconomic analysts, though this is not without controversy. While many feel that QALYs

are the best available measure of general health outcomes, many also feel that the measurement techniques to acquire QALYs are flawed and that there are too many underlying assumptions that go into aggregating QALYs (e.g., that an added QALY for an elderly person is the same as for a younger person) for them to adequately inform actual policy decisions. Suffice to say that development of appropriate measures of health outcomes and notions of how to best apply aggregated results to inform policy toward health treatments is an ongoing process.

Future Implications

Pharmacoeconomics continues to grow, as measured by the number of published articles and books, the number of researchers, as well as the number of dollars spent on research in the field. Many nations require pharmacoeconomic analyses as part of the drug approval process. Although the U.S. Food and Drug Administration (FDA) does not currently require pharmacoeconomic analyses in its approval process, a growing number of healthcare organizations are including pharmacoeconomic evidence in their decision-making processes. In addition, many of the nation's pharmacy schools require pharmacoeconomics in the curriculum of their students, and there are a number of graduate programs available that include concentrations in pharmacoeconomics.

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See also Cost-Benefit and Cost-Effectiveness Analysis; Cost of Healthcare; Health Economics; Outcomes Movement; Pharmaceutical Industry; Pharmacy; Public Policy; Quality-Adjusted Life Years (QALYs)

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 Society for Medical Decision Making (SMDM): <http://www.smdm.org>

PHARMACY

For the general public, pharmacists are often the most accessible health professionals for patients to obtain information and advice. Currently, there are about 245,000 licensed pharmacists employed in the United States, which ranks pharmacy as the nation's third-largest health profession. There are also about 285,000 employed pharmacy technicians. Pharmacists help ensure the rational and safe use of drug therapies by working to achieve positive therapeutic outcomes, improve the quality of life for patients, reduce healthcare costs, and minimize patient risk from drug-related morbidity and mortality.

Pharmacists are increasingly expanding their roles in healthcare. Specifically, they are advising physicians, nurses, and other health professionals on medication selection, dosages, use, interactions, and side effects; dispensing medications and monitoring patients for expected outcomes and adverse effects; and educating and counseling patients on prescription and nonprescription drugs, dietary supplements, self-care, and other healthcare topics.

As recognized medication-use experts, pharmacists are well educated on the composition and characteristics of pharmaceuticals (e.g., chemical, pharmacological, and physical properties), their manufacture and/or preparation, and use. Pharmacists strive to verify the quality of drugs and related ingredients in the supply chain to help ensure drug purity, strength, and proper labeling for improved patient safety.

History of American Pharmacy

The existence of pharmacists was rare in Colonial America. Drugs and “patent medicines” (i.e., cheap and supposedly curative tonics, pills, and other concoctions, which often contained large proportions of alcohol, opium, or laxatives) were readily available and hawked for sale without a prescription at general stores and by traveling salesmen. In the late 1700s, physicians compounded drugs they prescribed (i.e., prepared specially customized medicines), or their apprentices prepared the drugs under their supervision. Apothecary shops were generally owned by physicians and were located in large cities. The local drug clerk was a shop employee whose role was more akin to a wholesaler than retailer; the drug clerk primarily compounded, stocked, and distributed medicines for physicians. The job of the drug clerk was viewed as a trade occupation, which was best learned by daily application of repetitive practices. The apprentice drug clerks eventually developed more expertise in pharmaceuticals, far beyond the knowledge of most physicians, and they enjoyed a close working relationship with physicians, since they usually operated the shops on behalf of them.

Over time, the physician-owners of the shops moved away and/or sold their businesses to their former drug clerks, which began the establishment of the independent retail drugstore trade. In the early to mid-1800s, independent apothecary shops and drugstores proliferated, and the businesses became increasingly profitable. As proprietors, the former drug clerks adopted the titled of apothecaries or druggists (and a few called themselves pharmacists). The first college of pharmacy was established in Philadelphia in 1821, and a small number of other pharmacy colleges were founded, though most druggist-practitioners lacked formal training. From the mid-1800s through the early 1900s, the country lacked laws and regulations governing foods, drugs, and healthcare practice. The sale of inefficacious, possibly poisonous, and mislabeled patent medicines were sold by self-designated apothecaries and other merchants. Some 19th-century druggists diagnosed patients and dispensed medicines, which conflicted with medical practice. Physicians widely criticized the apprentice-trained employees as unknowledgeable and

unscrupulous. Many physicians continued to dispense their own medicines, and a widening rift developed between pharmacy and clinical medicine.

By the early 1900s, federal legislation and regulations helped improve safety and quality of the drug supply to some extent. Medical education, training, and practice underwent substantial change. Most physicians stopped or limited their dispensing of medicines, and druggists compromised by limiting their diagnosing to minor illnesses. During the Prohibition Era (1920–1933), drugstores were popular hangouts because druggists could dispense alcohol for medicinal purposes. Regulatory change of certain drug products to prescription-only status in the early 1900s eliminated the discretionary latitude of pharmacists in dispensing certain medications over the counter. Mass manufacturing of drug products by the pharmaceutical industry began around the same time, which greatly reduced compounding activities by pharmacists. By the 1960s, pharmacy practice started to evolve from the product-oriented distributive focus to include more patient-oriented clinical roles.

Laws and regulations, professional standards, and a professional code of ethics underpin contemporary pharmacist roles. Leaders in the profession embraced the clinical pharmacy movement in the 1970s to the 1990s, when the concept of pharmaceutical care was conceptualized. Today, pharmaceutical care is defined as assuming responsibility for providing drug therapy intended to produce outcomes that improve the patient’s quality of life. The changing healthcare marketplace, societal need, shifting of some drugs from prescription to nonprescription status, advent of computerization and other automated systems, and educational reforms help shape pharmacy practice.

Education

Throughout the 20th century, inconsistent pharmacy educational requirements resulted in disjointed perceptions of pharmacists and fragmented philosophies of practice. More formalized pharmacy education programs were established by the early 1900s, including 2-year diploma programs and a few 3-year and 4-year programs. The minimum educational requirement for pharmacy increased to 3 years in 1925 and increased to a

4-year bachelor of science degree in 1932. By the 1950s, many pharmacy schools had expanded the degree program requirements to a 5-year bachelor's degree, which became the minimum standard in 1960.

Most of the nation's pharmacy degree programs in the 1960s and 1970s were heavily science based, with curriculums focused on chemistry and other physical sciences. Clinical therapeutics courses were added to the curricula at most pharmacy programs by the 1970s. A number of pharmacy schools converted their programs to a 6-year doctor of pharmacy (PharmD) degree by the 1980s, though the majority of colleges continued to offer the 5-year bachelor's degree as the entry-level degree in pharmacy. At that time, the doctor of pharmacy degree was typically available as an advanced postbaccalaureate degree.

A protracted debate ensued among members of the profession, major pharmacy providers, and the academic community as to whether there was the need for the advanced clinical degree for all pharmacists. A dual system of pharmacy education (bachelor's degree and doctor of pharmacy) persisted for decades in a contentious atmosphere of strong support for and opposition to the all-doctor of pharmacy standard for professional education. The debate ended in 1992, when the accrediting body (now the Accreditation Council for Pharmacy Education [ACPE]) announced its intent to recognize only the doctor of pharmacy as the first professional degree. Since 2004, the doctor of pharmacy has been the only professional pharmacy degree program accredited by ACPE.

The doctor of pharmacy (PharmD) is designed to take a minimum of 6 academic years, including 2 years of prepharmacy requirements and 4 years of pharmacy school. Admission to pharmacy school is highly competitive. Applicants must have high academic achievement in courses such as biology, chemistry, physics, and calculus. More pharmacy schools are also requiring students to take various liberal arts courses such as communication and economics to have a broader education. Most pharmacy schools require Pharmacy College Admission Test (PCAT) scores and interviews before applicants are considered for admission. The pharmacy school curriculum includes strong foundations in the basic pharmacy sciences (e.g., medicinal chemistry, pharmacology, pharmacognosy, or natural

products, pharmaceuticals, pharmacokinetics, and physiology), the social, behavioral, and administrative sciences (e.g., communications, health systems analysis and services delivery, pharmacoeconomics, and management), and pharmacotherapeutics (e.g., clinical pharmacy). Early experiential education is included throughout the curriculum, and advanced pharmacy practice experiential education (i.e., clerkships) is offered during the final year of study. Graduate programs (leading to master's and doctoral degrees) are also available in specific areas of the pharmaceutical sciences, but these research-based graduate degree programs do not generally require a background in pharmacy as a prerequisite for admission. More than 100 accredited pharmacy schools exist in the United States, and these programs graduate approximately 9,000 pharmacists annually.

Optional postgraduate training opportunities exist in pharmacy. More than 1,500 pharmacists complete a residency each year. A pharmacy residency is an organized, postgraduate training program in professional practice and management activities. Pharmacy residency programs are mainly located in the hospitals or ambulatory-care settings but also include home care and long-term care facilities, managed-care facilities, community pharmacies, and other settings. The American Society of Health-System Pharmacists (ASHP) accredits more than 800 residency programs, and the training programs cover diverse practice areas, such as ambulatory care, cardiology, critical care, informatics, psychiatric pharmacy, and transplantation. Residency programs usually last 1 year (though a few are 2 years in duration), and some pharmacists complete a second, specialized residency after 1 year of general pharmacy residency training. A pharmacy fellowship, typically lasting 2 years, is a highly individualized postgraduate training program to develop research skills for pharmacists. The pharmacy fellow is under the direction of an experienced researcher-preceptor, usually in the academic or the pharmaceutical industry sector.

Licensure and Credentialing

Graduates of accredited pharmacy programs in the United States must pass state board examinations to earn a license to practice pharmacy. Initial

state licensure as a registered pharmacist is gained by passing the North American Pharmacist Licensure Examination (NAPLEX), the appropriate sections of the Multistate Pharmacy Jurisprudence Examination, both of which are administered by the National Association of Boards of Pharmacy (NABP), and/or other state requirements. Mechanisms exist to transfer NAPLEX scores (during initial licensing) and to transfer existing licenses (reciprocity) to gain licensure in more than one state or jurisdiction. A certification process is established by NABP and individual state boards to allow foreign pharmacy graduates (who pass the Foreign Pharmacy Graduate Equivalency Examination and provide documentation of sufficient foreign pharmacy education) to become eligible to take the NAPLEX. Pharmacists are expected to maintain professional competence, legal requirements, ethical standards, and continuing professional education to maintain their licensure.

At the highest recognized level of specialization, pharmacists in certain fields may become board certified through programs administered by the Board of Pharmaceutical Specialties (BPS). Board certification does not grant the recipient any legal authority. However, certification offers advantages in knowledge gained, competitive job advantages, and recognized expertise for third-party payers. BPS-specialties exist in nuclear pharmacy, nutrition support pharmacy, oncology pharmacy, pharmacotherapy (including added qualifications for subspecialists in cardiology and infectious diseases), and psychiatric pharmacy. Nearly 7,000 pharmacists (about 3% of the workforce) were board certified in 2007. In addition to BPS certification, pharmacists can develop specialized areas of practice through residency or fellowship training, certificate programs in disease state management and other areas of practice, or extensive work experience.

The role of pharmacists continues to expand, partly due to increasing numbers of pharmacists specializing in practice areas and participating in disease state management. Certain states have enacted legislation to enable collaborative practice between pharmacists and physicians based on set protocols. Through such collaborative drug therapy management agreements, qualified pharmacists may perform patient assessments, order

drug-therapy-related tests, administer medications, and order and monitor drug regimens.

Pharmacy Technicians

Pharmacists often are assisted by pharmacy technicians who provide technical support. Depending on individual state practice acts and regulations, pharmacy technicians may enter medication orders, prepare medications and supplies for dispensing (e.g., counting and labeling), stock and transport medications, purchase drugs, manage narcotics inventories, answer telephone inquiries, and conduct other administrative duties. Roles of pharmacy technicians are determined by their employer, and their work must be supervised under the direction of a registered pharmacist. There are no uniform qualifications for pharmacy technicians, and requirements vary across states and practice settings. Most, though not all, states require that pharmacy technicians be high school graduates or equivalent. Pharmacy technicians may be trained informally or formally on the job, in vocational programs, community colleges, or the U.S. military; training program lengths range from 1 day to 2 years. Increasingly, employers and some states are requiring that pharmacy technicians obtain certification, primarily by the Pharmacy Technician Certification Board (PTCB) or by the Institute for the Certification of Pharmacy Technicians (ICPT).

Pharmacist Associations

Hundreds of pharmacist associations exist to serve member needs, including government relations, public relations, continuing education, professional standards development, meetings, products and services, and other professional activities. The three largest pharmacist associations are (1) the American Pharmacists Association (APhA), (2) the American Society of Health-System Pharmacists (ASHP), and (3) the National Community Pharmacists Association (NCPA).

Founded in 1852, the APhA (formerly the American Pharmaceutical Association), which is located in Washington, D.C., is the oldest professional pharmacist society. The APhA has a membership of approximately 60,000 pharmacists, pharmacy students, and pharmacy technicians.

The ASHP (formerly the American Society of Hospital Pharmacists), which is located in Bethesda, Maryland, has the largest annual budget of any pharmacist association, at approximately \$40 million. Its membership consists of about 30,000 pharmacists whose practice settings include hospitals, health maintenance organizations (HMOs), patients' homes, and long-term care facilities.

The NCPA, which was founded in 1898 as the National Association of Retail Druggists, is headquartered in Alexandria, Virginia. It represents approximately 23,000 members who practice in independent community pharmacies.

Other major pharmacist associations represent managed-care practitioners (Academy of Managed Care Pharmacists), clinical specialists in pharmacy practice and research (American College of Clinical Pharmacy), compounding pharmacists (International Academy of Compounding Pharmacists), and minority pharmacists (National Pharmaceutical Association).

Affiliate member status is available for pharmacy technicians in most of the major pharmacist associations, but the primary group representing them is the American Association of Pharmacy Technicians (AAPT).

Other important related associations are the National Association of Chain Drug Stores (NACDS) and the Pharmaceutical Care Management Association, which represent chain drugstores and pharmacy benefit managers, respectively.

Future Implications

Currently, about 60% of pharmacists work in community pharmacies (e.g., independently owned pharmacies, chain drugstores, mass merchandisers, and supermarket pharmacies). About 20% of pharmacists work in healthcare institutions (e.g., hospitals, nursing homes, and health clinics). The remaining pharmacists work in various areas such as the federal government, academia, the pharmaceutical industry, managed-care organizations, professional associations, and public health agencies, among others.

Although salary ranges vary widely across geographic regions and practice settings, the median annual pharmacist salaries ranged between about \$83,000 and \$108,000 in 2006. And because of the

increasing demand for pharmacists, their salaries continue to rise each year.

The future employment outlook for pharmacists is very promising. Pharmacists are in increasing demand because of the greater use of prescription drugs, demographic trends such as the aging of the population, and the increasing incidence of chronic diseases. It is anticipated that there will be a national shortage of 112,000 to 157,000 pharmacists by 2020. It is also estimated that about 91,000 additional pharmacy technicians will be needed by 2016. Future workforce projections will be influenced by the attrition rate of older pharmacists, shifts in full-time-equivalent positions (currently 85% of practitioners) versus the growing part-time employment in pharmacy practice, the continued expansion of existing and new pharmacy school degree programs, and effective use of support personnel and automation.

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See also Direct-to-Consumer Advertising (DTCA); Medicare Part D Prescription Drug Benefit; Patient Safety; Pharmaceutical Industry; Pharmacoeconomics; Prescription and Generic Drug Use; U.S. Food and Drug Administration (FDA)

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- National Association of Boards of Pharmacy (NABP):
<http://www.nabp.net>
- National Association of Chain Drug Stores (NACDS):
<http://www.nacds.org>
- National Community Pharmacists Association (NCPA):
<http://www.ncpanet.org>
- Pharmaceutical Care Management Association (PCMA):
<http://www.pcmanet.org>
- Pharmacy Technician Certification Board (PTCB):
<http://www.ptcb.org>

PHYSICIAN ASSISTANTS

Physician assistants play an important role in America’s healthcare system, working in areas often not directly served by physicians. In 2008, there were about 68,000 physician assistants delivering healthcare in the nation. Physician assistants are trained to diagnose health conditions and administer therapy under the direction of a supervising physician. They are an integral part of healthcare teams. They often take patients’ medical histories, examine and treat patients within their respective range of knowledge, and order and interpret laboratory tests and X rays, as well as make specific diagnoses. They may perform simple medical procedures such as stitching cuts and splinting and casting broken limbs. Physician assistants are allowed to prescribe medications in 48 states and the District of Columbia; they may also be responsible for managerial

duties, such as ordering supplies and equipment and supervising others.

Background

During the 1960s, the United States had a shortage of physicians. During the Vietnam War, many medical corpsmen returned from their tour of duty looking for suitable employment in which to apply the skills they learned while in military service. The physician assistant vocation was viewed as a measure to aid the delivery of primary care, while extending the practice of physicians.

The first program in the nation to train physician assistants was established at Duke University in 1967. The program’s goal was to make health-care available to all people, especially those living in underserved areas. Federal grants allowed the expansion of physician assistant programs, and between 1970 and 1980 the number of programs grew from 12 to 56.

Education Programs

Today, about 12,000 students are enrolled in 141 accredited physician assistant educational programs in the nation. Most programs (121) offer students the opportunity of earning a master’s degree. The other programs allow students to earn either a bachelor’s degree or an associate degree. Each program has its own admission requirements, but all require at least 4 years of college and some healthcare experience prior to admission.

Like medical students, physician assistant students take a variety of science courses, such as biology, chemistry, and mathematics. They also take courses in various subspecialties, including pharmacology, human growth and development, and human physiology. The students receive their clinical training in various medical specialties, such as obstetrics-gynecology, general surgery, and otolaryngology. Depending on the program, some students have the option of serving on more than one clinical rotation.

Physician assistants are not bound to one specialty. That is, if a physician assistant wants additional education to gain new skills, he or she has the option of doing so. For example, it is common for physician assistants to receive additional instruction in specialties such as pediatrics or

emergency medicine. To meet common healthcare challenges found in underserved areas, many physician assistants enroll in postgraduate educational programs that emphasize disciplines critical to rural and/or inner-city communities.

Licensure

To gain licensure, each state requires a physician assistant to complete an accredited, recognized curriculum of study as well as pass a qualifying examination. Physician assistant programs typically last 2 years and require full-time attendance. Some courses in the curricula are given in university health clinics, medical schools, and traditional colleges and universities, while others are given at community colleges, in military establishments, or in hospitals.

Each state and the District of Columbia have laws specifying the requirements and qualifications needed to become a physician assistant. All require physician assistants to successfully pass the Physician Assistant National Certifying Examination (PANCE), which is given by the National Commission on Certification of Physician Assistants (NCCPA). The examination is available only to graduates of accredited physician assistant education programs. To retain certification, physician assistants need to take 100 hours of continuing medical education every 24 months. Every 72 months, they must take a recertification examination.

Scope of Work

All professional medical services provided by physician assistants are under the guidance of a physician. However, in many rural areas where there are few physicians, the physician assistants are often the primary medical-care providers. In scenarios such as this, the physician assistants discuss each case with the overseeing physician, as mandated by statutory law. Unlike many physicians, physician assistants visit patients in their home, travel to various hospitals and nursing homes to see how patients are progressing, and then report everything back to the physician.

Like physicians, physician assistants often specialize in areas such as general practice, cardiology, and psychiatry. Other specialty areas include

neurology, internal medicine, and surgery. Physician assistants with specialties in surgery provide both preoperative and postoperative treatment and are often the physician's primary assistants if major surgery is required. The physician assistant's work setting depends on his or her supervising physician. For example, some work mainly in an office, whereas others assist with surgeries. Physician assistants working in hospitals usually have a variety of schedules and are often on call. On the other hand, physician assistants employed in physicians' clinics usually work 40 hours per week.

Future Implications

The demand for physician assistants is expected to continue to grow in the future much faster than the average job growth for all occupations in the nation. The U.S. Bureau of Labor Statistics projects rapid job growth for physician assistants because of the general expansion of healthcare and an emphasis on cost containment, which will result in the increasing use of physician assistants by healthcare organizations. Job opportunities will likely be in rural and inner-city clinics because these settings have difficulty attracting physicians.

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See also Access to Healthcare; Nurse Practitioners (NPs); Nurses; Physicians; Physician Workforce Issues; Primary Care; Public Health

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<http://www.aapa.org>

Bureau of Health Professions (BHPr): <http://bhpr.hrsa.gov>

Bureau of Labor Statistics (BLS): <http://www.bls.gov>

Duke University, Physician Assistant History Center
 (PAHx): <http://www.pahx.org>

PHYSICIANS

Physicians are medical practitioners who focus on improving human health through the study, diagnosis, and treatment of disease and injury. Physicians are able to apply their knowledge and the science of medicine after much training and specialized studies. Physicians play a vital role in the nation's healthcare system, and they may work directly with patients in a clinical setting or conduct medical research. Although physicians make up less than 10% of the nation's total medical workforce, they command enormous resources, and the entire healthcare industry is usually subordinate to their professional authority in clinical matters and research.

Overview

Modern medicine in the United States dates back to the latter half of the 18th century when the first medical school was founded at the University of Pennsylvania. Quickly thereafter, there was a push to standardize the practice of medicine. In 1847, the American Medical Association (AMA) was established; with this came the initiation of licensing laws and accreditation standards for medical schools. The strength of the AMA was illustrated with the publication of the landmark report *Medical Education in the United States and Canada*, more commonly known as the Flexner Report, in 1910, which subsequently led to the closure of a number of medical schools that did not meet the AMA's criteria. Another consequence of the Flexner Report was the curtailment of the supply of physicians. Standardization of medicine continued in many ways, including the establishment of the National Board of Medical Examiners (NBME) in 1915, whose function was to administer

a standardized licensing examination to physicians, the United States Medical Licensing Examination (USMLE).

Entrance Into Medical School

Motivations to enter the field of medicine, while unique to the individual who pursues this path, generally include factors such as the desire to help others in a healing capacity, service in the context of science, technology, and research, and preference for an autonomous profession. Medical school admission requirements include successful completion of the Medical College Admissions Test (MCAT), a standardized test comprising three sections of physical sciences, biological sciences, and verbal reasoning, scored from 1 to 15 points, as well as two writing samples. An application is typically submitted through the American Medical College Application Service (AMCAS), which processes applications for the majority of allopathic medical schools, or through the American Association of Osteopathic Medicine (AACOM) for osteopathic medical schools.

This highly selective and competitive process draws serious and motivated students. Applicant data are collected annually and shows that most accepted applicants earned an average of 10 to 15 points on each section of the MCAT. Moreover, they have an undergraduate cumulative grade point average in science of 3.75 on a 4.0 scale. Recently, there have been an increasing number of female applicants to medical schools, and approximately 60% of students are female. Most applicants are White. Blacks, Native Americans, Mexican Americans, and mainland Puerto Ricans comprise about 12% of all medical students, while these groups together comprise about 20% of the nation's overall population.

On graduating from medical school, physicians enter medical residency programs to continue their training. These programs run from 3 to 8 years in length, and, generally, osteopathic physicians must complete a 12-month rotation prior to entry. After residency, physicians obtain a state license to practice medicine. Licensing laws are set by state boards of medicine that require graduation from an accredited medical school and passing the three steps of the USMLE to obtain a license. Furthermore,

these boards set certain standards for physicians, such as qualifications for a license and standards of practice, and they have authority over disciplinary action.

Allopathic and Osteopathic Physicians and International Medical Graduates

All physicians, including allopathic physicians (MDs) and osteopathic physicians (DOs) have the role of evaluating, diagnosing, and treating patients. However, these medical providers accomplish their goals in distinct roles, as most MDs are specialists whereas most DOs are primarily general practitioners.

Allopathic medicine is generally regarded as the traditional (Western) practice of medicine and its study leads to the doctor of medicine degree (MD) in any of the 126 accredited schools of medicine in the nation. These schools are accredited by the AAMC and graduate about 14,500 students per year.

Osteopathic medicine, however, has a history distinct from the allopathic school of thought. In 1892, Andrew T. Still, the father of osteopathic medicine, founded the American School of Osteopathy, which has since changed its name to the Kirksville College of Osteopathic Medicine, in Kirksville, Missouri. The school was founded on the core beliefs of osteopathy that stress holistic medicine, manipulative therapies, and the importance of the neuromusculoskeletal system. These beliefs still prevail today and are taught in conjunction with academic courses similar to those offered in allopathic schools of medicine. At the completion of their four-year education in one of the 19 U.S. osteopathic schools of medicine, osteopathic students earn a DO (or doctor of osteopathy or doctor of osteopathic medicine) degree, and they can then enter into either osteopathic or allopathic residency programs. About 2,500 students graduate from osteopathic schools of medicine annually, and about two thirds of DOs go through allopathic medical residencies. Ultimately, most DOs are in general practice, and they account for about 6% of all active physicians in the nation.

International Medical Graduates (IMGs) comprise about 25% of all residency positions and account for about a quarter of all active physicians in the nation. These individuals have graduated

from medical schools in countries outside the United States, including Puerto Rico and Canada. The Educational Commission for Foreign Medical Graduates (ECFMG) must certify IMGs prior to their entrance into U.S. graduate medical education programs. To receive certification, IMGs must pass both the Test of English as a Foreign Language (TOEFL) and the USMLE. In addition, as of 1988, IMGs must also pass the Clinical Skills Assessment (CSA) examination. Many influential organizations, including the AMA, the national Institute of Medicine (IOM), and the Pew Health Professions Commission have called for a reduction in the number of IMGs in residency programs citing the fact that they are not helping the problem of the maldistribution of physicians in the nation. Despite the fact that most IMGs train in underserved areas, most practice in nonunderserved areas.

Need for Physicians

The federal government plays an important but indirect role in the number of physicians in the United States by funding both medical school education and medical residency programs. Moreover, the government also influences the number of physicians practicing in specialties or primary care by regulating the amount of funds for training in these areas. Importantly, some believe that access to healthcare itself can be managed by exercising control over the supply of physicians.

Supply of Physicians

In the early 1960s, the ratio of physicians to the population was 140 physicians per 100,000 people in the nation. Many felt this ratio was too low and that there was a national physician shortage. To overcome the shortage, the U.S. Congress enacted the Higher Education Facilities Act (PL 88-204) in 1963, and efforts were made to both increase the enrollment of students in existing medical schools and create new schools across the nation. Eventually, 40 new medical schools were created, and many more physicians graduated from medical school. By 1980, the ratio of physicians to the population rose to 202 physicians per 100,000 people. The federal Civil Rights Act of 1964 (PL 88-352) also increased the national supply of physicians, particularly of Blacks and

women. In fact, between 1965 and 1999, the number of women graduates from the nation's medical schools increased from 7% to 43%. Similarly, there was an increase in the total number of women physicians in active practice from 7% in 1970 to 21% in 1999.

The Graduate Medical Education National Advisory Committee (GMENAC), which consisted of a panel of prominent experts, was established in 1976 to assess the success of the effort to overcome the national physician shortage problem. Commissioned by the U.S. Department of Health and Human Services (HHS), GMENAC was given the task of determining the following: (a) the number of physicians required to meet the healthcare needs of the nation, (b) the most appropriate specialty distribution of these physicians, (c) the most favorable geographic distribution of physicians, (d) appropriate ways to finance the graduate medical education of physicians, and (e) the strategies that can achieve the recommendations formulated by the committee. GMENAC published its findings in 1980 and concluded that there was no longer a national shortage of physicians. Rather, it predicted, there would be an excess number of physicians by the 1990s. Also, the committee noted concerns related to geographic and primary-care shortages, specifically in the areas of general medicine and child psychiatry, and failure to meet its suggested ratio of between 145 and 185 physicians per 100,000 people. The trend of training more physicians continued, with the number of physicians in the nation increasing by 173% between 1950 and 1990. Consequently, the Pew Commission published data in the mid-1990s predicting that there would be a surplus of physicians and called for the closing of 20% of medical schools and for a 25% reduction in the number of medical residency positions. Along with the increasing number of physicians there were also rising costs associated with their training. To curtail this, the federal Balanced Budget Act of 1997 capped the total number of medical residents funded by the Medicare program and also reduced payments to residency programs.

Demand for Physicians

The demand for physicians is a function of access to healthcare. The total number of physicians and the physician to population ratio do not present an

entirely accurate picture of access to care, as there are significant problems with the maldistribution of providers. In particular, physicians are not evenly distributed across geography or by specialty, which has resulted in shortages in rural areas and in primary care. The geographic maldistribution of physicians generally means that some areas lack adequate numbers of physicians whereas others have a sufficient number or even an oversupply. There are severe shortages of healthcare services in many rural areas, particularly in areas with populations of less than 5,000 individuals. People who reside in these areas must rely on only 5 physicians per 10,000 residents. Approximately 20% of the nation's population lives in these areas, which only have about 9% of the nation's physicians. Furthermore, although cities generally report an adequate number of practicing physicians, in many instances, they are not distributed equally within the cities. As a result, there are local communities that need more physicians. In fact, some urban areas have physician to population ratios as low as 10 physicians per 100,000 people.

Some steps have been taken to compensate for these shortages of physicians. In 1970, the federal National Health Service Corps (NHSC) was established with the mission of recruiting and retaining physicians and other health professionals in shortage areas. To entice people to join the NHSC, scholarships and loan repayments are offered, providing that the minimum 2 years of service are completed. This program has placed more than 20,000 health professionals since its inception. Additionally, guidelines were developed for the designation of Medically Underserved Areas (MUAs) in 1973. MUA status was determined by using a four part Index of Medical Underservice that looked at the percentage of the population below the federal poverty level, the percentage of the population 65 years of age or older, the infant mortality rate, and the physician to population ratio. In 1976, similar guidelines were set for the designation of Health Manpower Shortage Areas (HMSAs) under the Health Professionals Education Assistance Act. These guidelines outlined three different types of primary-care HMSAs: (1) geographic areas, (2) population groups, and (3) medical facilities. Another effort to combat the geographic shortage of physicians was the development of Community and Migrant Health Centers

(C/MHCs), which have been important in providing services to patients in rural areas. For example, in 2000, about 53% of all C/MHCs were located in rural areas and served more than 9 million people. The enactment of the federal Rural Health Clinics Act in 1977 instituted a successful reimbursement strategy to help deal with the lack of physicians in rural areas. This legislation allowed physician assistants, nurse practitioners, and certified nurse midwives associated with rural clinics to practice without the supervision of a physician. Also, this act gave rural health clinics eligibility for reimbursement from Medicaid at a higher rate, matching that provided by Medicare.

Medical schools have also taken steps toward overcoming the physician shortages in rural areas. Schools such as Philadelphia's Thomas Jefferson School of Medicine and the University of Illinois College of Medicine have implemented programs to deal with geographic shortages. A 2001 study of the Physician Shortage Area Program of the Thomas Jefferson School of Medicine found that it was successful in contributing to the supply of physicians practicing in rural and underserved areas. The study noted that the program's selection criteria, which almost exclusively favor admission for students from rural areas, coupled with its emphasis on primary care during training were the key reasons for its success.

The imbalance between specialists and primary-care physicians is another obstacle limiting access to healthcare. Reasons for specialty maldistribution include medical technology, reimbursement methods, and specialty-oriented medical education. Medical technology is expanding at a rapid pace, and it may appeal to medical students who are further attracted into specialties because their training is organized around it. Moreover, reimbursement and remuneration of specialists is higher compared to primary-care physicians, which may deflect interest in pursuing a career in primary care. These factors have been linked to fluctuations in the number of medical students who match residencies in internal medicine, pediatrics, and family care. These fields were most popular in 1998 and had a match rate of 53%, but interest has dropped, and in 2002 only 44% of students matched in these areas of practice. Specifically, rates between 1998 and 2002 decreased from 24% to 22% in internal medicine, 16% to 10% in family medicine, and

13% to 12% in pediatrics. However, it is difficult to predict the numbers of medical residents who will actually practice in primary care, since many of them enter fellowship programs and subspecialize. This dichotomy has grown larger over time, such that two thirds of physicians are specialists.

Impact of Managed Care

Managed care has greatly influenced the practice of medicine. Managed-care organizations such as health maintenance organizations (HMOs) and preferred provider organizations (PPOs) were the preferred choice of employers and the government in the 1980s as a means to contain the costs of healthcare. Managed-care organizations either contract with physicians or directly employ them. They use three principal types of payments: (1) payments to preferred providers with discounted fee schedules, (2) capitation payments, and (3) salaries. The consequence is that these organizations exercise control over physicians by way of constraints on payments, and they tend to use a capitation or discounted rate payment scheme. This approach results in disincentives for physicians to refer patients to specialists and to limit inpatient hospital stays. The use of primary-care physicians as gatekeepers to specialty care has also jeopardized patient care by imposing barriers to specialty care. On the other hand, the managed-care organizations offer incentives to physicians depending on their productivity. Despite this, the objective of cost containment has not been realized since the wide-scale implementation of managed care. And healthcare costs continue to rise.

Future Implications

In 2009, there will be about 890,000 active physicians in the United States, or approximately 295 per 100,000 people. Future projections, however, indicate that there will be a growing national shortage of physicians. According to several reports, although the total number of physicians will increase, the demand for their services will outpace supply. Factors such as the accelerating rate of retirements of older physicians, the aging of the nation's population, with associated chronic medical conditions, and restrictions on the number of hours medical residents work will contribute to

the physician shortages. To prevent the shortage, there is a push to increase the enrollment of students in medical schools across the nation. While this is a feasible solution, its effects will not be realized in the short term, because it takes 12 to 15 years to train a physician. Also, financial factors complicate this issue and influence the number of students who apply to medical school. It is problematic that the costs of education have consistently risen against a background of decreasing physician reimbursement. With an average of about \$200,000 in educational costs incurred postgraduation, coupled with less return on the investment today as compared with the past, interest in medicine has declined and so have the number of applicants to medical schools. A more immediate solution to the shortage of physicians may be achieved by having a greater number of IMGs enter residency programs. Another possibility is the greater use of nonphysician practitioners (NPPs), who represent a large portion of health-care providers. Specifically, nurse practitioners (NPs) and physician assistants (PAs) are popular medical careers that can be helpful in combating the need for care in underserved areas at a lower cost, typically 40% less than the cost of a physician. NPs, who complete registered nursing degrees in addition to extended study, are able to write prescriptions in most states. PAs practice under the supervision of a physician and also tend to practice in primary-care fields. Pooling resources from multiple areas, including more domestic medical graduates and IMGs, along with the greater use of NPPs, will help to equilibrate the imbalance between physician supply and demand and also promises to help with the problem of geographic and specialty maldistribution.

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See also American Medical Association (AMA); American Osteopathic Association (AOA); General Practice; Managed Care; Medical Group Practice; Physicians, Osteopathic; Physician Workforce Issues; Primary Care Physicians

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- American Medical Association (AMA): <http://www.ama-assn.org>
- Association of American Medical Colleges (AAMC): <http://www.aamc.org>
- Bureau of Health Professions (BHP): <http://bhpr.hrsa.gov>

PHYSICIANS, OSTEOPATHIC

There are currently about 61,000 osteopathic physicians in the United States; they constitute about 7% of the nation's practicing physician workforce. But osteopathic physicians are responsible for

16% of patient visits in small communities with populations of fewer than 2,500 individuals. In addition, 22% of all osteopathic physicians practice in rural and medically underserved areas.

The osteopathic medical philosophy emphasizes preventive care and focuses on the unity of all body parts. Instead of just treating specific symptoms or illnesses, osteopathic physicians regard the body as an integrated whole, and they help patients develop attitudes and lifestyles that help prevent illness. Like allopathic physicians, osteopathic physicians are fully licensed to prescribe medications and practice in all medical specialty areas, including surgery.

Osteopathic physicians also receive extra medical training in the musculoskeletal system, the body's interconnected system of nerves, muscles, and bones that make up two thirds of its body mass. This training provides osteopathic physicians with a better understanding of the ways that an injury or illness in one part of the body can affect another.

Furthermore, osteopathic physicians incorporate osteopathic manipulative treatment into their medical care. With this treatment, osteopathic physicians use their hands to diagnose injury and illness and to encourage the body's natural tendency toward good health.

Background

Andrew Taylor Still (1828–1917) was the father of osteopathic medicine as well as the founder of the first college of osteopathic medicine. Born in a log cabin in Jonesville, Virginia, Still decided at an early age to follow in his father's footsteps and become a physician. As an apprentice physician to his father, he learned both from being at his father's side as well as from the course of study. Still later served in the Civil War as a surgeon in the Union Army.

It was not until the early 1870s that Still separated himself from his allopathic counterparts by his pervasive criticism of the misuse of drugs common in that day. Believing that medicine should offer the patient more, he supported a philosophy of medicine different from the practice of his day, and in its place he advocated the use of osteopathic manipulative treatment.

Still identified the musculoskeletal system as a key element of health and recognized the body's

ability to heal itself. He stressed preventive care, eating properly, and keeping fit. In 1892, Still founded the American School of Osteopathy, now known as the Kirksville College of Osteopathic Medicine of the A. T. Still University of Health Sciences, in Kirksville, Missouri.

Osteopathic Medical Education

Currently, there are 26 osteopathic medical schools in the United States. Students in these programs take courses in anatomy, physiology, microbiology, histology, osteopathic principles and practices, including osteopathic manipulative medicine, pharmacology, clinical skills, physician–patient communications, and systems courses that focus on each major system of the body, such as the cardiac and respiratory systems.

Many osteopathic medical schools have students assigned to work with physicians beginning early in their 1st year of study. This process continues throughout the 2nd year in conjunction with the necessary science courses. In the 3rd and 4th years, osteopathic medical students spend time learning about and exploring the major specialties in medicine through clinical rotations.

One unique aspect of the osteopathic medical student's education is how these rotations are conducted in community hospitals and physicians' offices across the nation. Because few osteopathic medical colleges have their own hospitals, the schools partner with community hospitals to deliver the final years of curriculum as well as internship and residency training. This model of medical education developed by the osteopathic medical profession has been touted as the new model for all medical education. Current pilot studies are being developed on a national level to evaluate this model of medical education.

Medical Licensure

Licensing boards in each state provide osteopathic physicians with licensure to practice medicine. Requirements vary by state, but there are generally three ways an osteopathic physician can become licensed. First, osteopathic physicians must successfully complete a medical licensing

examination administered by the state licensing board. State boards may prepare their own examination or administer an examination that has been prepared and purchased from a specialized agency. Today, the United States Medical Licensing Examination (USMLE) and the Comprehensive Osteopathic Medical Licensing Examination (COMLEX-USA) are the most widely used tests. The osteopathic physician can also accept the certificate issued by the National Board of Osteopathic Medical Examiners (NBOME), awarded after an applicant has satisfied the requirements, including the successful passage of a rigorous series of tests. Finally, licensure can be granted through reciprocity or endorsement of a license previously received from another state. This typically has to be issued on the basis of a written examination.

Future Implications

Osteopathic physicians are one of the fastest growing segments of healthcare professionals in the nation. By the year 2020, an estimated 100,000 osteopathic physicians will be in active medical practice. Approximately 60% of all practicing osteopathic physicians specialize in the primary-care areas of family practice, internal medicine, obstetrics and gynecology, and pediatrics. Many of these physicians will continue to fill a critical need by practicing in rural and medically underserved areas of the nation.

American Osteopathic Association

See also Access to Healthcare; American Osteopathic Association (AOA); Health Professional Shortage Areas (HPSAs); Health Workforce; Physician Workforce Issues; Physicians; Preventive Care; Primary Care

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 Bureau of Health Professions (BHPr): <http://bhpr.hrsa.gov>
 Bureau of Labor Statistics (BLS): <http://www.bls.gov>

PHYSICIAN WORKFORCE ISSUES

The rate of change throughout the healthcare industry has had profound effects on the composition of the physician workforce. Yet while many health services researchers study issues involving the physician, including healthcare insurance and managed care, quality of care and outcomes, and malpractice and tort reform, direct evidence of changes in the physician workforce is relatively scant. Researchers, however, are able to use information from the studies that do exist to help develop efficient and effective healthcare management and policy.

Nature and Function of the Physician Workforce

More than 15 centuries ago, the Greek physician Hippocrates advocated that all physicians pay attention to the individual patient. In this rebellion against the Cnidian convention that favored diagnosis and classification of diseases, Hippocrates modernized the practice of medicine. While the physician has historically trained as an apprentice and basic responsibilities have remained the same over time, the physician is no longer simply someone who is a skilled healer. Today's physician is a healer who is formally trained—and legally qualified—to practice medicine. More stringent standards have existed only since the early 20th century, when Abraham Flexner's report on the status of medical education in North America

largely resulted in the advent of scientifically based university medical schools and teaching hospitals similar to those that had been established in Europe.

The physician workforce is presently composed of individuals educated and trained in primary care and various specialties. A primary-care physician is a Medical Doctor (MD) or Doctor of Osteopathic Medicine (DO) who, as a generalist, serves as the patient's first entry point into the healthcare system; a specialist physician is one who is qualified to diagnose and care for specific ailments or injuries. Physicians also may choose to practice in surgical specialties, which include the branches of medicine that treat injury or disease by operative procedures, or medical specialties, which include the branches of medicine that deal with nonsurgical techniques.

Various specialty boards, recognized by the American Board of Medical Specialties (ABMS) and the American Medical Association (AMA), individually certify physicians as specialists based on specific requirements, such as training, examination, and continuing education. Recognized specialties include the following: Allergy and Immunology, Anesthesiology, Colon and Rectal Surgery, Dermatology, Emergency Medicine, Family Practice, Internal Medicine, Medical Genetics, Neurological Surgery, Nuclear Medicine, Obstetrics and Gynecology, Ophthalmology, Orthopedic Surgery, Otolaryngology, Pathology, Pediatrics, Physical Medicine and Rehabilitation, Plastic Surgery, Preventive Medicine, Psychiatry and Neurology, Radiology, Surgery, Thoracic Surgery, and Urology. A majority of the specialties also acknowledge various subspecialties.

Many factors influence the choice of specialization as well as the choice to pursue a career in medicine. These factors become more defined as the individual's career, status, and function change over time. Among these factors are career opportunities; academic opportunities; practical experience during medical school; role models or mentors in the specialty; length of training required; lifestyle and work hours, especially during residency; likelihood of obtaining a residency position; concern about loans and debt; call schedules; post-training lifestyle, work hours, and financial rewards; intellectual challenges; interactions with patients; potential patient demographics; and

within-specialty gender distribution. Medical students also have expressed that receiving early exposure to positive role models and opportunities in a certain specialty is likely to influence their career pursuits in that specialty.

At the same time, lifestyle issues are increasingly and conclusively central to career choice decisions of medical school students. Measuring the determinants of specialty choice and overall satisfaction among generalists and specialists in different types of workplaces and organizations also requires the consideration of various factors, including possible postponement of family plans. And as the physician workforce experiences the introduction of younger professionals and the development of new opportunities for older ones, there is an increased need to consider the availability of role models and mentors, gender demographics, assurance in expressing emotions at work, development of personal relationships, parenthood during residency, family plans, and geographic location—all of which act as important factors in choices made by physicians throughout their careers. That is, the manner in which physicians view quality of life, both at work and at home, is of increasing importance when considering issues in and of the physician workforce.

Work Conditions

Although the majority of physicians continue to work in private offices or clinics, typically assisted by a small staff of nurses and administrative personnel, the professional lives of American physicians are increasingly—and almost entirely—being defined by group practice relationships and health maintenance organizations (HMOs). The HMO model, originated by Kaiser Permanente, is vertically integrated to link financial concerns with healthcare delivery and horizontally integrated to connect healthcare services, with the intent of providing continuity of care to patients who are members. This healthcare delivery structure is also designed to reduce scheduling and administrative by using a team approach to coordinating patient care. The model does, by definition, however, decrease the amount of independence solo practitioners experience by increasingly centralizing power within the organizational hierarchy.

Such organizational structures have had a significant impact on physician working conditions. Where excessive workloads, professional- and personal-time demands, and interpersonal communication hassles have long contributed to physician dissatisfaction at work, there are strong indications that HMO and other managed-care physicians base work satisfaction on a combination of professional expectations and characteristics of the workplace as well as whether they are working for one managed-care organization or more. As with physicians in other practice types, these physicians' satisfaction is based on the extent of autonomy, administrative issues, resources, work-related relationships, and the amount of time allotted to visit with patients. In keeping with Max Weber's early-20th-century analyses of bureaucratic organizations as fundamentally impersonal and constraining of individuals' behaviors, managed-care physicians increasingly report less job satisfaction as compared with nonmanaged-care physicians. The enjoyment that they individually sense in their daily work or career, however, is contingent on whether the physicians can accept the differences between work in the context of managed care and prior to its arrival.

Adaptation to the Work Milieu

Federal and state governments have taken interest in regulating the number of medical resident work hours, in response to growing public concerns over medical errors and the national Institute of Medicine's (IOM) seminal report, *To Err Is Human*. Although there is no conclusive evidence of a significant relationship between medical errors and the number of hours worked, the reduction in medical resident work hours has affected educational, practical, and patient care experiences. There is also a focus in government institutions and public and private organizations on modernizing information technology systems used by healthcare providers in ways that align with the implementation of service-outcome and quality improvement programs.

To further understand physicians' motivation to act on issues in the work environment, there must be an account of concerns over capitation-based income, negotiability of other work incentives, and whether physicians have autonomy when arranging work

schedules and the like. But physicians have also cited decreased control over medical decisions, decreased control over referral processes, the proliferation of malpractice lawsuits, ethical concerns due to managed-care arrangements, federal Health Insurance Portability and Accountability Act (HIPAA) compliance requirements, and reduced income as reasons for diminished satisfaction at work. Where these effects of managed care may be interpreted or overinterpreted by any human being as an affront to personal self-image, they may have a consequent effect on how physicians view their work environments and how they perform in them.

Time and Money

Irrespective of the type of organization or environment in which a physician practices medicine, the amount of time a physician spends at work may exceed an average of 60 hours per week, especially during medical residency. Physicians who are on call also have to contend with patients' concerns over the telephone and have to prepare to make emergency hospital visits; the emergence of e-mail as a physician-patient communication channel has also had an impact on physicians' time considerations. These considerations have emerged on top of the expansion of managed care, which has arguably had an adverse effect on the quantity and quality of time physicians can dedicate to patient care.

The requisite time commitments provide challenges in scheduling individually desired work shifts. In instances where physicians negotiate new and more flexible schedules, coworker resentment can emerge. Thus, physicians and the organizations for which they work are discovering that they have to amicably determine some form of compensation when desired schedules cannot be realized.

One potential trade-off to the amount of time spent in professional activities is the income generated by most physicians. The latest reports on physician distribution from the American Medical Association (AMA) and the U.S. Department of Labor (DOL) indicate that almost 900,000 active physicians in the United States practice professional activities in hospital-based, office-based, and academic medical settings. The number of physicians spread across these diverse practice settings, combined with an increasingly consumerist

healthcare system, are a cursory signal of the market forces that facilitate physician income streams. With incomes generally holding across the six-figure range, medicine remains one of the highest paid professions in the nation.

Yet physicians report that their service commitment is disproportionate to the financial reward. Physicians are seeing more patients, or have simply had to increase the price of their services, in an effort to keep pace with rising operational costs and the rate of inflation. This development runs in line with a public perception that physicians seek a “target income” that is accomplished through their increasing the volume of services. Plus, the relative disparity in income between specialists and primary-care physicians and the variability of income across the profession, combined with the implications of managed care, government reform, and the economy in general, have conceivably led many physicians to seek alternative sources of remuneration.

Malpractice and Tort Reform

Among the healthcare issues that further affect physician income is the current condition of medical malpractice litigation in the nation. The original intent of medical malpractice litigation, which first materialized in the nation during the 19th century, was to safeguard patients against sham or hazardous medical practices and to equitably compensate patients injured by such practices. Over time, and despite the medical profession having become more regulated, the per-person cost of malpractice litigation in the United States is proportionately more than that in any other country in the world. The considerable number of plaintiffs in medical malpractice cases who have received multimillion-dollar monetary awards has led to a widespread assertion that there is a national malpractice crisis. This crisis has in turn caused a great number of professionals in the healthcare field to share the belief that malpractice litigation has surpassed reasonable levels and that some correction is overdue. The concomitant fallout has profoundly affected the medical profession.

Physicians have recently experienced enormous changes with regard to professional liability insurance. These circumstances have been attributed to a systemwide failure to adopt tort reform that includes caps on noneconomic damages. This view

has been contrarily refuted by scores of plaintiff attorneys and like-minded advocacy groups. Increases in malpractice insurance premiums have nevertheless reached a point where many physicians have considered practicing without malpractice insurance coverage, while others have difficulty obtaining insurance—in some cases despite having never faced a claim. Coverage from many insurers has now become cost-prohibitive. The existing malpractice conundrum has thrown professional practices into a state of confusion.

Physicians generally function on the basis that a majority of the litigious claims are erroneous allegations made by patients whose medical cases resulted in negative outcomes. To whatever extent this belief is true, malpractice claims seem to be in large part contingent on the physician–patient relationship and how actively engaged the patient judges the physician to be when communicating during office, clinic, or hospital visits. Although effective communication between the physician and the patient is an obvious means toward reducing liability, the sheer number, financial and reputation costs, and jury awards associated with malpractice suits brought against physicians have also significantly contributed to a shift in the way physicians practice medicine.

In an attempt to avoid litigation, some physicians are said to be practicing defensive medicine, whereby patient care decisions are predicated more on reducing the physician’s liability risk than by what treatments may be considered accurately in the best interest of the patient. For example, physicians may feel compelled to order excessive tests, treatments, and services and may even avoid certain high-risk procedures and entire specializations altogether for fear of being sued for malpractice. As physicians increasingly diminish the types of procedures they are willing to perform and find their incomes being reduced by rising malpractice fees, a palpable cascade effect affects the delivery of care to patients. The decrease in income and decision-making opportunities may further help explain why physicians have been seeking out and clinging onto the vestiges of their autonomy and self-esteem.

Also striking is the finding that younger physicians are likely to seek a job as opposed to wanting to establish a practice. This trend may be due to a movement away from the less-satisfying,

productivity-based compensation of private practice, which has long been a risky but lucrative system for medical professionals. Even though production-based compensation leads to increased productivity among physicians, physicians have reported being satisfied when an emphasis is placed on quality of care and dissatisfied when productivity is emphasized in their work. This finding echoes earlier conclusions that time pressure may lead to suboptimal work performance and overall satisfaction levels, which lead to potential compromises in patient care. In today's healthcare system, the amount of time a physician spends with a patient or on a given task is regulated to an extent by the size and structure of the organization in which the physician works.

Demographic Changes

A number of economic factors have clearly influenced change throughout healthcare. Yet the central management concern in healthcare lies in two significant social transformations that have occurred with a minimum of attention: The older generation of physicians assert different expectations about their work as compared with the younger generation; and the physician workforce in the United States, which before the last quarter or third of the 20th century had been male dominated, is now becoming female dominated.

Many of the age-based changes may be seen in the contrasts between baby boomers, born between 1946 and 1964, and Generation X-ers, born between 1965 and 1981. Within the medical profession, baby boomers and the first half of Generation X comprise upward of 60% of the physician workforce, while the latter half of Generation X accounts for slightly less than 20% of the total. Physicians of the baby boomer generation experienced enormous practice management changes throughout their careers. They most likely began and spent most of their careers in private practice as solo practitioners or in small groups but are now likely to be employed by or associated with a large healthcare organization. Yet they may assert a sense of confidence about their work and are often accused of caring more about their work than their lives outside work. They convey satisfaction in their jobs because they are often at a point in their careers where they are given opportunities

to voice their opinions and make high-level decisions. And practicing medicine has provided a respectable level of affluence for most of them because of less-stringent economic constraints on medicine during the early and middle years of their careers. But younger physicians have entered the field during a time when medical-practice management has been increasingly enveloped by the bureaucratic systems of managed care.

Another change is that women now account for about half of all medical school applicants; 35 years ago, they comprised less than 1/10 of the applicant pool. While this shift may well alter the physical image of the physician in the popular imagination, the increasing number of women in the workforce has already changed things. Chief among the changes has been the growth in the number of women who join the physician workforce and who also continue to involve themselves in traditional roles at home, which has been the motive behind flexible work schedules. Female physicians born between the early 1960s and as late as 1980 were among the first physicians to demand flexibility and variety in their schedules. When these requests were accommodated by administrators, male physicians of the same generation requested similar elasticity in their schedules, and then so, too, did more senior physicians.

Information about physicians' attitudes toward work and home life is becoming more focused on illuminating physician-specific healthcare-related trends and could be integrated into plans to improve individual and organizational performance abilities and functions.

Physician Supply

There are now indications that the United States will face a shortage of physicians in the coming decades. Reasons for this supply shortage include the following: (a) the overall growth of the nation's population, (b) an increased demand for physicians' services due to economic expansion, (c) an increased demand for more medical care by aging baby boomers, (d) an increase in performance of physicians' services by nonphysician clinicians who will need to be supervised, (e) an increase in malpractice insurance premiums and concomitant legal issues, (f) insurance carriers that dictate practice methods and income, (g) salaries that lag behind

the rising rate of inflation, (h) the retirement of practicing physicians, (i) a decline in physician work effort, (j) the suddenly low number of applications to medical schools, and (k) geographically dependent lifestyle effects. As the composition of the physician workforce continues to change, and with it ideas about the length and meaning of work, questions abound as to how positions will be filled throughout the workplace.

Future Implications

Contemporary healthcare facility and medical school administrators must contend with challenges related to physician recruitment and retention, especially as the U.S. population consumes more healthcare as it moves through midlife and into old age. But complex social, economic, political, organizational, and individual factors have influenced the creation of new institutions throughout healthcare. To understand and capably manage the new aims, physicians and their employers, patients and their advocates, politicians, and the press will have to examine all facets of the physician at work. It is physicians who on a daily basis participate in healthcare more than any other stakeholder, which means that they are a valid point from which to assess the thoughts and behaviors of the people, organizations, and systems that have an impact on healthcare.

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See also American Medical Association (AMA); Association of American Medical Colleges (AAMC); General Practice; Malpractice; Medical Group Practice; Physicians; Primary-Care Physicians

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- American Medical Association (AMA):
<http://www.ama-assn.org>
- Association of American Medical Colleges (AAMC):
<http://www.aamc.org>
- Council on Graduate Medical Education (COGME):
<http://www.cogme.gov>

PREFERRED PROVIDER ORGANIZATIONS (PPOs)

A preferred provider organization (PPO) is a healthcare delivery system where providers contract with the PPO at various reimbursement levels in return for patient steerage into their practices and/or timely payment. PPOs differ from other healthcare delivery systems in the way they are financed as well as by providing more choice, benefit flexibility, and enrollee access to providers and medical services both in and out of network.

History

While PPOs have been in existence in some form or another for decades, the development of modern

PPOs was the result of key legislative actions at the state and national level. In the 1970s and 1980s, many states passed enabling legislation to specifically allow for the development of PPOs. In 1974, the U.S. Congress enacted the Employee Retirement Income Security Act (ERISA). A very small portion of this law gave Taft-Harley Funds and other organizations the right to self-insure their healthcare benefits. Under the new law, organizations that self-insured would not be subject to various state coverage mandates or to state premium taxes; instead, they were now free to develop employee healthcare benefit programs. Recognizing the unique opportunity, third-party administrators began providing some or all of the services required by the self-insuring companies.

As a rule, however, these third-party administrators did not develop their own delivery networks and instead looked to another fledgling group of companies—preferred provider organizations—to credential and supply networks of physicians and healthcare institutions. Insured products grew and employers and other purchasers came to see PPOs as the middle ground between health maintenance organizations (HMOs) (traditionally lower cost but more restrictive) and indemnity insurance plans (permissive but more expensive). This fueled the development of local PPO organizations in the 1970s and 1980s and—beginning in

the 1990s—encouraged the expansion of a limited number of national PPOs. The growth in PPO plan enrollment at the expense of traditional indemnity insurance and point of service plans is shown in Figure 1.

Today PPOs are tremendously popular. Over the past few years, there has been a consolidation of the PPOs marketplace resulting in fewer regional PPOs and larger national plans as regional plans merge or are bought by larger national plans.

In 2007, more than 158 million individuals were enrolled in a PPO program, which represents 64% of all Americans with healthcare coverage. One reason for this strong market share is that PPOs have delivered what the public has called for: choice, flexibility, and a balance between delivery of appropriate care and cost control.

Characteristics and Types of PPOs

There are two basic types of PPOs: a nonrisk PPO and a risk PPO. A nonrisk PPO's primary focus is to contract with providers in a geographical area to form an interconnected network of providers and services. The nonrisk PPO network leases and/or "rents" its network for a fee to insurance companies, self-insured employers, union trusts, third-party administrators, business coalitions, and associations. In contrast, a risk PPO assumes the financial risk for an enrollee's healthcare costs.

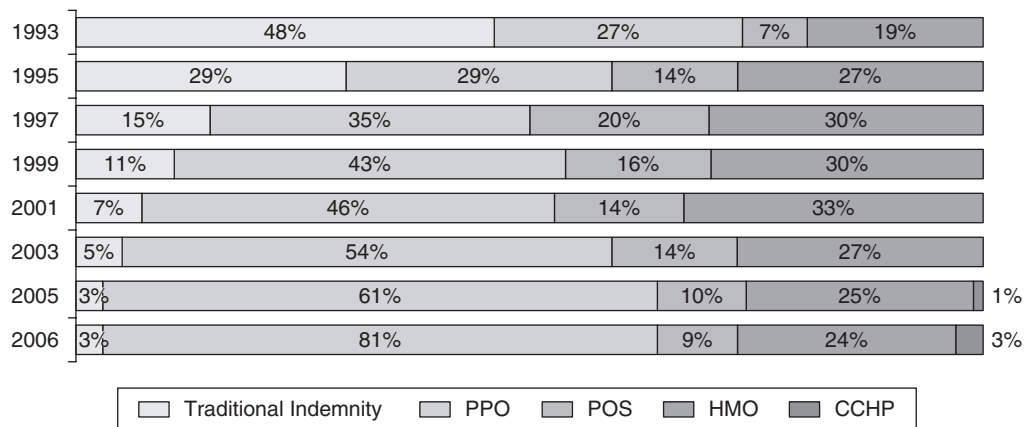


Figure 1 A Comparison of Medical Plan Enrollment, 1993 to 2006

Source: Association of Preferred Provider Organizations (2007).

Traditionally, insurance companies offer a risk PPO that includes a benefit plan and network services either provided by the risk PPO or leased from a nonrisk PPO.

Insurance companies own most PPOs. They are also owned by hospitals, hospital consortiums, individual entrepreneurs, and private equity groups.

Enrollees in PPOs typically have benefit plans that provide both in-network and out-of-network coverage. Enrollees who seek care from providers within the PPO network receive in-network coverage, generally at a greater benefit level or lower coinsurance or copayment. Enrollees may still seek care outside the PPO network, but the benefit level is usually lower, and the enrollee may incur additional costs due to balance billing from the nonnetwork provider. Enrollees can choose, each time they seek care, to use an in-network or out-of-network provider. PPOs benefit enrollees by supporting their need to take a more active role in their healthcare.

PPOs also benefit providers. The financial considerations of the PPO healthcare delivery model do not override patient care decisions but rather work in conjunction with PPO providers in delivering patient care.

Claims from providers are usually handled in several ways. The PPO can give access to its fee schedule to the claims-paying entity. This is often done by providing a computerized record of the payment amount. If the PPO does not share its fee schedule with the payer, the PPO usually reprices the claims and then sends them to the payer, which pays the bill. Claims from hospitals and professional providers are sent to the PPO. The PPO adds information to each claim about the fees that should be used to process the claim. The fee information includes the PPO's negotiated and contractual rate. The claims are then sent to the paying entity (HMO, insurance company, third-party administrator) for processing. Of course, some PPOs pay claims for all providers as well.

In addition to comprehensive network PPOs, some PPOs are dedicated to specialty networks. Specialty network PPOs facilitate and support the delivery of specialized healthcare services, such as dental, vision, chiropractic, radiology, behavioral health, and other areas. Often, these types of providers have unique reimbursement and benefit issues.

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See also American Association of Preferred Provider Organizations (AAPPO); Employee Retirement Income Security Act (ERISA); Healthcare Financial Management; Health Insurance; Hospitals; Managed Care; Physicians

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Web Sites

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- America's Health Insurance Plans (AHIP): <http://www.ahip.org>
- Joint Commission: <http://www.jointcommission.org>
- National Committee on Quality Assurance (NCQA): <http://www.ncqa.org>

PRESCRIPTION AND GENERIC DRUG USE

The pharmaceutical industry in the United States represents a multibillion dollar a year enterprise that has helped fuel increasing healthcare costs. In 2006, America's spending alone on drugs increased to over \$250 billion, accounting for more than

41% of worldwide expenditures. New foreign markets, primarily in Asia, have seen more drastic annual expenditure increases than the United States, however. Reasons cited for the increase in drug expenditures include the introduction of new, more expensive drugs to the marketplace, a population that is aging and requiring more pharmaceuticals for disease management, increasing prices on the manufacture of existing drugs, and the use of drugs as a substitute for other forms of healthcare services.

Historically, the pharmaceutical industry has grown with the development of new drugs, new drug therapies, and the expansion of medical knowledge and practice. This expansion has required an increased focus on new drug efficacy and safety. Tighter government scrutiny and control have been realized through the Prescription Drug Marketing Act of 1987 and the U.S. Federal Drug Administration (FDA) approval process. Many, especially within the pharmaceutical industry, view the FDA's approval process as prohibitive; others view it as necessary to ensure public safety. The length of the approval process delays a drug's entry into the marketplace and quite possibly drives the developmental costs upward. It is estimated that the total development costs for a new drug in the United States, including losses to nonapproval of previous drugs, is around \$1 billion each year. The accepted estimate is around \$860 million per new medication developed, although some recent estimates put development costs at somewhere between \$500 million and \$2 billion per new drug. Companies try to recoup these costs as quickly as possible, which leads to higher prices when the drugs arrive on the marketplace for use by the public.

Although pharmaceutical companies typically receive a 20-year patent on the new drugs they develop, the FDA approval process may take as long as 12 years in and of itself. This lengthy period considerably reduces the effective income-producing potential of any new drug produced. Because of the shortened brand name shelf life for a drug, the companies must make profits within a relatively short amount of time. When the patent expires, other companies may produce the drug in its generic form. Generic drugs represent a cheaper alternative to the branded versions of the drug when released by the companies.

This entry presents an overview of the 12-step FDA approval process and discusses orphan and generic drugs. Then, this entry discusses the factors associated with those who use prescription drugs. Next, the prescription drugs' cost dilemma is addressed; and last, future implications are considered.

The FDA Approval Process

Once a pharmaceutical company has developed a new drug, the company must apply to the FDA for approval to market and sell the drug. The FDA process involves 12 steps, beginning with animal testing. This is designed to increase the size of clinical studies until the drug has been proven to have the desired effect while being safe.

Animal testing, referred to as preclinical testing, involves establishing the efficacy of the drug before it is given to humans. Many new drugs are stopped at Stage 1 because the FDA has not deemed the drugs reasonably safe for human usage because of their side effects or their lack of desired effect on the animals tested.

If the drug shows promise and is considered safe for further testing, a protocol for human testing is developed and must be approved by a local institutional review board (IRB) and the FDA in Stage 2. The IRB is composed of scientists and researchers who must determine whether human subjects are adequately protected from possible negative outcomes. It also determines whether the study is scientifically acceptable. This stage represents the company's proposal for clinical trials, involving human subjects, of the new drug.

Once the protocol is established and approved by the IRB, the company may move on to Stage 3 of the process. Stage 3 includes what is generally referred to as Phase 1 clinical trials. Phase 1 studies involve testing the drug on a small group of human subjects. The size of the group is generally between 20 and 80 healthy volunteers. The observance and notation of negative or frequent side effects of the drug is particularly important during Phase 1. If significant side effects are not detected, Phase 2 clinical trials may begin. Occasionally, alternative uses for a drug may be uncovered at this stage. That is, it is possible that a side effect may have a significant impact on another medical condition. An example of such unintended uses of a drug is

the case of AZT. AZT was originally developed as an anticancer drug in the 1960s, but its trial results were disappointing. Twenty years later, AZT was discovered to be a viable treatment for HIV/AIDS.

Phase 2 studies, Stage 4 in the FDA approval process, increase the size of the subject panels from several dozen to a few hundred participants. The focus of Phase 2 clinical trials shifts from the safety focus of Phase 1 trials to a focus on effectiveness. Safety is continually monitored, though. Rather than testing on healthy individuals, Phase 2 trials use volunteers with the condition that the drug attempts to alleviate. These studies often involve the use of cohorts comparing the effectiveness of the drug to a placebo. A cohort study represents a type of epidemiological approach to investigating the incidence and prevalence of disease across a fixed population group over time. Investigators compare outcomes between a group of individuals who have a risk factor believed to be associated with the outcome to a group without that factor. Cohort studies can be conducted prospectively or retrospectively, but the concept of control is extremely important to determining a drug's efficacy.

Should the evidence from the Phase 2 clinical trials point to the drug's safety and effectiveness, the pharmaceutical company moves its application to Stage 5 of the approval process. In Stage 5, Phase 3 clinical trials include a larger number of participants, usually up to a few thousand subjects, and they continue to scrutinize the safety and effectiveness of the drug. On successful completion of these drug trials, the process moves to Stage 6.

Stage 6 is sometimes referred to as the pre-New Drug Application, or pre-NDA, stage. At this point in the approval process, drug company representatives meet with FDA representatives to review the proposed product. If it is determined safe and effective, the pharmaceutical company moves to the next stage of the process.

Stage 7 involves the submission of the New Drug Application (NDA) to the FDA. The NDA represents a formal request from the pharmaceutical company for the FDA's approval of the drug. The FDA has 60 days to decide whether to consider approval. The agency's decision itself is considered Stage 8 of the overall process. A positive decision leads the FDA to file the application as Stage 9. It also assigns a team to evaluate the evidence collected from the three phases of the clinical trials.

In Stage 10 of the FDA approval process, the focus is on the review of the proposed labeling of the drug. The FDA ensures that the patient instructions are clear and understandable. Its review team also visits the pharmaceutical company's production facilities and evaluates its processes to ensure quality control in Stage 11.

Finally, in Stage 12 of the process, the FDA reviews all submitted evidence and documentation. The agency arrives at a final decision of "approvable" or "not approvable." Assuming that the data indicate an acceptable risk and demonstrable benefit, the drug is ready for manufacture and sale.

The length of time between drug development and sale is obviously long. For drugs that can potentially save patients with immediate and life-threatening conditions where no drug currently exists, the FDA may allow the company to engage in an accelerated approval process. This more expedient process involves using "surrogate endpoints" or alternative data to establish the drug's efficacy. In some cases, the larger Phase 3 clinical trials may be waived based on the promise of data from the smaller Phase 2 trials. Accelerated approval, however, is relatively rare. It tends to be used on drugs developed to treat diseases with very poor projected outcomes where other treatments have been shown to be ineffective. Most recently, drugs used to treat HIV/AIDS have been approved through an accelerated process because the benefits of the drug to patients are deemed to outweigh the risks when the disease is terminal.

The entire FDA drug approval process is designed to ensure the public's safety and its confidence that these drugs achieve the results that the pharmaceutical companies maintain. It is long, arduous, and expensive to the developers of new pharmaceuticals. Even then, however, it is still possible that long-term negative effects may surface at a later date, necessitating a change in the FDA's initial ruling. Therefore, even after a drug has obtained FDA approval, it is continuously monitored for safety. This postapproval safety monitoring may cost the pharmaceutical industry an additional \$50 million annually.

Orphan Drugs

Although the FDA approval process is clearly intended to protect the public's interest and

guarantee their safety, it can become cost-prohibitive for pharmaceutical companies to use their resources to develop drugs for conditions that affect a relatively small number of patients. Relatively rare diseases are sometimes referred to as orphan diseases. Similarly, drugs developed to treat such diseases are called orphan drugs. Orphan drugs have received special federal regulations that allow for a 7-year monopoly on the production of the drugs as well as tax reductions. The orphan drug rules are in effect for diseases that affect fewer than 200,000 people in the United States.

Generic Drugs

A generic drug is a prescription drug that is produced and sold without a brand name. Once the patent for a drug expires, companies may make generic versions for sale to the public. Generic drugs are generally less expensive than their branded counterparts, primarily because they are not advertised and because of increased competition among pharmaceutical companies. Many health insurance companies encourage their beneficiaries to use generic equivalents whenever possible because they provide significant cost savings. The Congressional Budget Office (CBO) estimates that generic drugs save consumers between \$8 and \$10 billion annually.

If a pharmaceutical company wishes to sell a drug as a generic, it must file an abbreviated new drug application with the FDA prior to introducing it in the marketplace. The company must demonstrate that the generic version of the drug is identical to the brand version in order to obtain FDA approval to sell the drug. Not only must the generic version be chemically identical, but the same strict manufacturing procedures previously adhered to for the brand version must also be used to make the generic version of the drug.

Some health insurance companies require the substitution of a generic equivalent to be covered. Patients who request not to receive a generic drug may have to pay the additional cost out of pocket. Not all drugs have generic counterparts, however. Presently, only around 50% of brand name drugs have generic equivalents. Patients desiring a generic equivalent may ask their physician if an equivalent exists and whether a substitution is appropriate.

Prescription Drugs Users

As previously mentioned, age is an important factor in who uses prescription drugs. The National Center for Health Statistics (NCHS) reports that nearly 85% of all Americans over the age of 65 had at least one prescription in the previous month and nearly 52% had three or more prescriptions. The percentage of those using prescription drugs increases steadily with age.

Gender also plays a significant role in prescription drug use. The data reported by NCHS indicate that a higher percentage of women use prescription drugs than do men across every age group except those under 18. Women are more likely than men to use prescription drugs across racial/ethnic groups as well.

Whites, for both men and women, are the most likely to use prescription drugs, followed by African Americans and Hispanics, respectively. Because access to prescription drugs is restricted, disparities in their use are similar to disparities in healthcare resulting from different levels of access to physician services and medical care.

Prescription Drug Cost Dilemma

The widespread use of generic drugs represents one way in which consumer costs can be reduced. Generic drugs are lower in price because they do not incur a number of the high costs associated with brand name drugs. First, there are no new research and development costs. Once a patent expires on a brand name drug, pharmaceutical companies can make generic equivalents through a reverse engineering process. Second, they do not have marketing costs. Generic equivalents tend to benefit from previously marketed brand drugs. In addition, companies tend not to provide free samples of generic drugs to physicians. Third, generic drugs do not have the costs associated with the 12-stage FDA approval process; rather, they only have to demonstrate the biochemical equivalence of the brand version. Finally, because multiple drug companies can sell generic equivalents after the patent expires, there is greater competition, which results in lower costs to the consumer.

The elderly have been especially affected by spiraling drug costs because they often live on a lower, fixed income than younger cohorts, and

older adults use prescription drugs more frequently. In 2003, the federal government enacted the Medicare Prescription Drug, Improvement, and Modernization Act, which is generally referred to as Medicare Part D, to assist the elderly in accessing necessary prescription drugs in a more cost-effective manner. Medicare Part D was implemented in 2006 and allowed eligible elderly and disabled Medicare patients to select enrollment into one of a set of government-approved private prescription plans.

Different approved prescription drug plans tend to cover different drugs. An early complaint from Medicare recipients about the selection process was that it was too complicated. The enrollee is expected to make a plan choice by matching a list of the prescriptions they receive against the lists of approved drugs and their prices to arrive at the most cost-effective choice given their personal situation. After initial problems, however, the process has gone considerably more smoothly. Revenues from Medicare Part D premiums are expected to be nearly \$750 million by the year 2015.

Future Implications

The use, and the expense associated with that use, of prescription drugs has spiraled upward in the past and is likely to increase even more in the future. As this happens, efforts to make drugs more accessible will escalate. In some cases, this may mean that some prescription drugs may be made available over the counter if they have demonstrated very long-term efficacy and safety. This practice allows greater exposure and availability of the drug to a wider public consumer audience. It also typically reduces the unit cost because of higher expected sales.

The percentage of the population, adjusted for age, that has received at least one prescription has increased from 38% in the early 1990s to over 45% in the early 21st century. For the elderly, the increase is even more dramatic. Pharmaceutical companies strive to bring more and better drugs to the marketplace as part of their financial strategic plans. The net effect on the consumer and the physician is a wider selection of drugs that can be used to treat a wider array of conditions.

Ralph Bell

See also Cost of Healthcare; Inflation in Healthcare; Medicare Part D; Pharmaceutical Industry; Pharmacoeconomics; Pharmacy; Randomized Controlled Trials (RCT); U.S. Food and Drug Administration (FDA)

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- U.S. Food and Drug Administration (FDA): <http://www.fda.gov>

PREVENTIVE CARE

Preventive care is a set of measures taken before symptoms begin to prevent illness or injury. While the number of preventive services has expanded in recent years, particularly in the areas of cancer and ischemic heart disease, preventive care is still best exemplified by routine physical examinations and immunizations. The emphasis remains to prevent disease before it occurs. Physicians, nurses, and public health officials perform preventive services in various settings, including physicians' offices, clinics, health departments, and hospitals. Public and private health insurance plans generally pay for preventive services, and the literature and expert consensus agree that healthcare systems focused on preventive care are more cost-effective. A number of barriers to preventive care exist, and medicine, public health, and policymakers must work to eliminate them.

Background

While traditional preventive strategies of medicine and public health, such as routine physical examinations and immunizations, have been around for many years, the science of preventive care was first formalized with the establishment of the U.S. Preventive Services Task Force (USPSTF) in 1984. The task force, first convened by the U.S. Public Health Service (PHS) and since 1998 sponsored by the Agency for Healthcare Research and Quality (AHRQ), is the leading independent panel of private-sector experts in prevention and primary care. The task force ensures that the clinical guidelines for providing preventive care are evidence based. Specifically, the task force conducts rigorous, impartial assessments of the scientific evidence for the effectiveness of clinical preventive services, including health screening, counseling, and preventive medications. Its recommendations are considered the gold standard for clinical preventive services. The task force is made up of primary-care clinicians along with nurses. The task force evaluates the benefits of individual services based on age, gender, and risk factors for disease and offers recommendations that have formed the basis of the clinical standards for many professional societies, health organizations, and medical

quality review groups. Its work has established the importance of including prevention in primary care and prompted insurance coverage for effective preventive services.

Types of Prevention

Preventive care can be categorized into three levels: (1) primary, (2) secondary, and (3) tertiary prevention. Primary prevention services avert disease development and include population-based health promotion activities such as vaccination and safe water supplies. Secondary prevention services target early detection of asymptomatic disease with the goal of preventing the progression of disease (exemplified by the pap smear to detect precancerous cervical changes). Secondary prevention services may also include prophylaxis to reduce the chance of disease recurrence (e.g., aspirin, blood pressure control, and lipid-lowering medications for the secondary prevention of ischemic heart disease following an initial myocardial infarction, or heart attack). Tertiary prevention services reduce the impact of already established disease. Preventive care encompasses both therapeutic interventions, such as immunizations or antibody prophylaxis and diagnostic examinations that screen for early asymptomatic disease. Screening examinations often detect early disease at a point where interventions improve health outcomes.

Preventive-Care Services

The historical foundation of preventive care rests on routine medical history taking, physical examination, and healthy lifestyle counseling, but rapid advances in medical technology provide new devices and laboratory tests to screen for disease. Amid the rapid growth of preventive-care services, clinicians must decipher the evidence of each service. The USPSTF offers the most rigorous evaluation of preventive services and provides guidance for clinicians to make evidence-based decisions. The task force's *Guide to Clinical Preventive Services, 2007* provides recommendations on 58 services made from 2001 to 2006. These services are grouped into clinical categories, including cancer; heart and vascular diseases; infectious diseases; injury and violence; mental health conditions and substance abuse; metabolic, nutritional, and

endocrine conditions; musculoskeletal disorders; obstetric and gynecological conditions; pediatric disorders; and vision and hearing disorders.

The task force recommends that clinicians discuss the 58 preventive services, based on their strength of evidence, with their eligible patients. The services include the following: abdominal aortic aneurysm screening (one-time screening by ultrasonography in men 65 to 75 years of age who have ever smoked); alcohol misuse and behavioral counseling interventions (for men, women, and especially pregnant women); aspirin for the primary prevention of cardiovascular events (for men and women at increased risk for coronary artery disease); asymptomatic bacteriuria screening (for pregnant women); breast cancer (mammography every 1–2 years for women 40 years of age and older and discussion of chemoprevention in high-risk populations); breast and ovarian cancer susceptibility (genetic testing and counseling); promotion of breastfeeding (structured education and behavior counseling for pregnant women); cervical cancer screening (for women over 18 who are sexually active); chlamydial infection screening (for women 25 and younger and other asymptomatic women at risk of infection); colorectal cancer screening (for men and women 50 years of age and older); dental caries prevention (oral fluoride supplementation to preschool children in areas where water sources are deficient in fluoride); depression screening (for men and women within established clinical systems); diabetes mellitus (Type 2) screening in adults (for men and women with hypertension or hyperlipidemia); diet counseling (for adult men and women with hyperlipidemia and other known risk factors for cardiovascular and diet-related chronic disease); gonorrhea screening (for all sexually active women at increased risk for infection, including pregnant women); prophylactic gonorrhea treatment (including ocular topical medications for all newborns); hepatitis B virus infection screening (for pregnant women at first prenatal visit); high blood pressure screening (for adult men and women at all visits); HIV screening (for all adolescents and adults at risk for HIV infection and all pregnant women); iron deficiency anemia prevention (including routine iron supplementation for asymptomatic children 6–12 months of age who are at risk for iron deficiency); iron deficiency anemia screening (for asymptomatic pregnant women);

lipid disorder screening (for men 35 years of age or older and women 45 years of age or older, and for younger adults with other risk factors for coronary disease); obesity screening (including intensive counseling and behavioral interventions to promote sustained weight loss for obese adults); osteoporosis screening (for women 65 years of age and older and women 60 years of age or older who are at increased risk for osteoporotic fractures); Rh(D) incompatibility screening (including blood typing and antibody testing at the first pregnancy-related visit); syphilis infection screening (for persons at risk and all pregnant women); tobacco use and tobacco-caused disease counseling (including cessation interventions for those who use tobacco); and visual impairment screening (for children younger than 5 years of age to detect amblyopia, strabismus, and defects in visual acuity).

It should be noted that the task force did not make recommendations for newborn screening, which aims to identify treatable genetic, endocrinologic, metabolic, and hematologic diseases. It also did not address immunizations.

Immunizations

Immunization is the process in which the body develops a defense against foreign agents (e.g., bacteria, viruses, and fungi). Exposure to these foreign molecules prompts the immune response to protect the body. A hallmark of the immune system is its memory. After first exposure to most agents, the human body develops immunological memory, such that later exposure to the same agent will result in quick, efficient, and successful protection from the agent. A common example is the lifetime protection conferred to most people after infection with *Varicella* (chickenpox). It is this feature of the immune system that provides the basis for successful vaccines, which have become a cornerstone of public health and preventive care. Under typical conditions, immunizations expose the body to nonvirulent doses of foreign agents, enabling it to develop immunological memory, which confers lifetime protection to the specific agent. Since the original work of Edward Jenner in the early 19th century, biomedical research has developed many successful vaccines, of which many are given routinely to children and are considered compulsory for attending school.

Immunizations have led to worldwide eradication of smallpox and the dramatic decline in mortality and morbidity from diseases such as polio, measles, diphtheria, whooping cough, hepatitis B, and bacterial meningitis.

The Advisory Committee on Immunization Practices (ACIP), a branch of the Centers for Disease Control and Prevention (CDC), provides evaluation of the literature and offers evidence-based recommendations for immunization schedules for adults, infants, and toddlers, preteens and adolescents, college students and young adults, parents, pregnant women, healthcare workers, people with specific diseases/conditions, racial and ethnic populations, and travelers. The ACIP is composed of 15 experts who are selected by the Secretary of the U.S. Department of Health and Human Services (HHS). This committee provides advice and guidance to the Secretary, the Assistant Secretary for Health, and the CDC on the control of vaccine-preventable diseases. The committee develops written recommendations for routine administration of vaccines with the goal of reducing the incidence of vaccine-preventable diseases in the nation and ensuring safe use of vaccines. Under this guidance, immunizations remain one of the most valuable services of preventive care.

Providers

Primary-care physicians (i.e., internal medicine, pediatrics, family medicine, and obstetrics and gynecology), nurses, physician assistants, and nurse practitioners represent the majority of the clinicians who provide preventive-care services on a daily basis. They provide these services in various settings, including physicians' offices, outpatient clinics, public health departments, and hospitals. Importantly, these professions have incorporated preventive care into their missions of providing care and ensuring health among their patients.

While primary-care physicians provide the bulk of preventive services, as recommended by the USPSTF, the profession of medicine further formalizes and emphasizes preventive care through designated training in the specialty of preventive medicine. Preventive medicine is one of 24 medical specialties recognized by the American Board of Medical Specialties (ABMS). The specialty encompasses multiple population-based and clinical approaches

to healthcare and draws on several core competencies, including biostatistics and epidemiology, management and administration, clinical preventive medicine, and occupational and environmental health. Board-certified physicians in preventive medicine can hold many positions within a variety of healthcare settings, yet a common undercurrent of their work in all venues involves an approach to health that seeks systemic and population-based interventions to improve the health of individuals.

Preventive medicine residencies are offered at more than 75 institutions in the nation and include a general medicine internship, a year of classwork to attain a master of public health (MPH) degree, and a year of practicum work, which is often tailored to an individual's career interests and aspirations. The three specialty areas within preventive medicine residencies are (1) public health/general preventive medicine, (2) occupational medicine, and (3) aerospace medicine.

Another venue for potential preventive care that has received much attention is the school—more specifically, the role of school nurses in obesity prevention. Schools present a critical setting for addressing the significant and increasing public health problem of childhood obesity. School nurses are uniquely positioned to address obesity and offer preventive services such as height, weight, and body mass index (BMI) measurements along with healthy diet and lifestyle counseling.

Reimbursement

The USPSTF's rigorous evaluation of the literature offers authority to clinicians' utilization of many preventive services. The consensus among clinicians, researchers, and public health officials regarding the value of routine preventive services, as recommended by the USPSTF and described above, has prompted their reimbursement by both public and private health insurance plans.

The nation's Medicare program, for example, offers its beneficiaries many preventive services, including screening tests for heart disease; mammograms, pap smears, and pelvic examinations; bone mass measurements; colon cancer screening; prostate screening; diabetes testing; diabetes self-management training; foot care and supplies; flu shots; pneumonia vaccine; hepatitis B vaccine; and glaucoma screening. Despite these services,

however, Medicare falls short of providing comprehensive preventive care for its beneficiaries. One deficiency is that Medicare only covers one routine preventive physical examination that must be received within 6 months of initial enrollment in the program.

All the nation's state Medicaid programs provide inclusive preventive care for eligible recipients, who are mostly children and pregnant women, groups that benefit significantly from preventive services. The Early and Periodic Screening, Diagnostic, and Treatment (EPSDT) service is Medicaid's comprehensive and preventive child health program for individuals under 21 years of age. Defined by law in 1989, the EPSDT includes periodic screening, vision, dental, and hearing services. EPSDT guarantees that physicians will provide initial and periodic evaluations of children and assures that health problems are diagnosed and treated early, preventing complications, and improving health outcomes.

Although private health insurance coverage varies with respect to the preventive services covered, most private insurance policies provide comprehensive preventive care, especially for children and pregnant women.

Cost-Effectiveness

Intuitively, it is easy to accept the notion that prevention is more cost-effective than treatment. However, with respect to medicine and public health, this notion needs to be verified with evidence. While an emerging body of literature supports specific preventive-care interventions, no studies of the overall cost-effectiveness of preventive services have been conducted.

Recent literature tends to show that the cost-effectiveness of specific preventive services depends greatly on the particular intervention and its target population. For instance, a recent systematic review of the cost-effectiveness of preventive interventions for Type 2 diabetes mellitus suggests that primary prevention of that disease is highly cost-effective. Other interventions, such as strict blood pressure control, have also been shown to be overwhelmingly cost-effective. However, other individual interventions aimed at lowering weight, average blood glucose, and cholesterol levels varied significantly in their cost-effectiveness.

Although much more research is needed, it appears that the potential impact of preventive care both economically and with respect to improved health outcomes may be highly significant. For example, it has been estimated that about 800,000 deaths in the nation (40% of the total annual mortality) in 2000 were from preventable causes, such as tobacco use, poor diet, physical inactivity, and alcohol misuse. It also has been shown that preventive measures, such as tobacco cessation programs and screening for colorectal cancer, can reduce mortality at low cost or even at cost savings. It seems logical that if preventive services were more widely used they would lower mortality and likely lower the total cost of healthcare.

Barriers

Individuals face a number of barriers to receiving preventive care. One important barrier is lack of health insurance coverage. It is clear that individuals without health insurance often delay needed healthcare and many times entirely forgo preventive care. However, even individuals with health insurance coverage face significant barriers to receiving preventive care. Many characteristics of the physician-patient interaction have been found to hinder the delivery of preventive care, including the following: the physician's attitudes toward prevention, unfamiliarity with the USPSTF's recommendations, belief that some healthcare services do not fall under the physician's scope of care; hurried office visits and lack of time to address prevention; lack of financial incentives to provide preventive care; and patients' attitude toward preventive care. Another important dynamic of the physician-patient relationship that affects preventive services is continuity of care. Several studies confirm that identifying a regular site of care is associated with increased access to preventive services, particularly for women and children. The medical literature supports the value of both site and provider continuity in preventive care. Despite the growing rhetoric among policymakers and politicians about the importance of preventive care, the day-to-day infrastructure of healthcare delivery does not support this ideal. And a concerted effort must be made to overcome the many barriers to preventive care.

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See also Child Care; Diabetes; Disease; Health; Obesity; Primary Care; Public Health; Tobacco Use

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sound and socially acceptable" way; it is "universally accessible" to all in the community who seek it; it is affordable; and it is geared toward "self-reliance and self-determination." Primary care includes basic, routine, and preventive care that is often provided in an office or clinic by a provider who coordinates all aspects of a patient's health-care needs. It is often the patient's first contact with the healthcare system for a given health problem. Physicians, nurses, or other healthcare professionals can provide primary care. Primary-care physicians are generally considered to include those trained in family medicine or general practice, general pediatrics, and general internal medicine. Sometimes physicians in obstetrics and gynecology are also considered primary-care physicians. After briefly discussing problems with the U.S. health services system, this entry summarizes primary care's role in health services and how health policies can foster the provision of quality primary care to patients.

Background

Every complex organization, whether biological or social, requires a framework to support and coordinate its different functions. Healthcare systems rank among the various social systems that require a unified framework for appropriate functioning. Among industrialized nations, the United States is an anomaly because it lacks such a unified framework. A highly developed nation with well-developed and long-standing systems in many areas, such as education, it lacks any semblance of a health services delivery system with a structural framework. Historically, health services developed without any planning or regulation of their supporting structures and rules of conduct.

As a result, the United States stands alone among industrialized nations in its inability to respond to new imperatives and new challenges to public health. At the mercy of unaccountable market forces, the healthcare system reacts unpredictably, or sometimes not at all, to changing needs of the population for services of various kinds. Market-oriented organizations, including private universities and hospitals, medical-device manufacturers, pharmaceutical companies, professional organizations, and disease-oriented consumer advocacy groups, can set agendas for the operation

PRIMARY CARE

Primary health care, as defined by the World Health Organization (WHO), is "essential health-care" that is delivered in a "practical, scientifically

of health services according to the likelihood of these services furthering the interests of the group in particular ways of defining health needs. They can create unwarranted health demands, particularly among population groups whose care contributes to high rates of profit for the industry. Some in the health services research field believe that the federal and state governments have abdicated responsibility or accountability. This current system has resulted in continuing escalation of costs, proliferation of unnecessary and potentially harmful technology, and declining population health as measured by the United States' relative position in the world.

Importance of Primary Care

Numerous research studies in the United States have found that a greater primary-care physician supply is associated with a variety of positive health outcomes, including fewer instances of all-cause mortality; cancer, heart disease, stroke, and infant mortality; low birth weight; increased life expectancy; and higher self-rated health. These results were consistent across study years and geographic areas. Pooled results for all-cause mortality indicate that an increase of one primary-care physician per 10,000 people is associated with an average mortality reduction of 5.3%, or 49 fewer deaths per 100,000 deaths per year. Mortality rate reductions for the Black population were higher than those for the White population, indicating improved equity and effectiveness. At a national level, a 5.3% reduction in all-cause mortality in the year 2000 would have translated into about 130,000 averted deaths. In comparison, a decline in the number of deaths of about 2,000 is considered sufficient to justify a national focus on screening the entire adult population for colorectal cancer. An increase of one primary-care physician per 10,000 people would require a 12.6% overall increase in the primary-care physician supply, or an absolute one-time increase of 28,726 primary-care physicians, based on the supply in the year 2000.

These results are consistent with international comparisons of nations differing in the strength of primary care. Nations with strong primary-care infrastructures have lower mortality rates, with the greatest reductions for causes particularly sensitive

to primary-care interventions, such as asthma, heart and cerebrovascular diseases, and pneumonia. These results remain consistent after controlling for other important influences on health, including differences in age structure of the population, income per capita, gross domestic product (GDP) per capita, and behavioral factors such as smoking and alcohol consumption.

The evidence of the benefits of primary care is not limited to studies of the supply of primary-care physicians. There are demonstrated benefits from improving access to and use of primary-care practitioners as people's regular source of care, as well as from better experiences with the four cardinal features of primary care, which are detailed below. The greater the reported use of primary-care physicians as the regular source of care, the better the 5-year survival rates of patients, even after controlling for a variety of sociodemographic characteristics and initial health status: the better the experiences with the receipt of primary-care services, the better the self-reported health.

Beneficial Impact on Health and Costs

Primary-care services are the supporting spine of healthcare systems by virtue of four cardinal features: (1) They are generally the first contact point of access and use, (2) they are person-focused care over time instead of being disease focused, (3) they are comprehensive in the sense of taking care of all health-related needs except those too uncommon to maintain competence, and (4) they coordinate and integrate care that is more appropriately provided elsewhere.

In combination, these four functions constitute primary care. Their achievement makes it possible for care to be patient focused, family oriented, and relevant to the needs of the community in which people live and work. Primary care, when organized to carry out these functions, makes it possible to achieve more appropriate, safer, and less costly care. It helps people navigate the healthcare system so that they avoid the unnecessary or duplicated interventions that increase the risk of adverse effects and that are becoming common in the experiences of people.

Evidence for the beneficial impact of each of the four cardinal features of primary care is strong. That is, the filtering of patients by primary care,

the first-contact feature, is effective in reducing unnecessary visits to specialists that both increase costs and increase the risk of overuse and adverse effects. Moreover, the person focus of primary-care practitioners leads to better overall improvement in health. The third feature of primary care, comprehensiveness, is an important contributor to the beneficial impact of primary care. The breadth of problems that are dealt with in primary care as opposed to being provided by specialists is the most consistent distinction between nations that have strong primary care and nations with weak primary care. Both national studies and international comparisons show that the greater the number of physicians involved in caring for an individual patient, the worse the outcome. And last, the coordinating feature of primary care is responsible for reducing duplication of medical tests and adverse effects of interventions. These four features, which in combination may be referred to as “primary-care practice,” are associated with increased access to care for relatively deprived population groups, improved quality of care overall, better preventive services overall, better early interventions for health problems, fewer hospitalizations, and reductions in referrals to specialists, with resulting better population health at considerably lower costs.

A focus on achieving the combination of these four features explains why studies of people’s experiences with primary care are even more consistent in showing benefits than are studies that seek to correlate the supply of primary-care physicians to health outcomes. The mere presence of such clinicians does not assure that good primary care is being provided; some population subgroups may lack access to existing primary-care resources, and some purported primary-care practices may not be adequate in their provision of first-contact, person-focused, comprehensive, and coordinated care. Moreover, an excess of directly accessible specialists may detract from the benefits of existing primary-care resources by discouraging coordination and person-focused care, as well as by leading to unnecessary and excessive interventions in the context of the patient’s needs. Studies in the United States have shown that a greater supply of specialists available to the population does not improve the outcomes of care and, in fact, often worsens it. In 35 research studies dealing with differences between various geographic areas and rates of

mortality (total deaths, deaths from heart disease, cancer, and stroke, and infant deaths), 28 of the studies found that the greater the primary-care physician supply, the lower the mortality. And in 25 of the studies, it was found that the higher the specialist to population ratio was, the higher the mortality.

Primary Care’s Growing Importance

Four major challenges to health services delivery in the nation will make the role of primary care increasingly important in the future. First, the morbidity burden of the population will increase as a result of increased survival from individual diseases. Most people, particularly as they age, accumulate a higher burden of morbidity—that is, comorbidity. Coexisting illnesses cause the focus of medical attention and quality assessments on particular diseases to be inadequate. Clinical practice guidelines are based, at best, on randomized controlled trials (RCTs) that attempt to exclude individuals with coexisting disease, even though they may constitute the majority of people otherwise eligible to participate in the trial. Consequently, the results of the trial are not applicable to most people with the disease for which the guidelines are implemented. A major, largely unrecognized defect in the application of results of the trials is the assumption that their findings apply to all populations even though it is known that the properties of tests and interventions differ according to the characteristics of the target population: general communities, patients in primary-care settings, or patients in specialty settings. When applied in a general community, in the example of fecal blood screening for colon cancer, the proportion of false-positive tests is much greater than would be the case if the intervention were applied in primary-care settings or specialty-care settings; intervention applied to the whole population will lead to many more unnecessary interventions, with a much greater likelihood of adverse effects and greatly decreased cost-effectiveness. For most medical interventions directed at individuals in the population, it is much more effective and efficient to focus on their application to patients in primary-care settings than in community-based settings, with referral to specialists from primary care as needed.

Second, an increase in the morbidity burden of the population exists because of growing rates of

diagnosis of existing and new health problems. In the past two decades, the prevalence of diagnosed disease has increased markedly, largely due to lowered thresholds for diagnosis of individual diseases or inclusion of one or more risk factors as a proxy for a diagnosed disease. The increase has greatly expanded the market for use of medications, many of which have subsequently been shown to be dangerous. Primary care bears the burden, from increasing workloads to the challenges of dealing with adverse effects.

A third challenge is presented by an increase in the frequency of occurrence of adverse effects in medical interventions. These negative effects are estimated to precipitate more than 200,000 deaths annually in the nation. Between 4% and 18% of patient visits are also associated with adverse effects.

The rate of withdrawal of drugs from the market due to lack of safety has greatly increased since 1992, when the Food and Drug Administration (FDA) drug approval process was relaxed. Rates of nonindicated prescriptions have also increased. For example, the rate of prescribing medications for the common cold is 50% higher than the national desirable target, and the percentage of the elderly receiving a prescription for 1 of the 11 always-contraindicated drugs remains unchanged at about 3% per year. Deaths associated with medication errors increased markedly, by more than 65% in the nation just between 1990 and 1993. Only 40% of coronary angiographies are done competently; one fourth of those are erroneously read as showing severe disease; 6% of patients are informed that the test was normal although it was not; and one third of those individuals with misread tests have had surgery that was of uncertain benefit. The more physicians a patient sees, the greater the likelihood of adverse effects. Primary-care physicians, as the locus of responsibility for the ongoing care of patients, are in the best position to identify and deal with these adverse effects. Electronic health records, portable across a variety of settings, provide a way to facilitate identification of adverse effects and conduct research to establish more effective ways of dealing with these effects. However, to do this, a system of coding patients' problems, in the form of symptoms and signs, will have to become routine. Such a system exists but is not widely used in the

United States. To have it incorporated into medical practice will require considerable leadership from professional and policy-making bodies.

Finally, the imperative to reduce disparities in health resulting from avoidable differences in outcomes across different population subgroups remains a challenge to the healthcare system. In contrast to specialty services, which are distributed inequitably in most nations, primary-care services are generally equitably distributed. The exception is in the United States, however. The equity-facilitating influence of primary care is well documented, both from studies in the nation and elsewhere. The benefits of a greater supply of primary-care physicians are even greater for the Black population in this nation than for the majority White population and are greater in socially deprived areas than in more advantaged areas. Populations receiving their care from Federally Qualified Health Centers (FQHCs), which are required to maintain standards for primary-care practice, have fewer disparities in health outcomes between Black and White populations; studies in other industrialized nations such as the United Kingdom and in developing nations have had similar results. Thus, the move toward primary care can be considered a move toward equity in health.

Public Policy Directions

The supply of primary-care physicians in the nation is declining at a rapid rate, as is evident from the 45% reduction from 1997 to 2003 in the number of medical school students intending to enter a primary-care specialty. Chronic underfunding of primary-care services as compared with specialists has contributed to this decline in the attractiveness of primary-care practice, as the level of reimbursement for fee-for-services payment is set by reference to historical levels of relative reimbursement rather than to the difficulty and time requirements of practice. As a result of media focus on the technologic and pharmacologic aspects of health services, the public has come to believe that specialty care is superior to primary care; hence, population groups with rich insurance coverage and the ability to pay out of pocket have set the standard of seeking out specialty care directly. Research on the quality of care, however, is consistent in showing that primary care is superior to specialty care when the outcomes

are broad rather than focused on diseases. Recent literature reviews indicate that even outcomes for specific common diseases are at least as good if not better when care is provided by primary-care physicians, appropriately buttressed by care from specialists. Early studies purporting to demonstrate the superiority of care from specialists were fraught with methodological inadequacies, especially with regard to controlling for overall morbidity burden. Even the extensive focus on evidence-based quality of care fails to give sufficient attention to the special benefits of primary care in relation to person- and population-focused outcomes rather than disease outcomes. This failure is due to the inappropriateness of guidelines for “all-or-nothing” performance measures.

The health services research community has not been in the forefront of primary care, most of which is carried out by primary-care physicians. In view of the evidence that some health system structures and processes have a major impact on outcomes, this seems to be a notable oversight concerning an important aspect of investigations into the role and impact of health services.

Preliminary evidence indicates that at least three features of health systems and two features of practice have a notable influence on health indicators at national levels. The systemic features include (1) national efforts to distribute health service resources according to need, (2) nonuse of copayments for primary-care services, and (3) tax-based health or regulated financing systems ensuring universal benefits. The practice characteristics most consistently associated with strong primary care are (1) comprehensiveness of services within primary care and (2) family orientation of health services. None of these characteristics are covered by U.S. health policy—and practically none by health services research in the nation.

Future Implications

The way that specialists and primary-care physicians provide healthcare differs. Their roles are different and need to be separately identifiable. There are almost certainly large differences in costs and activities, and high national health services costs and poor health outcomes result at least in part from an underuse of primary care and an overuse and misuse of specialty care. Both primary

care and specialty care have important roles to play in the care of the population, and researchers can help policymakers make rational, evidence-based decisions about the relative functions and appropriate contributions of each.

Barbara Starfield

See also Equity, Efficiency, and Effectiveness in Healthcare; Physician Workforce Issues; Physicians; Preventive Care; Primary Care Case Management (PCCM); Primary Care Physicians; Public Health; Public Policy.

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<http://www.aap.org>

American College of Physicians (ACP)

<http://www.acponline.org>

American Osteopathic Association (AOA)

<http://www.osteopathic.org>

PRIMARY CARE CASE MANAGEMENT (PCCM)

The Centers for Medicare and Medicaid Services (CMS) defines Primary Care Case Management (PCCM) as case management-related services, including the locating, coordinating, and monitoring of healthcare services provided by a physician, a physician group practice, or an entity employing or having other arrangements with physicians under a PCCM contract with a state. These contracts can also be with nurse practitioners, certified nurse midwives, and physician assistants. State Medicaid agencies administer PCCM programs in which primary-care providers are responsible for managing the care of Medicaid recipients, including routine primary and preventive services, coordination of care, and arrangements for specialty services, usually without network restrictions. The primary-care providers receive reimbursement on a fee-for-service basis for the services they provide as well as a flat per-member-per-month fee or an increase in their preventive service fees to compensate for care management.

History

PCCM as an approach to Medicaid was enabled by an amendment to Title XIX of the Social Security Act in the Omnibus Budget Reconciliation Act of 1981. The addition of Section 1915(b) authorized the waiver of statutory requirements that Medicaid programs offer comparable benefits statewide and offer recipients freedom of choice in obtaining services. The amendment also specified that PCCM services would be Medicaid-covered and that qualifying PCCM programs must make provisions for 24-hour emergency treatment and reasonable geographic availability delivery sites as well as have a sufficient number of physicians to

serve the Medicaid population promptly and without compromise to the quality of care.

The Balanced Budget Act of 1997 further amended the Social Security Act to include a new Section 1932 state plan option as an alternative to seeking waivers under Section 1915(b) and research and demonstration projects under Section 1115. The new authority permitted states to implement mandatory managed care without waivers and without the cost-neutrality requirements associated with Section 1115. Approval could be obtained through a state plan amendment, and there was no time limit on the approval. The managed-care state plan was also required to offer enrollees in urban areas a choice between at least two managed-care organizations or between a PCCM system and a managed-care organization. In rural areas, there could be one managed-care organization or PCCM as long as there was a choice of physicians or case managers.

Growth of PCCM Programs

By the mid-1980s, states interested in increasing access to healthcare while holding providers accountable and controlling costs began enrolling Medicare recipients in PCCM programs. These programs attempted to reduce inappropriate hospital emergency department use and other types of high-cost care. In many instances, states developed PCCM programs as a stepping stone to risk-based managed care, and these programs grew steadily during the 1990s. When commercial managed-care organizations began declining to serve Medicaid populations in many markets, even those states that originally intended to move all their Medicaid recipients to risk-based managed care began considering PCCM as a viable method for maintaining Medicaid managed-care delivery systems.

Presently, 30 states in the nation use PCCM, and it is the model of choice for rural areas, where a relative scarcity of providers and a scattered population have resulted in weaker managed-care penetration. Due to its flexibility, PCCM is also used in urban areas. It is frequently the default enrollment for Medicaid recipients who fail to make a choice of a plan. Furthermore, PCCM may be used only in specific markets and also statewide, under either voluntary or mandatory conditions. In markets where feasible, states commonly offer both PCCM

programs and risk models. The resulting competition increases recipient choice and motivates both managed-care organizations and PCCM programs to improve quality and service. However, states must be careful to apply access, quality, and reporting standards evenly to avoid encouraging managed-care-organizations' withdrawal.

In addition to the benefits associated with PCCM's flexibility from the perspective of states, it has enjoyed popularity with both patients and primary-care providers. Medicaid recipients entering PCCM programs report finding stable relationships with their physician and appreciating the lack of restrictions usually associated with managed care. And primary-care providers are pleased not to have to assume the financial risk for the care of their patients and find that they have greater control over medical decision making as well as less administrative burden. They also recognize that states are willing to take their concerns seriously and to find better ways to support them.

Comparison of PCCM Programs and Managed-Care Organizations

PCCM programs, which are legally recognized as managed-care plans, are similar to managed-care organizations in several ways. Notably, the structure of PCCM programs includes a panel of physicians, and one primary-care provider is charged with the primary responsibility for each recipient. PCCM also structures incentives for both physicians and recipients to encourage appropriate use of healthcare services. Additionally, PCCM programs typically conduct utilization reviews, patient education programs, and quality-monitoring activities.

An important difference is that states themselves are in charge of PCCM programs rather than a managed-care organization contractor, which means that state Medicaid agencies either directly administer PCCM or manage a contractor to handle administrative functions. Although such responsibilities are demanding for Medicaid agencies, this aspect of PCCM programs offers states an important opportunity to tailor programs to their policy goals in terms of populations, culture, and public health priorities. Furthermore, PCCM provides an assurance of continuity; unlike a for-profit managed-care organization, a state agency cannot consider leaving when a market turns unprofitable.

Another major difference between PCCM programs and managed-care organizations is the sharing of financial risk. PCCM physicians, with fee-for-service reimbursement supplemented by a management fee, do not take on additional risk. Therefore, PCCM programs are attractive to physicians because they are not disadvantaged when they have a sicker-than-average group of patients.

Trends in PCCM Practices

State PCCM programs differ because each state has taken a different approach that depended on its particular managed-care environment, and policy goals of states also vary. Nevertheless, several trends in the structure and operation of PCCM are apparent and reflect the significant evolution of PCCM over time.

Expanded Eligibility

In addition to enrolling a core population of individuals receiving Temporary Assistance for Needy Families (TANF), PCCM is also frequently being used to extend health insurance coverage to hard-to-serve populations, such as Supplemental Security Income (SSI) disabled children and adults, the aged, and children in foster care. Since the advent of the State Children's Health Insurance Program (SCHIP), most states have incorporated SCHIP members into their PCCM programs as well. Many states have also targeted individuals with chronic medical conditions and have integrated disease management into their PCCM programs.

Provider Recruitment and Retention

States are focusing on improving provider recruitment and retention by supporting participating providers through specially designated outreach staff, operating provider hotlines, implementing feedback mechanisms such as provider profiling, and devising strategies to gain providers' input and suggestions. Rather than second-guessing the decisions of physicians, states frequently provide tools to allow providers to police themselves and, when necessary, dedicate resources for working with outliers to improve their practices. States also have found that providing educational outreach, as by disseminating best practices and making available

online instructional models, to be an effective support for providers. Taken together, these activities may produce strong state-provider relations and ultimately result in increased commitment from a wide variety of providers.

Quality Activities

Increasingly, states are applying many of the principles commonly used in network management to ensure that Medicaid recipients receive quality care from PCCM programs. For example, states are putting tighter language into their provider contracts and dedicating staff to monitor compliance with the stricter standards. In some cases, PCCM programs also are including strict provider credentialing, member surveys, care coordinated across multiple providers and conditions, 24-hour member services and nurse advice lines, community-based preventive health campaigns, Healthcare Effectiveness Data and Information Set (HEDIS) reporting to gauge the primary-care provider's performance, member education and health needs assessment, disciplined utilization management, disease management programs, complaint log reviews, and provider profiles.

Enrollment Process

Informing prospective members about Medicaid managed care and its requirements in a manner that ensures a full understanding of the PCCM program and how to access services remains a critical challenge. To overcome the intrinsic issues associated with enrollment, private enrollment vendors or brokers are increasingly being used to conduct enrollment and other functions. A variety of enrollment strategies is used, including providing informational materials and instructions about how to enroll, holding group educational sessions, operating toll-free help lines, and offering individual face-to-face counseling.

The mobility of Medicaid recipients also presents a significant challenge, creating discontinuity between the time individuals are enrolled in Medicaid and the time they enroll in PCCM. To address this issue, states are conducting telephone outreach at the time of the initial Medicaid eligibility determination. Additionally, some state agencies responsible for Medicaid eligibility determination

are educating recipients about PCCM and encouraging timely enrollment.

Increasing PCCM Active-Care Coordination

Some states are including an active care coordination component in their PCCM programs, recognizing that the referral process is the key to managing services, and they are making significant efforts to streamline prior authorization for providers. Additionally, care coordinators who are familiar with available resources and the community are often employed to more effectively respond to questions and concerns from both members and providers. These care coordinators may also be expected to collaborate with existing services, such as the Women, Infants, and Children (WIC) program, as well as empower local communities to change their service delivery system. Care coordinators may also be deployed to work with community service agencies and other providers to coordinate resources and services on the behalf of members with special needs.

Provider Reimbursement

States with incentive payment systems have found that these systems can be very effective in reinforcing primary program goals, and some state Medicaid agencies have gone beyond the basic fee approach. To encourage the provision of certain primary-care services, some states are reimbursing primary-care providers at enhanced rates rather than reimbursing them at the standard per-member-per-month fee. Other states have adopted partial capitation for primary care, paying a capitated amount for basic office visits and an enhanced payment for targeted services. Still other states allow primary-care providers to receive a per-member-per-month payment and also participate in a bonus pool that is distributed annually based on a composite measure of the physician's Medicaid caseload, hospital emergency department use, and defined prevention and quality goals.

Future Implications

The primary goals of PCCM programs are to reduce costs while improving patient outcomes.

Few evaluations of these programs have been conducted, and those that have been conducted are dated. They tended to focus on cost saving and service utilization, but they did not address patient outcomes except to suggest that PCCM programs improved access, especially to primary care.

In general, existing evaluations of PCCM programs have recorded initial savings in the range of 5% to 15% as compared with a similar fee-for-service population. This level of savings is considered comparable to the savings achieved by managed-care organizations. Savings from PCCM programs have been reported to result from changes in utilization patterns. Costs typically increase for primary-care services and prescription drugs, but the increases are offset by decreases in the costs of hospital emergency department use and inpatient services. In addition to the positive evaluations, a few of the early evaluations were negative, and as a result some state PCCM programs were abandoned in favor of full-risk or managed-care-organization-only models. Given the millions of Medicaid recipients enrolled in state PCCM programs, much more research needs to be conducted to evaluate the long-term benefits and problems of these programs.

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See also Access to Healthcare; Case Management; Cost of Healthcare; Managed Care; Medicaid; Primary Care; Quality of Healthcare; State Children's Health Insurance Program (SCHIP)

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PRIMARY-CARE PHYSICIANS

Primary-care physicians generally serve as the first point of contact to the healthcare system for nearly all of a patient's medical and healthcare needs, including the treatment and diagnosis of health conditions and the provision of preventive and continuing care. Under the managed-care model, the primary-care physician also acts as a gatekeeper who controls access to specialists or costly procedures as a mechanism to control healthcare costs. Primary-care physicians may follow patients in a variety of healthcare settings, including outpatient clinics, offices, hospitals, long-term care facilities, and the patient's home.

Physicians trained in family medicine, general internal medicine, and general pediatrics typically are considered to be primary-care physicians. Additionally, health insurance plans may differ in regard to whether pediatricians and obstetricians/gynecologists, who specialize in the care of women, are considered primary-care physicians. Family physicians generally provide comprehensive care to patients from infancy till the end of life. Pediatricians

are considered primary-care physicians for children, adolescents, teenagers, and young adults, while internists, who are practitioners of general internal medicine, provide care to adults.

Because of the aging of the nation's population, greater focus on prevention efforts and lifestyle changes, and the prevalence of acute and chronic diseases, the need for primary-care physicians has grown substantially. In recent years however, the number of primary-care physicians in the United States and other developed nations has been declining, as most physicians tend to specialize in an area of practice. A survey conducted by the University of Missouri-Columbia and the U.S. Department of Health and Human Services (HHS) predicts that by the year 2025, there will be a national shortage of 35,000 to 44,000 primary-care physicians. As a result, the current and future shortage of primary-care physicians is of concern among policymakers and healthcare planners.

Overview

Early practitioners of the science and art of medicine were primarily generalists. The breadth of their practice included diagnosing and treating a variety of illnesses, using apothecaries, and performing surgery. The concept of primary care, however, began to be formalized in the 1960s when the term appeared in the medical literature attempting to define its content and the scope and the role of the primary-care physician. Prior to this time in the United States, a movement toward specialization beginning in the early 1900s resulted in the first medical/physician specialty board being formed in 1916. The American Board of Medical Specialties (ABMS) was established in 1933 to ensure that physicians had a certifiable body of knowledge. ABMS's mission was to establish and maintain high standards for the delivery of safe, quality medical care by certified physician specialists. The American Board of Pediatrics (ABP) and the American Board of Internal Medicine (ABIM) were later established in 1935 and 1936, respectively. Today, ABMS member boards certify physicians in more than 130 different specialties and subspecialties.

After World War II, the rise of specialized care and provider specialization continued. This growth was supported by economic and professional

incentives. And the decline in the number of general practitioners that had already begun before the war accelerated. The percentage of primary-care physicians in the nation declined from more than 80% in the early 1900s to less than 20% by 1960.

In response to the growing public concern over the reduced number of general practitioners, the American Academy of General Practitioners (now the American Academy of Family Physicians) was founded in 1947 to assist these practitioners in preserving and advancing the specialty. The American Academy of Family Physicians later joined with the American College of Physicians, representing internal medicine, and the American Academy of Pediatrics to become one of the largest organizations representing the primary-care specialty of family medicine. Eventually, in 1969, family medicine was established as the 20th primary medical specialty recognized by the American Board of Medical Specialties, and as a result of these efforts, general medicine was reborn.

Primary-Care Practice

The scope of primary-care physicians' practice generally includes the basic diagnosis of common health conditions and nonsurgical treatment and interventions. During the clinical encounter, primary-care physicians gather information about the patient's condition, symptoms, and medical history through interviewing. Primary-care physicians are also trained to order and interpret medical tests such as routine labs, electrocardiograms, and X rays. For more complicated diagnoses, however, they may refer the patient to a specialist with further specialized training or experience. After obtaining medical test results, primary-care physicians will make a diagnosis and may send the patient for further testing, referral to specialized care, therapy, diet or lifestyle changes, treatment, and/or follow-up. Primary-care physicians may also perform routine screenings and immunizations as well as counsel patients on health behaviors and self-care.

With more than 130 physician specialties and subspecialties, there inevitably exist overlapping boundaries in care. Yet the decision-making of primary-care physicians does differ from other specialized physicians who include some primary-care services in their practices.

The structure of the primary-care practice may include a team of physicians and nonphysician health professionals charged with establishing and sustaining a long-term, personal relationship and partnership with individuals and their families. Primary-care physicians and members of the healthcare team serve as advocates for the patient in coordinating the use of the entire healthcare system to benefit the patient. Additionally, primary-care physicians assist with helping patients navigate the system. For example, they may coordinate a full array of services that are essential for maintaining and improving the individuals' health status while providing nonepisodic interventions early in the disease process.

Future Implications

The ultimate goal of a healthcare system is to provide the highest quality of care, at the lowest possible cost, to the greatest number of people. Possible strategies to help accomplish this include increased financing to support primary-care practices, revitalizing primary-care education, and promoting the value of care that is accessible, comprehensive, coordinated, continuous, and accountable, provided by primary-care physicians and other nonphysician primary-care clinicians.

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See also Acute and Chronic Diseases; American Academy of Family Physicians (AAFP); American Academy of Pediatrics (AAP); General Practice; Physicians; Preventive Care; Primary Care; Primary Care Case Management (PCCM)

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PROJECT HOPE

Project HOPE (Health Opportunities for People Everywhere) is a nonprofit, international organization that is dedicated to improving the quality of life of the most vulnerable members of society, with a particular emphasis on women and children. Project HOPE's mission is to attain sustainable advances in healthcare globally by implementing health education programs and humanitarian assistance. Project HOPE is well-known in the field of health services research for its health policy journal *Health Affairs*.

Background

Celebrating its 50th anniversary in 2008, Project HOPE was founded as a floating hospital by William B. Walsh. After witnessing poor health conditions, particularly of young children, in the South Pacific while serving as a medical officer during World War II, Walsh persuaded President Eisenhower in 1958 to donate a naval ship to provide charity healthcare. The ship was later transformed into the S.S. HOPE and Project HOPE was formed. In September, 1960, the S.S. HOPE set sail from San Francisco to Indonesia. Although

the *S.S. HOPE* was eventually retired in 1974, it made a total of 11 voyages to various countries around the world. Today, Project HOPE continues to operate land-based programs, including medical training and health education in more than 30 countries across 5 continents.

Project HOPE is dedicated to providing sustainable solutions to health problems by helping people assist themselves. The organization improves the local capacity to sustain improvements in health and improve access to healthcare. It has programs across the globe, in locations including Africa, the Americas and the Caribbean, Asia and the Middle East, Central and Eastern Europe, and Russia/Eurasia. Project HOPE's current programs in Africa are fighting to combat HIV/AIDS, malaria, and other diseases; poverty and hunger; infant mortality; and maternal mortality. Its programs in South American countries target access to healthcare services for women and children. And in Asia its programs are focused on addressing infectious diseases and women's health issues.

Project HOPE also provides humanitarian and emergency assistance in areas that are affected by disasters. Additionally, the organization strives to provide long-term access to essential medicines and medical supplies to underserved areas. Since 1987, Project HOPE has shipped nearly \$1 billion in humanitarian assistance globally.

The organization also maintains expertise in various health and medical disciplines and provides health professionals education through various programs, ranging from the training of rural health promoters in primary care to the establishment of specialized tertiary-care medical programs. Project HOPE's implementation of train-the-trainer methodologies has resulted in millions of healthcare professionals being better equipped worldwide. Project HOPE has also laid the foundation for a healthier future by building, and training the staff needed to operate, hospitals and clinics, especially those targeting the special needs of children. The facilities serve as national training centers for healthcare providers in addition to being an invaluable resource to improve the health of children in developing countries.

Project HOPE is a registered organization of the U.S. Agency for International Development (USAID) and is a member of the Partnership for Quality Medical Donations. The organization

maintains close collaborations with local partners to ensure that efforts are not duplicated in meeting the needs of those it serves.

Health Affairs

Project HOPE has published the leading peer-reviewed health policy journal, *Health Affairs*, since 1981. The journal consistently ranks at the top of its categories in the *Journal Citation Report*. Its founding editor, John K. Iglehart, is a member of the National Academy of Sciences, Institute of Medicine (IOM) and national correspondent for the *New England Journal of Medicine*. The idea for *Health Affairs* was spawned in the 1970s when Walsh, Project HOPE's founder, concluded that it should expand its reach by publishing a journal to focus on the U.S. healthcare system.

Health Affairs is a multidisciplinary journal that covers topics such as access, costs, and quality of healthcare; Medicare; Medicaid; healthcare reform; and prescription drug coverage. The journal is nonpartisan and publishes a wide range of timely health articles, which focus on research and commentary that are of concern both domestically and abroad.

Health Affairs is published six times a year with additional supplements and is also available online. The authors that contribute to the journal include acclaimed scholars, policymakers, and leaders in the healthcare industry. The journal averages about 33,000 readers per printed issue, and the readership includes legislators, healthcare leaders and professionals, academics and researchers, health policy analysts, and advocates. *Health Affairs* is widely cited in the national media and press, including *The Washington Post*, *The New York Times*, *The Wall Street Journal*, and CNN, and it has been referred to as the "bible of health policy." Between January and July, 2006, alone, the journal was cited 18 times in U.S. congressional testimony, which is illustrative of its policy influence.

The journal is divided into the sections of Feature Articles, Commentary, Interviews, Narrative Matters, Health Tracking, Data Watch, Grant Watch, UpDate, Book Reviews, and Letters to the Editor. *Health Affairs* also publishes thematic issues each year that explore a topic in depth as well as on "variety issues."

Future Implications

Project HOPE continues its work to improve the lives of people throughout the world, particularly among low- and middle-income countries, by educating healthcare professionals and volunteers, training community workers, providing essential supplies and medicines, and combating infectious diseases. Additionally, *Health Affairs* remains an influential force in informing the public policy debate on issues that are of particular concern in healthcare.

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See also Access to Healthcare; Healthcare Reform; Health Services Research Journals; International Health Systems; Medicaid; Medicare; Quality of Healthcare; Vulnerable Populations

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 Abroad: <http://americanhistory.si.edu/hope>

PROSPECTIVE PAYMENT

The manner in which healthcare organizations are paid for the services they provide can influence their organizational behavior. Healthcare

organizations are generally paid in three ways: (1) on a cost-based basis, (2) on a capitation basis, or (3) on a case-based basis. On a cost-based basis, such as fee-for-service, the organization is paid for all the services it provides, which is a powerful incentive for high levels of effort and service. Payment on a capitation basis consists of a flat payment to the organization per person cared for, with the organization assuming the risk that the payment will cover the cost of the patient's care. On a case-based basis, the organization is paid a single payment for an episode of care, and the payment does not change if fewer or more services are provided. The various payment types may be either retrospective or prospective.

Medicare's Prospective Payment System

The best-known example of case-based payment in healthcare is Medicare's prospective payment system (PPS), which was mandated by the U.S. Congress to control community hospital inpatient costs in 1983. Under this system, the Medicare program changed its mode of payment for hospital inpatient care from a retrospective cost-based system to a prospective case-based system.

After the Medicare program was established in 1965 the costs of hospital care soared. One of the major factors that led to rising costs was the retrospective cost-based payment system. Under this system, hospitals submitted their bills to Medicare after the care had been given and the costs to the hospital were known. Hospitals were then paid for the care they provided, as allowed by Medicare rules, regardless of whether the costs were high or low, excessive or appropriate. Consequently, there was little incentive for hospitals to be cost-effective.

On the other hand, the prospective case-based payment system set payment rules prior to when the care was given. By setting a fixed reimbursement level per case based on diagnosis, the PPS provided economic incentives to conserve the use of resources. Hospitals that used more resources than covered by the flat rate lost the difference. Those with costs below the rate retained the difference.

Diagnosis Related Groups

Under Medicare's PPS, the amount paid to hospitals is based on their patients' Diagnosis

Related Groups (DRGs). Specifically, each patient is assigned into one of more than 500 DRGs, based on principal diagnosis, age, and medical complications. The DRGs aggregate patients with similar resource-consumption and hospital length-of-stay patterns. Medicare then pays the hospitals a set amount for each DRG. The government calculates the payment for each DRG based on national averages. It also modifies that amount somewhat based on local wage rates, geographic location (e.g., rural versus urban area), and whether the hospital is a teaching hospital.

Effects of Medicare's Prospective Payment System

Extensive research has been conducted to examine the impact of Medicare's PPS on hospitals and patients. This research has focused on the system's impact on average hospital length of stay, access to and quality of care, financial condition of hospitals, overall effects on costs, and hospital management.

Average Hospital Length of Stay

Since Medicare's PPS pays hospitals a fixed amount based on the patient's DRG, there is an incentive for hospitals to discharge their patients as soon as possible. Given that revenue is fixed, the time a patient spends in the hospital will determine the profit or loss. As a result, one of the ways to increase profits is to reduce the number of days of care taken to treat a patient. Many studies have reported that hospital average length of stay did drop after the introduction of the system.

Access to and Quality of Care

With the introduction of Medicare's PPS, many policymakers and the general public were concerned that it would induce hospitals to save on costs by cutting corners—reducing access to care and the quality of care—by refusing to treat costly patients or by closing treatment units. Researchers have addressed these issues to some extent; however, the results have been mixed so far.

Financial Conditions of Hospitals

Because Medicare's PPS puts a degree of financial stress on hospitals, particularly on those that have higher than usual costs, there was a concern about their financial viability. When PPS was first established, its fixed payment rates proved sufficiently generous, and average hospital operating margins increased. However, over time, the rates were lowered. By the late 1980s and through the early 1990s, average operating margins for the Medicare segment of hospital patients tended to be negative.

Overall Effects on Costs

The main objective of the Medicare PPS was to control hospital costs. With regard to the effect of PPS on reducing hospital expenditures, one study found that for a sample of California hospitals, those under the strongest pressure from PPS responded by reducing expenditures. Another study found that PPS reduced Medicare's hospital costs substantially. In terms of Medicare's overall budget, the PPS appears to have been effective in slowing down expenditures. The PPS reduced the historic rates of growth in total Medicare spending. However, the reduced growth in inpatient spending was partially offset by increases in spending on hospital outpatient care, skilled nursing care, home health care, and physician payment increases.

Hospital Management

The Medicare PPS was designed to create incentives for the balancing of costs and benefits in treating patients. It led hospitals to begin to explore mechanisms for more accurate product costing. Under cost-based payment, when health-care providers were directly reimbursed for whatever costs they incurred, accurate cost measurement was of little concern. However, under PPS, the revenue per patient is not merely a reflection of reported cost but is instead a fixed amount. If the true underlying cost is substantially more than the revenue for a certain type of patient, the hospital must be aware of it. Similarly, hospitals must also be aware if the cost is much less than the revenue. Medicare's PPS encouraged the use of product-line costing, which led to more efficient hospital financial management.

Future Implications

After applying PPS to community hospitals, the federal government developed and applied similar systems in other healthcare settings. Medicare now uses PPSs for hospital outpatient services, inpatient psychiatric hospital care, inpatient rehabilitation hospital care, inpatient long-term hospital care, skilled-nursing facility care, home health care, and hospice care. It seems likely that these systems will remain in use for many years to come.

Tae Hyun Kim

See also Centers for Medicare and Medicaid Services (CMS); Cost Containment Strategies; Cost of Healthcare; Diagnosis Related Groups (DRGs); Healthcare Financial Management; Hospitals; Medicare; Medicare Payment Advisory Commission (MedPAC)

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PROVIDER-BASED RESEARCH NETWORKS (PBRNs)

Provider-based research networks (PBRNs) are collaborative partnerships between academically based investigators and community-based physicians who share an ongoing commitment to developing and conducting health-related research. PBRNs provide the infrastructure and support necessary to conduct community-based clinical research studies on an ongoing basis, thus providing stability and continuity that transcends individual studies. PBRNs address many shortcomings of academic medical centers—only research and present several distinct advantages to it; most notably, these entities provide access to a much larger population of prospective clinical research trial participants.

Clinical research trials are the means by which medical researchers explore and answer specific questions about health. Clinical trials, translational research, epidemiological research, health services research, and several other categories are included in the broader definition of clinical research.

Academic medical centers (AMCs) have long been the centers of clinical research, the development of new knowledge, and the transfer of that knowledge to the next generation of researchers and care providers. There, teams of investigators develop research questions and methods for examining them and also carry out the research through voluntary enrollment of study subjects who are often patients at the centers. Having AMCs as the center of the clinical research universe has many advantages, including the presence of both clinical and research infrastructure and the synergy that can be developed among academics, researchers, and clinicians; but it also has several limitations.

In 1961, one of the founders of health services research in the United States, Kerr L. White, presented a statistical estimate with far-reaching implications for both medical education and population-based clinical research: For every 1,000 adults at risk of being ill or using health services in a given month, only one will be referred to an AMC. While the precision of this estimate has been debated and patterns of care may have shifted since 1961, the implications remain relevant today. If this estimate is accurate, although the overwhelming

majority of clinical research is conducted in AMCs, less than 1% of the relevant population is being seen at AMCs, and only a small subset of these individuals is enrolling in clinical research trials. A tremendous risk of selection bias exists then, jeopardizing the external validity of the majority of clinical research. Furthermore, limiting clinical research access to only AMCs induces a bottleneck in completing clinical research studies, consequently slowing the pace of medical progress.

In 2006, a contract research organization, Westat, completed and published the *Inventory and Evaluation of Clinical Research Networks: A Complete Project Report*, a comprehensive worldwide study of clinical research networks. This report identified 262 PBRNs with a variety of funding sources and organizational structures, and spanning multiple types of research and subject populations. The majority of these networks are less than 10 years old; however, others have been in existence for 50 years. Currently, 62% of these networks are funded by the federal government. Another 10% are funded by nonprofit organizations, 9% are funded by a government outside the United States, and 8% are funded by academia. Approximately 60% receive funding from more than one source; 52% report operations in the United States only, while 32% report operations in the United States and internationally, and 16% report exclusively international operations. Universities and AMCs continue to play a dominant role in many networks, while other network members span the healthcare spectrum and include the following: state and federal government healthcare facilities, community hospitals, individual or group physician practices, clinical laboratories, pharmaceutical companies, foundations, contract research organizations, and health maintenance organizations (HMOs).

The research areas vary widely, and include epidemiology, behavior modification, health communication, patient care, medical practice, clinical quality improvement, research-centered surveillance, and clinical process improvement, among others. Approximately 60% of the studies conducted through PBRNs are clinical trials, 24% are epidemiology and other observational studies, 6% are other interventional research, and 2% are outcome oriented. As far as the populations being studied are concerned, these research network

projects are variously organized by demographic characteristics (e.g., age group, gender, and race), disease type (e.g., AIDS, cancer, and heart disease), practice type (i.e., primary care and specialty services), and point on the care continuum (i.e., prevention, early detection, treatment, or disease survivorship).

Research Generalizability and Medical Progress

Among its many benefits, PBRNs broaden the access points between clinical research studies and the total potential participant population, helping ensure better research with more generalizable findings. PBRNs broaden clinical research's reach to include more members of the more than 99% of the population described by White as being "at risk" but not seen at AMCs, thus offering inclusion of people who would not seek care at the centers for any number of reasons, including their geographic relation to them, insurance coverage, perceived nonnecessity of AMC-based care, or other factors. By including members of this larger, more diverse population, the research is more likely to result in findings that are more broadly representative of it and therefore generalizable. More comprehensive population representation is of increasing importance with, for example, the current growth of genetics research. With striking limitations on the geographic reach of AMCs, PBRNs help give such genetics-based studies a broader reach, which may prevent the exclusion of potentially geographically clustered and genetically distinctive populations. These efforts help medical researchers improve the understanding of genetic pathways of disease and extend the applicability of research findings to these populations.

By opening the access points to a larger population, PBRNs also serve to expedite the pace of medical discovery. Simply put, patient enrollment is one of the most time-consuming components of most clinical trials. Individual studies can spend many years enrolling a sample of individuals sufficient to allow the statistical power to demonstrate an intervention's effectiveness. With PBRNs' access to a broader population, there is an increased probability of an individual with the right trial-specified clinical characteristics seeking care at a location that offers access to the trial. This greater rate of

patient-to-trial exposure can translate into more rapid overall trial enrollment and, consequently, more rapid trial completion. A prime example of this is cancer prevention research, which is often conducted among healthy populations.

Because cancer prevention trials often require a very large participant sample size to allow for statistically powerful analysis, this type of project may be impractical at an AMC. Beyond potentially limited trial access to the less than 1% of individuals at risk who seek care at AMCs, a large proportion of patients have considerable health concerns that would preclude their enrollment in the trial. PBRNs open the door to a dramatically larger, generally healthier population that sees their geographically more accessible practitioners for everything ranging from annual checkups and flu shots to symptom-induced visits for transient health issues to ongoing care needs that are not severe enough to either warrant referral to the AMC or preclude the patient from a prevention trial. Most recently, this benefit of PBRNs has perhaps been visible as a significant component of the National Institutes of Health's (NIH's) Roadmap, which is the federal plan for medical research in the 21st century.

Translating Research Into Practice

As part of NIH's Roadmap, the importance of developing new partnerships among patient communities, community-based physicians, and academic researchers is recognized. Indeed, several institutions and federal agencies are developing PBRNs or have them already in place. To this end, the NIH and other federal agencies are aware of the role PBRNs can play in both translating research results into better care and closing the gap between discovery and delivery.

For many medical-care innovations, providers often remain unconvinced that sufficient evidence exists to support the implementation of research-tested clinical services in real-world practice settings. The national Institute of Medicine's (IOM) 1998 report, *Bridging the Gap Between Practice and Research: Forging Partnerships With Community-Based Drug and Alcohol Treatment*, describes how the clinical-care community perceives an excess of "efficacy" research and a simultaneous dearth of "effectiveness" research. Many have noted that most research on clinical services takes place in AMCs, yet

most care is delivered in community settings. Consequently, for many community-based providers, evidence-based practice awaits more practice-based evidence. These observations suggest that the acceptance and implementation of evidence-based clinical services in community-based practice settings depends less on dissemination, which connotes a one-way flow of knowledge from researchers to providers, than on knowledge exchange, which involves two-way communication between researchers and providers. In PBRNs, this exchange is structurally facilitated, as community-based providers assume primary responsibility for seeing patients and for collecting research data and participating in other aspects of the research process. On the discovery-to-delivery continuum, the process of seeing patients represents the critical process of implementation, which remains a daunting challenge no matter how strong or credible the evidence.

For all but the simplest clinical services, successful implementation depends on administrative support, adequate financial and human resources, and organizational culture that values scientifically based practice. Indeed, systematic reviews indicate that multifaceted interventions that target organizational staffing, office workflow, and information systems are more effective in changing provider behavior than interventions that increase provider awareness and knowledge, such as continuing education and academic detailing. These findings suggest that the implementation of evidence-based clinical services necessitates systemic organizational changes, including the development of a supportive infrastructure and culture for both academic settings and, perhaps more important, community-based practice settings.

These systemic organizational changes are of growing importance because the recent healthcare market trends emphasize efficiency and may serve to erode the professional values and norms that emphasize scientifically based practice and the conduct of historically inefficient clinical research.

PBRNs involve both knowledge exchange and systemic organizational changes. As such, they are a promising model for both disseminating and implementing evidence-based clinical services and, ultimately, improving the quality of care. Knowledge exchange occurs through community-based participatory research (CBPR). By engaging providers in the research process, researchers gain

insight into the clinical issues and needs of community-based practice settings, obtain provider input on study design and the feasibility of implementation, and discover the tacit practice-based knowledge that exists in community-based practice settings and the acceptability of the intervention. CBPR promotes a sense of trust and ownership that enhances providers' acceptance of clinical research results and strengthens their commitment to acting on research findings. However, CBPR does not occur spontaneously or effortlessly.

Keys to Success

Substantial federal commitment exists to develop and support PBRNs as a means for improving and advancing the nation's research agenda as well as disseminating and implementing evidence-based clinical services in community settings. Yet reports indicate that PBRNs themselves are encountering challenges to implementation and sustainability. Several studies have elucidated characteristics that are associated with successful performance of PBRNs and the challenges they face, including developing a research agenda, obtaining member buy-in and sustaining member interest, consistently obtaining sufficient funding, creating a clinical research infrastructure, and coping with regulatory compliance issues.

Perhaps the most fundamental characteristics associated with PBRN success is the commitment of both the lead- and coinvestigators and their continuous active involvement in the PBRN. These individuals must establish a clear vision for the organization, typically in the form of scientific focus, goals, and priorities. They must also keep a close watch on the environment and remain open to new ideas and ways of remaining energized and at the forefront of research, including through continually developing new relationships with new investigators. They must also develop the relationship both inside and outside the PBRN, including those partners with the relevant patient populations, the prospective partners who would interact with those populations, and the funding groups or agencies that support the ongoing infrastructure necessary to conduct the research. Indeed, the sustainability of PBRNs has been strongly and directly tied to the ability to acquire ongoing sponsorship of research, which can be a very costly endeavor.

For all practical purposes, PBRNs cannot function without independent funding. Traditionally, clinical practice has cross-subsidized concomitant clinical research; however, this is no longer sustainable because the healthcare environment increasingly emphasizes efficiency as well as increasingly complex, burdensome, and resource-intensive research and regulatory requirements. Lack of such resources has had a negative impact on PBRNs' abilities to pursue specific lines of research and on some PBRNs' abilities to complete already initiated studies. The pressures and uncertainty of obtaining new and ongoing funding are ever present, and the time spent seeking funding displaces the time that could be spent performing the research. Restrictions placed on some funding sources can further limit how and where PBRN efforts are directed. Some PBRNs receive stable funding through federal support, which mitigates some of this pressure and uncertainty, and enables more consistent operations, while some PBRNs take as much of a business perspective as a research perspective when determining research agendas and carrying out research, as they constantly focus on costs and efficiency of operations.

In addition to being costly, clinical research is time-consuming. Investigators in PBRNs often experience exceptional time pressure because they are often also responsible for maintaining a viable clinical practice. These investigators often have little or no directly supported time to develop or conduct research, let alone analyze study data or develop and publish the findings. As such, their success is often tied to their ability to create an organizational infrastructure to support the many time-consuming aspects of clinical research. PBRN member provider organizations often must implement systemic changes in organizational staffing, office workflow, information systems, and reward structures to appropriately encourage staff support and participation and operational success. Some PBRNs have a more centralized model, where the research staff is funded in dedicated support of research, operate out of a central nonclinical office setting, and only interact with clinical staff to identify and enroll patients and carry out the strictly research-related aspects of study participants' otherwise usual course of care. Some PBRNs, on the other hand, employ a more decentralized model in which the same staff members support both patient

care and the requirements of the clinical research protocol. In either case, two infrastructure elements, good staffing and strong information technology (IT), remain key components to success.

Successful PBRNs consistently extol the value of a well-trained staff to carry out the many specialized functions within the PBRN. These roles include data managers and statistical support staff who assist in the development of research protocols and also help manage and analyze data, research nurses who interact with study participants, administrative staff who help ensure that all sorts of regulatory requirements, including interactions with local institutional review boards (IRBs) and government agencies such as the Food and Drug Administration (FDA), are met, and study coordinators and managers who oversee and coordinate all these roles. To fulfill these roles, PBRN staff efficiency, effectiveness, and general productivity are often influenced by having IT systems.

As it pertains both to internal PBRN operations as well as PBRN interaction with sponsors and other agencies, many recent advances in IT have been facilitators of PBRN success. With many PBRNs spread across multiple states and even multiple countries, the utility of an IT resource for communication and operations support is obvious. New government-sponsored IT resources such as the Clinical Trials Support Unit (CTSUs), cancer Biomedical Information Grid (caBIG), Network for Effective Collaboration Technologies through Advanced Research (NECTAR), and other resources have facilitated access to information on clinical trial availability, contributed to relieving the regulatory burden of trial participation for practitioners, and allowed much greater consistency and efficiency in participant enrollment and ongoing trial management. Some other, more forward-looking research programs have begun to develop patient-centric IT systems in which patients enter responses to trial-relevant questions on checking in for a clinic visit. With implications for practice at both AMCs and community-based practices, these data are stored for trial analysis with other patients' responses. Additionally, they are analyzed in real time to inform and improve practice immediately by both providing useful educational information to participants or patients and also informing the care provider regarding the most pertinent matters to address during the concomitant clinic visit.

Future Implications

PBRNs have broadly demonstrated their success in allowing access to new populations and enhancing enrollment in clinical trials. To cite just one example, a National Cancer Institute (NCI) PBRN, the Community Clinical Oncology Program, has allowed a successful expansion from cancer treatment trials into cancer prevention and control trials. In addition to effectively opening the door to prevention trials, it currently accounts for 30% of all enrollments to treatment trials sponsored by the NCI.

Although many PBRNs have shown that they can complete studies and advance medical knowledge, the extent to which PBRNs actually promote the use of evidence-based clinical services in community-based practice settings remains largely unknown. The few studies that have been done have demonstrated a benefit of enhanced utilization of new therapies for nontrial patients compared with patients in practices that do not do clinical research. The scope, details, and generalizability of these relationships largely remain to be proved, since many PBRNs are too new, too small, or lack reliable outcome data to measure their impact as a model for dissemination. With the NIH Roadmap's recent emphasis on PBRNs, a growing opportunity exists to conduct empirical evaluations of the benefits of PBRNs in terms of their ability to directly influence clinical practice and facilitate the translation of research into practice.

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See also Academic Medical Centers; Clinical Practice Guidelines; Community-Based Participatory Research (CBPR); Evidence-Based Medicine (EBM); Quality Indicators; Quality of Healthcare; Randomized Controlled Trials (RCT); White, Kerr L.

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Center for Participatory Research (CPR):
<http://hsc.unm.edu/som/fcm/cpr>

National Institutes of Health (NIH): <http://www.nih.gov>
Networks for Clinical Research:

<http://www.clinicalresearchnetworks.org>

PUBLIC HEALTH

Public health involves promoting health and preventing disease for all people in a community. The mission of public health is to promote health and mental health and prevent disease, injury, and disability for all the inhabitants of a community or other jurisdiction. Society has an interest in protecting its population and making assurances to that population that the society will endeavor to create conditions for all people to be healthy. Public health practitioners carry out the mission of public health through assessment, policy development, and the application of the essential public health services. The vision of public health is to promote a healthy people in healthy communities agenda. At a scientific level, this means that research and practice will be oriented to preventing disease before it occurs (primary prevention), finding ways to prolong life, encouraging healthy lifestyles with individual responsibility for maintaining these lifestyles, and developing a public health system that promotes health for all its population through organized community efforts

and collaboration. This latter point is tied to a major concern about health equity for all. At a practice level, this agenda would also be pursued by preventing epidemics and the spread of disease, protecting people from environmental hazards, prevention of injuries, responding to disasters and helping people and communities in the recovery period, and assuring accessibility of health services for everyone. Public health is thus population based and not generally a provider of clinical services. Public health agencies work with other community health partners to carry out the mission of public health and a vision for a healthier future.

Major Functions and Essential Services

Public health has 3 major functions and 10 essential services that will successfully impact a local public health system. The first function is *assessment*, which involves the identification of health problems in a community and a determination of all quantitative and qualitative considerations of that problem. The function of *policy development* involves the creation of solutions and action steps with appropriate rules, regulations, statutes, and laws, and protocols related to these solutions. The final function involves *assurance*, which relates to the implementation of the solutions in the area of action.

A clarification of these core functions involves the public health system carrying out the 10 essential public health services:

1. Monitor health status to identify community problems.
2. Diagnose and investigate health problems and health hazards in the community.
3. Inform and educate people about health issues and empower them to deal with the issues.
4. Mobilize community partnerships to identify and solve health problems.
5. Develop policies and plans that support individual and community health efforts.
6. Enforce laws and regulations that protect health and ensure safety.
7. Link people to needed personal health services and ensure the provision of healthcare when otherwise unavailable.

8. Ensure a competent public health and personal healthcare work force.
9. Evaluate effectiveness, accessibility, and quality of personal and population-based services.
10. Conduct research for new insights and innovative solutions to health problems.

Structure of the American Public Health Service System

Most public health agencies in the United States are found at the state and local levels. Although the American public health system tends to be decentralized, with different structures between states and localities, it is possible to see a public health presence at the national level. The U.S. Public Health Service includes the Office of Public Health and Science (OPHS) and eight operating agencies. These agencies are (1) the Health Resources and Services Administration (HRSA), (2) Indian Health Service (IHS), (3) Centers for Disease Control and Prevention (CDC), (4) National Institutes of Health (NIH), (5) Food and Drug Administration (FDA), (6) Substance Abuse and Mental Health Services Administration (SAMHSA), (7) Agency for Toxic Substances and Disease Registry (ATSDR), and (8) the Agency for Healthcare Research and Quality (AHRQ).

There are also 10 Regional Health Administrators for the federal regions of the country. Under Section 330 of the Public Health Service Act, there are also a number of Community Health Centers (CHC) around the country that provide ambulatory healthcare in areas where there are few health services for a population or a special needs population. These centers coordinate federal, state, and local resources to deliver health and social services to a designated population. The federal government also provides funds to the states for designated program development, such as HIV/AIDS programs. In fact, the federal government is the largest purchaser of health-related services.

All 50 states have a public health presence within some state agency. State public health agencies are either freestanding or units of a multipurpose health and human services agency. These agencies are responsible for identifying and meeting the health needs of the residents of the states. They are often responsible for monitoring federal

funding in the state. However, the subdivisions within state agencies are not common among all states. For example, environmental public health programs may be in a different agency than population-based programs. In Illinois, for example, family health programs are in the Illinois Department of Human Services and not in the Illinois Department of Public Health. State health agencies are involved in a range of activities from drinking water regulation; vital statistics and epidemiologic surveillance; food safety; tobacco prevention and control; Women, Infants, and Children (WIC) programs; health professions licensing; health facility regulation; medical and forensic examination; public health laboratories; mental health; drug and alcohol abuse prevention; environmental health and regulation; and Medicaid.

On a day-to-day basis, most of the work of public health professionals is carried out at the local level. It is estimated that there are about 3,200 local health departments in the United States at the regional, district, county, or municipal level. About 60% of these local health departments are county based. The remainder are city-county agencies, multicounty agencies, or some other hybrid. In terms of governance, these entities are either a freestanding part of the local government, a local agency where all staff are part of the state agency, a mixed model with both state and local shared responsibility, a mixed pattern, or, in a few instances, a not-for-profit agency such as a hospital contracting with the local government to manage the public health programs of the jurisdiction. Most local health departments are small organizations. About 70% serve a population of 50,000 or less. More than 80% of these agencies are associated with a local board of health.

In recent years, there has been an initiative to develop an operational definition of a functional local health department. In concert with this activity, there has been an initiative to develop a voluntary national accreditation process for local health departments. Some experts believe that an operational definition may lead to a reduction in the number of local health departments as some smaller programs consolidate with other local agencies or other small agencies into some regionally based model. Regardless of structure or pattern of governance, a functional health department

would need to meet certain standards, such as the following:

- Understand the specific health issues confronting the community.
- Investigate health problems and health threats.
- Prevent, minimize, and contain adverse health effects from communicable diseases, disease outbreaks from unsafe food and water, chronic diseases, environmental hazards, injuries, and risky health behaviors.
- Lead planning and response activities for public health emergencies.
- Collaborate with other local responders and with state and federal agencies to intervene in other emergencies with public health significance.
- Implement health promotion programs.
- Engage the community to address public health issues.
- Develop partnerships with public and private healthcare providers and institutions, community-based organizations, and other governmental agencies engaged in services that affect health to collectively identify, alleviate, and act on the sources of public health problems.
- Coordinate the public health system's efforts in an intentionally noncompetitive and nonduplicative manner.
- Address health disparities.
- Serve as an essential resource for local governing bodies and policymakers on up-to-date public health laws and policies.
- Provide science-based, timely, and culturally competent health information and health alerts to the media and the community.
- Provide its expertise to others who treat or address issues of public health significance.
- Ensure compliance with public health laws and ordinances using enforcement authority when appropriate.
- Employ well-trained staff members who have the necessary resources to implement best practices and evidence-based programs and interventions.
- Facilitate research efforts, when approached by researchers, that benefit the community.
- Use and contribute to the evidence base of public health.
- Strategically plan its services and activities, evaluate performance and outcomes, and make adjustments as needed to continually improve its effectiveness, enhance the community's health status, and meet the community's expectations.

These standards are closely allied to the core functions and essential public health services discussed above. These standards can serve as guidelines for the fundamental responsibilities of the local health department. They also will be critical in any agency accreditation process.

Public Health Workforce

The public health workforce is composed of individuals from diverse backgrounds, education, and training in fields including medicine, nursing, psychology, social work, epidemiology, biostatistics, laboratory science, law, public administration, business, economics, pharmacy, veterinary medicine, social sciences, education, and public health. This diversity serves both as strength and a weakness in the definition of public health and in the dimensions of how to carry out the work of public health. The U.S. census reports about 250,000 full-time equivalent health workers employed by local governments. In 2004, there were about 550,000 full-time equivalent workers in the governmental sector at the federal, state, and local levels. In a more recent survey of the public health workforce in local public health departments, it was estimated that there were 160,000 in 2005. Managers and administrators constitute about 6%, nurses 24%, environmental specialists/scientists 10%, clerical staff 27%, health educators 3%, nutritionists 3%, and other designated health professionals such as physicians constitute about 4%; the remaining 23% are uncategorized workers. With regard to physicians, it is estimated that there will be a need for 10,000 more public health physicians in the coming decades than we have now. Currently, there are about 10,000 public health physicians.

It is also estimated that there will be critical shortages of public health nurses, environmental

health specialists, health educators, epidemiologists, and information technology (IT) specialists in the future. Since September 11, 2001, there has been an increase in the number of public health workers involved in emergency preparedness and response. As federal funding for these activities declines, it is predicted that there will be some decline in the governmental public health workforce.

Public Health Education Programs

Although there are many individuals in the public health workforce, many have not been specifically trained in public health. Schools of public health and public health programs that are accredited by the Council on Education for Public Health (CEPH) provide academic training in public health. Currently, there are 39 accredited Schools of Public Health and 67 accredited graduate public health programs in the United States. All the schools have curricula that are competency based. A credentialing process has been developed to credential master's of public health (MPH) graduates of the schools and other accredited public health programs. The first credentialing examination was held in the summer of 2008.

There are a number of core competencies that have been developed to demonstrate the skills that are needed for successful public health practice. These competencies include analytic/assessment skills; policy development/program planning skills; community dimensions of practice skills; basic public health sciences skills; communication skills; cultural competency skills; financial planning and management skills; and leadership and systems thinking.

Prior to 2002, five major curriculum content areas were designated as important for public health practice: (1) biostatistics, (2) epidemiology, (3) environmental health sciences, (4) health services administration, and (5) social and behavioral sciences. A number of educational programs also included content on community health and laboratory sciences.

During this first decade of the 21st century, the national Institute of Medicine (IOM) has strongly advocated the addition of a number of other content areas that are critical for public health practice in the new century. They have identified 11

additional content areas: (1) informatics, (2) genomics, (3) communication, (4) cultural competence, (5) community-based participatory research, (6) global health, (7) policy and law, (8) ethics, (9) leadership, (10) public health emergency preparedness, and (11) clinical and community preventive services.

Public Health Emergency Preparedness

Since the terrorist attacks of September 11, 2001, emergency preparedness and response have become major activities for local public health departments. These local entities have significantly increased their ability to address public health emergencies with federal funding from the Centers for Disease Control and Prevention (CDC). Whereas only 20% of local health departments had comprehensive emergency response plans in 2001, more than 90% have such a plan in late 2007. Funding is beginning to be cut, with concern about the ability to maintain this emergency preparedness momentum in the future. About 20% of local health departments hold that they are fully prepared now, and 77% hold that improvements have been made since 2001. Since 2005, funding has declined by almost 30%. With these funding cuts, local public health agencies have had to cut or lay off staff. Workforce training programs have been curtailed as a result. More than 55% of local public health agencies do not think that they can achieve their deliverables within the designated time frames. In addition, local public health agencies are finding it difficult to find and hire emergency preparedness planners, epidemiologists, and nurses. The only positive element has been an increase in funding for pandemic influenza planning. Staff have been redeployed to address this new health priority.

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See also American Public Health Association (APHA); Centers for Disease Control and Prevention (CDC); Community-Based Participatory Research (CBPR); Community Health; Community Health Centers (CHCs); Emergency and Disaster Preparedness; Epidemiology; Preventive Care

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- Council on Education for Public Health (CEPH):
<http://www.ceph.org>
- National Association of County and City Health Officials (NACCHO): <http://www.naccho.org>
- Trust for America's Health (TFAH):
<http://www.healthyamericans.org>

PUBLIC HEALTH POLICY ADVOCACY

Almost every decision made by policymakers influences public health. Whether a given policy is directly related to healthcare, or whether it indirectly affects human health or the environment, public health advocates must be cognizant of the policy-making process and how to influence that process. Examples of issues affecting public health range from environmental regulation to education policy and from transportation projects to consumer protection. And, of course, key to public health policy analysis are issues involving access, costs, and quality of healthcare.

Developing a Policy Action Plan

To advocate for a public health policy, a policy action plan should be developed. The basic issues for developing such a plan are discussed below.

The "Commodity" of Information

For each issue, information must be collected, analyzed, assimilated, and delivered. A Policy Action Plan should be developed to clearly and concisely provide a strategy for consensus building. Types of information to be collected include data from research-based studies, epidemiological studies, and cost-benefit analyses as well as information about previous policy approaches to addressing the issue from other jurisdictions, and adopted policies. Information about policymakers should also be collected. Who cares most about this issue? Why? Can they assist in advocacy efforts? Advocacy channels are also a key consideration. Is the issue best addressed by legislators, or should relief be sought through administrative routes?

Legislative Branch

Most policy-making venues have both legislative and executive branches. Understanding how to navigate through the policy-making infrastructure is key to effective policy advocacy. On the legislative

side, advocates need to familiarize themselves with the bill-making process, committee structures, and individual legislators and their staff. Each jurisdiction has slightly different rules for how a bill becomes law. Key legislative committees will include those relating to healthcare, public health, health disparities, education, justice reform, environment, and transportation, to name a few. Appropriations committees often operate under a different set of rules that may significantly influence how programs are funded and administered.

Executive Branch

On the executive side, policy advocates need to understand the agency structure, the rule-making process, and key administrators. Executive branches at the local, regional, state, and federal level often mirror each other. For instance, at the federal level, the U.S. Department of Health and Human Services (HHS) houses most of the key public health and healthcare agencies, including the Centers for Disease Control and Prevention (CDC) and the National Institutes of Health (NIH). At the same time, most federal funding flows through state departments of health and human services, which have subagencies for each relevant funding stream.

The administrative rulemaking process determines how funds flow to various agencies and the rules under which those funds will be distributed. At the federal level, information on the rulemaking process is found in the *Federal Register*. Typically, each state's administrative code can be accessed through the state's official Web site. While many localities also house their ordinances and local rules online, advocates may be required to make the trip to city hall to obtain a copy of relevant regulations.

Identifying Stakeholders

Effective public health policy advocacy must include an analysis of the various stakeholders. The inquiry should begin by identifying the proper venue for advocacy. Is the issue best addressed at the local, state, country, or international level? For example, if the issue concerns children's health in

school, it may be best to seek out solutions at the local school level. If the issue concerns county health departments, it may be most effective to advocate the issue with the proper county policymakers. An effective advocate will determine which local or regional policymakers chair the relevant committees, which ones are passionate about the topic, which ones have direct experience with the topic, and so on. The same analysis holds true with issues at the state, federal, and international levels.

Identifying external stakeholders is another important exercise that policy advocates must undertake. What constituency and interest groups will support or oppose the initiative? Which organizations will take a lead role in assisting in advocacy efforts? Other external stakeholders, including private-sector organizations such as hospitals, healthcare systems, insurance companies, and pharmaceutical companies, should also be catalogued as potential advocacy channels. Which organizations' Web pages, newsletters, or events can be used for advocacy? Advocates should also research private funders, including nonprofit foundations and corporate foundations, to determine opportunities to leverage funding.

Delivering Information/Direct Advocacy Channels

Often, advocates have opportunities to discuss their issue directly with policymakers. A single meeting, if handled correctly, can have a tremendous impact on the policy-making process. Direct advocacy channels range from formal meetings to happenstance encounters at, say, the pharmacy. Most often, formal meetings can occur in an elected policymaker's capital or district office. Careful consideration should be given to where the meeting occurs and who attends. Elected policymakers are often passionate about public health issues and can easily be approached to discuss a specific issue. Most direct advocacy opportunities, however, will occur in a short meeting; advocates must be well prepared to maximize the contact.

Formal and informal meetings with administrative policymakers are an often overlooked opportunity for effective issue advocacy. Regulators are generally well informed about the intricacies of the

policy-making process as well as the complexities of implementing policies on particular issues. Establishing relationships with regulators can provide unmatched advocacy opportunities, particularly when the individual has a direct interest in the issue or where the affected agency has the issue as a core competency.

Advocacy Tools

In addition to direct contact with policymakers, advocates deliver information in various written formats. The most widely used written document is a fact sheet—a one-page summary of the issue, recommended action, and rationale for the proposed action. Fact sheets should also include a messaging component as well as a clearly articulated summary of the request. Other written advocacy tools include issue papers, correspondence, letters to the editor, brochures, and Web pages, to name a few. Policymakers pay significant attention to handwritten letters from their constituents. Other types of letters include form letters signed by individuals and those listing supporting organizations. In addition to written communications, advocates sometimes use messaging tools such as pins and bumper stickers.

Future Implications

To be most effective, public health policy advocates should carefully map out a policy action plan for each issue. Methods for collecting, analyzing, assimilating, and delivering relevant information to policymakers at the local, regional, state, national, and international levels should be carefully considered. Tools for advocacy should include face-to-face meetings as well as written communication. Meetings should be short, and written documents should be clear and concise. Without question, public health policy advocates can influence the policy-making process on significant issues relating to healthcare, health disparities, and the environment, among others.

William C. Kling

See also Equity, Efficiency, and Effectiveness in Healthcare; Forces Changing Healthcare; Healthcare Reform; Health Disparities; Public Health; Public Policy; Regulation

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- Henry J. Kaiser Family Foundation (KFF):
<http://www.kff.org>
- National Association for Public Health Policy (NAPHP):
<http://www.naphp.org>

PUBLIC POLICY

Public policy represents the codification of mainstream values. Policy comes in the form of legislation, regulation, executive decisions, budget allocations, and court decisions. Public policy represents the official direction or pronouncement of governmental institutions (the legislature, executive, or judicial branches) on a particular subject or issue. In the United States, public policy is promulgated at the federal, state, and local levels of government by elected and appointed officials. As mainstream values change over time, so does public policy. This change may be the result of elections, interpretations of the courts concerning legislation, lobbying, or public opinion. Policy represents the product of a priority-setting process. Public policy in the area of healthcare, therefore, represents the official decisions of government on access, allocation of resources, delivery, financing, and organization of healthcare services.

Basic Premises

In the United States, the basic value at the foundation of public policy concerning healthcare is that

healthcare is not a legal right of citizenship. Instead, healthcare is considered to be a privilege usually associated with a benefit of employment. Only for those 65 years of age or older and those with very low incomes has the nation created a legal entitlement to health insurance coverage, thus establishing a right to healthcare for these citizens.

The basic model is that healthcare is an individual, private responsibility for all those in the age range of 18 to 65 whose incomes do not fall below the poverty line and who are not disabled, veterans, American Indians, or Alaska Natives.

The U.S. healthcare system stands out in two other ways, which also reflect mainstream values. The first is that it devotes the largest share of its gross domestic product (GDP) to healthcare in contrast to other developed nations. In the middle of the 20th century, less than 5% of its GDP was devoted to healthcare. That percentage rose to nearly 14% by the end of the century. Yet the system does not necessarily produce superior health outcomes (e.g., low infant mortality or greater life expectancy). The second unique feature of the U.S. healthcare system is that it is not based on some form of universal healthcare. The system relies, for the most part, on private healthcare providers with a mix of private and public insurance as well as extensive government regulatory intervention.

Policy-Making Process

Policy is the product of a process consisting of the following stages: (a) problem definition; (b) formulating options for consideration; (c) debate and deliberation over the available options; (d) adoption of a particular option; (e) implementation of the selected option, including appropriation of resources to support the option; and (f) assessment or evaluation. This process may vary depending on which political institution or level of government is involved.

Legal and Regulatory Foundations

Much of public policy since World War II in the healthcare area can be traced to changes in laws and regulations related to healthcare. These policies relate to access, financing, organization, and service delivery. Taken together, these laws and regulations represent public policy in American healthcare.

Hospital Expansion

After World War II, President Truman assigned a high priority to health insurance. He built on the proposals developed in 1938 and included the following components: expansion of hospitals, increased support for public health, support for maternal and child health services, increased federal support for medical research and education, and, most significantly, a single health insurance program to provide coverage for all segments of society. These reforms were defeated for the same reasons and by the same coalition that had defeated these kinds of proposals in the past.

It was, however, during the Truman Administration that part of his vision was realized: the expansion of hospitals. The U.S. Congress passed the Hospital Survey and Construction Act, also known as the Hill-Burton Act of 1946, which provided for \$1 dollar of federal funds for every \$2 spent by states in the construction of community-based hospitals.

With the defeat of the various proposals for universal health insurance coverage between 1915 and 1946, the post-World War II era in healthcare was characterized by an expansion of Blue Cross and Blue Shield and other commercial insurance products as well as an increase in prepaid, direct service plans, such as the one developed by Henry Kaiser.

Medicare and Medicaid

With the passage of the Title XVIII (Medicare) and Title XIX (Medicaid) amendments to the Social Security Act in 1965, the role of the federal government was fundamentally changed. These programs represented a major change in the government's approach to the design, financing, and delivery of healthcare. As part of the New Frontier, President Kennedy had flirted with the reintroduction of a national health insurance proposal. President Johnson, subsequently, succeeded in the enactment of Medicare, which provided an entitlement to every citizen who reached the age of 65. Part A of the Medicare program (i.e., reimbursement for inpatient, hospital-based treatment) was mandated, and Part B (i.e., outpatient care and reimbursement for physicians) was to be voluntary. Between 1965 and 1985, Medicare helped

restructure financing and reimbursement policies for all the American healthcare system and not just for this particular program, because private insurance companies adopted reimbursement policies that were indexed to Medicare.

Medicaid represented a federal-state partnership to provide medical services to low-income individuals who meet the eligibility criteria. The theory behind Medicaid was that eligible individuals should be given the buying power in the healthcare marketplace that would provide free choice of providers and open-ended reimbursement, based on reasonable costs and fee-for-service, for noninstitutional providers. The statute also provided nonhospital providers with the choice to accept or reject Medicaid patients. The program provided for a core minimum set of services that all states must provide and a second set of services that states had the option to provide.

Health Maintenance Organization Act

Subsequent to Medicare and Medicaid, the U.S. Congress enacted the Health Maintenance Organization (HMO) Act of 1973. This statute represented a new approach in federal healthcare policy: It was an attempt to gain control over healthcare pricing by encouraging the development of fully integrated healthcare organizations that imposed vertical controls on the cost of services furnished to their member providers. Congress envisioned that 1,700 HMOs would be developed by 1976, but only a fraction of that number was ultimately developed. This innovative legislation, proposed by the Nixon Administration, foresaw a trend in American healthcare that would ultimately become quite popular in the 1990s. In 1988, for example only 25% of those with employer-based insurance were enrolled in managed-care plans; by 1997, the number increased to 80%.

Emergency Medical Treatment and Active Labor Act

Federal involvement in healthcare was augmented in 1986 with the enactment of the Emergency Medical Treatment and Active Labor Act (EMTALA). This statute was a response to the growing problem of access to healthcare in the United States. This law was also in response to what appeared to be a grow-

ing trend of hospitals not providing treatment to those who could not afford to pay for the services they were receiving. EMTALA requires hospitals that are receiving any Medicare revenues (which includes almost all the hospitals in the nation) to provide treatment to all patients seeking care for emergency medical conditions regardless of the ability to pay and regardless of their eligibility for Medicare. The statute requires hospitals to provide patients with "appropriate medical screening," and patients must also be stabilized, before they can be transferred to another facility.

At approximately the same time, there was increasing concern in the public and private sector alike over the rising costs of healthcare and more intensive skepticism over the effectiveness of the traditional fee-for-service system. This system was considered to be user-friendly, allowing for flexibility and discretion for providers and patients alike. However, it did not seem that it could control costs. Health insurance premium increases, for example, of 15% to 20% per year were commonplace in the mid- to late 1980s. In 1990, when employer-sponsored group insurance premiums increased "by only 14%," this was considered to be good news, because they had risen by 24% in the previous year. This inability to control cost increases was considered to be the fatal flaw of the fee-for-service system.

This indictment led to the increased popularity of managed-care arrangements. The term *managed care* encompasses a broad range of healthcare organizational arrangements that are intended to eliminate unnecessary and inappropriate care and to reduce costs. The basic theory of managed care is to control costs by restricting access and services while maintaining quality. The basic features of managed care include contractual arrangements with selected providers to furnish a comprehensive set of healthcare services to its members, significant financial incentives to steer patients toward providers and treatments/medical procedures within the plan, and ongoing accountability of providers for their clinical and financial performance through formal quality assurance and utilization review. A central feature of managed care is the use of a limited number of providers who are selected on the basis of their clinical-practice patterns and specialty and their acceptance of financial incentives for cost conscious utilization of resources.

These managed-care arrangements allow for the provision and financing of healthcare in a structure substantially different from the accepted fee-for-service arrangement, and they enable managed-care organizations to take an active role in monitoring and controlling the amount and type of services provided to patients by physicians and other caregivers. They differ in the amount of financial risk that the managed-care organizations assume, the way they share risk with providers, the restrictiveness of the provider policies, and the level of out-of-pocket costs that the beneficiaries bear.

Health Security Act

With the growing concern over costs, the critique of the fee-for-service system, and the growing popularity of managed care, healthcare became a campaign issue in the 1992 presidential race. Following his election, President Clinton introduced a comprehensive proposal (Health Security Act [HSA] of 1993) to reform the American healthcare system. The proposed legislation began with the premise that healthcare was a legal right for all citizens. This act envisioned universal access to healthcare for all citizens. It used principles of managed competition to increase access and quality of healthcare at the same time. The plan was to restructure the financing and delivery of services through providing incentives to private insurance companies, enabling the formation of small groups and purchasing cooperatives, and by increasing the role of government in providing access and services, as required. During this same time period, at least 10 alternative proposals to reform the nation's healthcare system were introduced by members of the U.S. Congress. None of these proposals, including the HSA, were adopted.

Health Insurance Portability and Accountability Act

The debate over Clinton's proposed health plan, did, however, highlight some of the problems of the nation's healthcare system. This recognition led to the adoption of the Health Insurance Portability and Accountability Act (HIPAA) of 1996. HIPAA provides for continued health insurance coverage for individuals who might otherwise lose their coverage as part of a group plan (e.g., for leaving one

job to accept another). It also bars exclusionary practices of insurance companies that are designed to deny coverage to individuals who are bad risks because of preexisting medical conditions.

Employee Retirement Income Security Act

State government has traditionally held the right to regulate the insurance industry. Insurance law, certification, and licensing requirements have provided states with a measure of control over the healthcare industry. However, in 1974, the U.S. Congress passed the Employee Retirement Income Security Act (ERISA), a comprehensive, uniform national system for employee benefit plans, which mandated inclusion of healthcare benefits. ERISA provisions have resulted in preemption of state initiatives, especially those oriented at universal coverage provided through employer mandates. In addition, ERISA has often been interpreted by the federal courts to preempt virtually all of the vast body of state insurance, contracts, and other laws or regulations applicable to healthcare plans.

As already indicated, the focus of healthcare policy and law since 1930 has been containment of healthcare expenditures. Cost containment efforts have led to a transformation in the organization and financing of the American healthcare system, with the government-financed Medicare program serving as a standard for reimbursement. However, neither the cost-containment initiatives nor the new programmatic statutes such as EMTALA or HIPAA have addressed what many employers, consumers, and third-party payers consider to be the major flaws with the traditional fee-for-service system. This has led to the growing acceptance of managed care.

National data suggest that managed-care organizations are substantially more efficient than indemnity plans in controlling costs. The average premiums paid for by employers for health benefits decreased substantially between 1989 and 1999. Health insurance premiums began to increase again over the past several years. It could be argued that these rate increases are linked to the negative impact of regulation on managed care. In 1989, the average premium increase per year was 18%, and by 1996 it was only 1%. The sweeping changes in the organization and financing of the healthcare system can be attributed to the spread of managed care.

However, the growing reliance on managed care in the private marketplace and in Medicaid programs was also accompanied by consumer and provider dissatisfaction with these new financing, administrative, and organizational arrangements. Providers and consumers have advocated for a larger panel of providers in managed-care networks and less restrictiveness on stepping outside the network to obtain reimbursable medical services from nonnetwork providers. Consumers are looking for less restricted access to providers than they have in many managed-care plans. Providers, being shut out of selective contracting and fearing loss of income from the closed panels of managed-care organizations, are advocating for unrestricted access for patients. Providers are also demanding that the administrators of these organizations remove themselves from, in effect, making therapeutic decisions that result from financing decisions. For example, providers and consumers alike strongly object to so-called gag clauses, which prevent providers from informing patients about treatment options that the managed-care plan does not cover; to policies that limit hospital stays for childbirth; and to restrictions on patients' rights to sue managed-care organizations for denial of needed care.

In response to the growing criticisms of managed care by providers and consumers and the increasingly adverse coverage of managed care by the popular press, state legislatures and the U.S. Congress began to respond with a regulatory strategy. Since the defeat of the Clinton healthcare reform proposal, states have taken the lead in enacting a set of laws limiting the flexibility of managed-care organizations in their contracting for and delivery of services.

The specific features of managed-care regulation vary from state to state, but the types of regulation can be divided into two categories: (1) laws that regulate the relationship between managed-care organizations and healthcare providers and (2) laws that regulate the relationship between managed-care organizations and healthcare consumers.

Laws that regulate the relationship between managed-care organizations and healthcare providers affect how the organizations select, deselect, compensate, and control the physicians whom they employ directly or contract with to provide healthcare. These include laws that limit the ability

of managed-care plans to direct the flow of patients to specific providers, prohibit contracts between managed-care plans and provisions that establish exclusive relationships (contracts that do not permit providers to sign contracts with other managed-care plans), and mandate that any provider willing to meet the price terms of the health plan must be accepted into the network—the so-called Any Willing Provider legislation (statutes that stipulate that any provider who meets the criteria for inclusion in a managed-care organization's network must be given the opportunity to join the managed-care organization); at least 14 states have enacted comprehensive Any Willing Provider laws, and another 14 states have enacted more limited versions of these laws.

Proposed laws that regulate the relationship between managed-care organizations and healthcare consumers include legislation that would allow patients direct access to specialists without a referral (the so-called direct access laws), which mandates a minimum stay in hospitals for births and other procedures, and that allows enrollees to sue managed-care organizations for refusing necessary treatment.

The commonality between these various forms of managed-care regulation is that they all focus on issues of cost and access. A central feature of managed care's ability to restrain the rapid rise of healthcare costs is its restriction on access and choice. Managed care restricts access through the use of a limited number of providers who are selected to be part of the plan and through the use of financial incentives to steer patients to providers who are part of this plan. Elimination or restraint of either of these features significantly affects the ability of the managed-care organization to control costs. Issues of increased access to a broad set of providers and, hence, increased choice and cost control appear to be mutually exclusive if one is trying to adhere to principles of managed care.

The plethora of anti-managed-care regulations put forward appears to be a disjointed attempt by state legislators to satisfy disgruntled constituencies by violating the fundamental principles of managed care that can make it successful. The continued pressure on state legislatures to respond to constituent pressure for relief from managed-care restrictions is not the only issue healthcare reformers will face in the future. Insurance premium costs

are increasing after several years of slow or flat growth. It could be argued that these rate increases are linked to the negative impact of regulation on managed care. While managed-care penetration into the healthcare market increased in the 1990s, will rising costs cause employers to discontinue healthcare coverage for their employees or shift ever-larger portions of healthcare costs onto them? Growing numbers of healthcare purchasers are opting to move into self-insured plans; this is done, in part, to avoid state regulation. Self-insurance plans “protect” employers from state regulation because of the ERISA preemption.

State Policy

Public policy in the arena of healthcare has not only been formulated at the national level, but there also have been policies promulgated in the states. In the past decade or so, the majority of states have passed legislation regulating the issuance, content, and pricing of private group health insurance plans. The purpose of this legislation is to increase the number of insured persons by expanding and securing coverage and to ensure that those who are sick receive the appropriate care. A variety of factors have motivated these laws. One prominent reason for states’ aggressive regulation of the private health insurance market was the large number of uninsured individuals who were employed. In 1987, prior to the implementation of many of the regulations, there were 23 million uninsured individuals between the ages of 18 and 64, many of whom were employed. Moreover, there was a significant increase in the number of uninsured workers in small firms during the latter half of the 1980s. Many believe that insurance industry practices such as experience rating and redlining (i.e., refusing to sell insurance to firms deemed high risk) were major reasons that workers in small firms accounted for one out of every two uninsured workers. In response, many states limited these practices through legislation collectively referred to as small group reform.

The other major type of state (and federal) regulation is mandated health insurance benefits, regulation that requires that all group insurance plans pay for certain medical procedures and/or providers. These reforms have a longer history than small group insurance reform. They initially arose as a

response to lobbying pressures by provider groups and as a way to address possible market failures, but recent mandates have been primarily motivated by the rise of managed-care organizations. Regulation of the content of insurance plans is an attempt to counter managed-care organizations’ efforts to limit utilization. To ensure that people still receive appropriate care, states have specified the types of treatments and kinds of providers an insurance plan must cover. An example of such a mandate is minimum maternity hospital stays. The popularity of mandated benefits has grown dramatically over time. In the first 6 months of 1997 alone, more than 600 new state health insurance benefit mandates were introduced across the nation.

Future Implications

There have been debates over healthcare reform in the United States since the Progressive Era. However, large-scale reform has not been achieved. Future policy deliberations will need to address some fundamental tensions, such as balancing the need for cost containment while providing access to the growing number of uninsured individuals. They will also need to address many questions, such as the following: Can increased access be achieved without introducing mandates for employers or individuals? With increasing life expectancy, how can the costs of Medicare be brought under control? Will the United States ever commit itself to providing healthcare as a right of citizenship?

Robert F. Rich

See also Access to Healthcare; Cost of Healthcare; Healthcare Reform; Health Insurance; Medicaid; Medicare; National Health Insurance; Regulation

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Urban Institute: <http://www.urban.org>



QUALITY-ADJUSTED LIFE YEARS (QALYS)

A quality-adjusted life year (QALY) is an outcome measurement of health over time related to a disease or condition under study. The quality of life can be determined by using various tools to measure the preference toward a health state of the general public or of a specific individual or group in a certain state of disease or wellness. This measure of the quality of life in each health state is multiplied by the time spent in each health state to obtain the QALY. The QALY is not just a measure of life years but also a measure of the quality of health in each of those years, therefore a measurement of both morbidity and mortality. A QALY will be equal to or less than the total number of life years studied.

Calculation Methods

A QALY can be calculated in several ways using various methods. The quality of life can be measured using preference scales to implicitly rate the quality of health experienced by either individuals or the public in general. These tools can be either based on general attitudes or disease specific. Preference scales commonly used are the Visual Analog Scales (VASs), or feeling thermometers, the Standard Gamble (SG), and the Time Trade Off (TTO) preferences. The use of preference scales allows for the measurement of the quality

of health from the perspective of the individuals toward whom the health system is directed.

The VASs use number or category rating scales, marked or unmarked line scales, or combinations of either. While the scales vary, the final measure is transformed into a scale of 0 to 1, where 0 is *dead* and 1 is *perfect health*. The individual is presented with two choices: One is treatment, which may result in a chronic health state leading to either a better state or immediate death; the other is no treatment, therefore remaining in a chronic health state leading to death. The assumption is that the life years are longer in the treatment state. This tool could also be used with temporary health states that do not lead to death. One such scale is the Health Related Quality of Life Scale (HQRL). The HQRL uses a vertical scale, analogous to a thermometer, from 0 to 1, 10 divisions between each integer, with 0 being *dead* and 1 being *perfect health*. The subjects are asked to indicate where on the scale they feel the quality of their health lies. Another published scale using preference scores is the Quality of Well-Being Scale (QWB). The preference scores can be plotted on the vertical axis of a graph against the time spent in each score or health state with time on the horizontal axis. Integrating the area under the plotted curve is a measure of the total QALY.

The SG method measures preferences for chronic states by presenting the subject with a choice between treatment, leading to either a healthy state or death, and no treatment, resulting in a continued chronic state until death, much like the VASs. However, the time in each state, if listed

as a probability, can be altered to determine the subject's preference. SG techniques are offered by direct interview, paper, or computerized questionnaires. Any of these can be enhanced with visual aides. Variations for temporary health states can accommodate conditions not having a fatal outcome. Examples of tools incorporating SG are the Short-Form-6D and the Health Utility Index (HUI), both of which were generated from general public preferences.

The TTO method is used by the EuroQoL Group (an organization initiated in Europe to develop a common instrument for describing and assessing health and quality of life) and is similar to the SG. In this method, subjects choose between living in a certain chronic state until death and a healthy state of shorter duration until death. Or for temporary states, the subject can choose between a poor health state or one that is worse but with treatment leading to a better state. The time spent in each state can be adjusted until the subject feels about the same toward each.

Other methods include the Rosser Index and the Person Trade-Off (PTO), which is basically a TTO with the trade-off considered for others rather than oneself.

QALY measures do not look at the monetary cost of arriving at a particular state of health quality but are used in cost-effectiveness and cost-utility analyses to determine the ratio of cost to outcome or cost per QALY. In these analyses, the cost per unit of health can be measured in several ways, one of which is the cost per life year gained. When choosing an instrument to measure QALY, consideration must be given to the population used in developing the tool. Attempting a pilot test prior to choosing, or using several tools may be advisable. The resulting cost-effectiveness or cost-utility analysis may vary greatly depending on the method used to evaluate the quality of life. A thorough analysis using several methods could yield results better suited for economic evaluations. The use of QALYs is also recommended to facilitate comparisons across studies for various medical and health-care interventions. On the individual scale, a small improvement in health over many years may yield the same QALYs as a large benefit over only a few years. Similarly on the societal level, a small improvement for many people may equal a large benefit for a few individuals.

When calculating QALYs into the future, discounting of future benefits or health states can be done to gain the relative weight in the current year. With escalating healthcare costs, increasing emphasis is placed on government and private control measures, individual contributions, and universal coverage. Developing decision models using cost per QALY comparisons could assist in public and private policy-making decisions on the allocation of resources. A limitation is the long-term observation period required for the analysis of newer treatments. The ongoing collection of data sets and league tables listing costs per QALY, available in public registries, lends convenient access for such purposes.

Ann L. Viernes

See also Cost-Benefit and Cost-Effectiveness Analyses; Health Economics; Measurement in Health Services Research; Mortality; Quality of Healthcare; Rationing Healthcare; Short-Form Health Surveys (SF-36, -12, -8); Williams, Alan H.

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- Cost-Effectiveness Registry:
<https://research.tufts-nemc.org/cear/default.aspx>
 EuroQoL Group: <http://www.euroqol.org>

QUALITY ENHANCEMENT RESEARCH INITIATIVE (QUERI) OF THE VETERANS HEALTH ADMINISTRATION (VHA)

The Quality Enhancement Research Initiative (QUERI) of the Veterans Health Administration (VHA) is a multidisciplinary, data-driven, quality improvement program designed to ensure excellence in all places where VHA provides healthcare services, including inpatient, outpatient, and long-term care settings. QUERI aims to identify best practices, systematize their use, and provide the feedback necessary to maintain ongoing improvement. The National Academy of Sciences, Institute of Medicine's (IOM) seminal report *Crossing the Quality Chasm* (2001) identified QUERI as one of the nation's best examples of synthesizing the medical evidence base and applying it to clinical care.

The VHA is the healthcare delivery system for the U.S. Department of Veterans Affairs. It runs many hospitals, outpatient clinics, and long-term care facilities. One of the main offices of the VHA is the Office of Research and Development (ORD). QUERI is based within the Health Service Research and Development Service of ORD. From its onset in 1998, QUERI has been fully integrated into the VHA's strategic framework for quality management. Being within the VHA, with its central management and centralized database that is used by all its facilities, the clinicians and researchers associated with QUERI have the unique opportunity of putting their research findings into practice.

Organization

QUERI is organized into three parts: QUERI centers, a Research and Methodology Committee, and a National Advisory Council (NAC).

QUERI brings together VHA's Health Services Research and Development researchers and VHA's clinicians and administrators and provides them the unique opportunity to transfer research findings into patientwide and systemwide improvements. QUERI centers currently focus on nine conditions that are prevalent and high risk among veterans: chronic heart failure, diabetes,

HIV/hepatitis, ischemic health disease, mental health, polytrauma and blast-related injuries, spinal cord injury, stroke, and substance use disorders. Each QUERI center consists of a research and clinical coordinator and a 15-member executive committee that includes researchers and clinicians with expertise in specific areas for each center from around the country.

The Research and Methodology Committee serves as the oversight committee for the entire QUERI process. It is composed of VHA senior researchers, clinicians, and policymakers. It meets semiannually to evaluate the performance of each QUERI center by reviewing their research methods, plans, and projects. It approves requests for solicitations, and it ensures that the QUERI process is being followed by each center.

The NAC is composed of senior VHA policy leaders from the U.S. Department of Veterans Affairs' (VAs') central office in Washington, D.C. It provides general policy guidance and direction, and it ensures that QUERI is integrated into the VHA's operational policies and structure.

Process

The specific activities of the QUERI centers follow a standard process or sequence of activities that were specified at the time the centers were established. Through literature reviews and experience, six steps were identified as necessary to systematizing quality improvement in the VHA. The six steps are discussed below.

Step 1: Identify conditions associated with high risk of disease and/or disability and/or burden of illness for veterans. The QUERI leadership chose the conditions. Most of the conditions chosen were high volume and among the most common discharge diagnoses in the VHA. For two of the conditions, spinal cord injury and HIV/AIDS, the VHA is the nation's largest provider of care. The individual QUERI executive committees could choose to concentrate on specific high-priority subtopics within their condition. This was done with the approval of the QUERI leadership.

Step 2: Identify best practices. Following the identification of the disease or condition, each QUERI group identified evidence-based best-practice

recommendations and processes. For many of the QUERI conditions, a range of systematic reviews, evidence-based clinical practice guidelines, and other clinical recommendations were already available for review, refinement, and implementation. In some areas, evidence-based clinical practice guidelines were unavailable. In these cases, each QUERI center was expected to do literature reviews, evaluate care models, and use other best-practice programs. If necessary, the QUERI centers were to initiate their own research to close existing gaps in knowledge and practice. They were also encouraged to work with VHA's National Clinical Practice Guideline Council to facilitate the development of new evidence-based guidelines.

Step 3: Define existing practice patterns and outcomes across VHA and current variation from best practice. Following the identification of evidence-based best practices, each QUERI center conducted research to document and assess current VHA practice patterns and identify gaps and shortcomings in VHA policies, clinical practices, and outcomes. The VHA's national database greatly expedited this process. This process identified opportunities for improvement. Where VHA databases did not allow the collection of such data, the QUERI centers worked with VHA to refine and develop such data or tools.

Step 4: Identify and implement interventions to promote best practices. Following completion of Step 3 (which included data collection and analysis activities and the identification of important performance variations and gaps), each QUERI center worked to diagnose the cause of documented performance problems and to identify and implement programs and strategies to improve healthcare quality and outcomes. In areas where published literature provided evidence regarding promising strategies, the QUERI centers worked to adapt and implement the established strategies. In areas where such guidance was not available, the QUERI researchers designed new strategies. The specific interventions and projects conducted in Step 4 included (1) efforts to translate clinical research findings and recommendations into routine clinical practice through refinements and reorganization of clinical-practice systems and processes and (2) efforts to translate successful facility-level programs into systemwide policies and practices.

Since the field of translation research is relatively new, several coordinated efforts were launched to support and encourage the investigators associated with the QUERI centers. These included special funding and solicitations, a separate scientific review board with experience to review grant proposals from the QUERI centers, annual conferences to examine methods and processes of quality improvement and strategies for organizational behavioral change in healthcare delivery, translation consultants identified and made available to the QUERI centers, and supplemental funding made available to each QUERI center to hire dedicated translation experts (with formal training and experience in individual and organizational behavior change and quality improvement). Each QUERI center was responsible for having a plan outlining where in the six steps it was for each condition or subtopic and a separate translation plan. These plans were updated annually and reviewed by the Research and Methodology Committee.

Step 5: Document that best practices improve outcomes. An important feature of the QUERI process and a critical element in its success is its focus on measurement and improvement in patient and system outcomes. If QUERI was to promote sustained quality improvement and attain support from VHA patients, staff, managers, and external stakeholders (e.g., the U.S. Congress), it must demonstrate continued improvement in patient care and systems outcomes. Although process and structure data were also needed, outcome measurement was prioritized. Outcomes were generally measured in QUERI through a diverse set of tools and sources, including VHA's computerized data and surveys of patients, their caregivers, and VHA clinicians. Together, these sources provided a comprehensive assessment of relevant patient and system outcomes, ensuring value and helping to further refine the QUERI quality enhancement programs and other interventions implemented in Step 4. Outcomes of interest typically included mortality, morbidity, functional status, health-related quality of life (HRQOL), access, utilization, costs, and patient satisfaction. In circumstances where valid outcome measures did not exist, studies were proposed in the strategic plan, which was then reviewed, by the Research and Methodology Committee. Where appropriate, risk-adjusted

models were also developed and tested. Finally, the development of relevant feedback mechanisms was encouraged.

Step 6: Document that outcomes are associated with improved HRQOL. The final QUERI step was to link practices with improved HRQOL, functional status, and patient satisfaction. Although patient outcomes were addressed in Step 5 of the QUERI process, HRQOL measures are so important and so often neglected that they were emphasized separately in the QUERI process. Separating HRQOL in Step 6 ensured that QUERI projects emphasize this critical outcome and that adequate attention be given to its measurement and improvement.

Progress and Results

Several of the QUERI centers have already demonstrated improved patient outcomes. For example, the chronic health failure QUERI implemented a multifaceted intervention to improve the patient's outcomes and to reduce the length of stay and readmission rates, by using coordinated case management, patient education, and related tools. They have shown a significant decrease in 14-day readmission rates (from 14.2% to 4.8%) and increased patient stability on discharge and at the first outpatient visit.

The diabetes QUERI designed interventions to increase clinician awareness of diabetic-patient risk factors and to increase use of aggressive appropriate therapy. Impacts include increased provider awareness of the importance of blood pressure control and significant improvements in controlled blood pressure, lipids, and glycosylated hemoglobin (HA1c). This has led to decreasing cardiovascular events and death.

The spinal cord injury QUERI has targeted influenza vaccination of its patients. This led to a VHA-wide policy to identify and target spinal cord injury patients as a high-risk, high-priority group for flu vaccination. As a result of the policy, vaccination rates improved from 26% in the late 1990s to 74% for influenza and 89% for pneumonia in 2007.

The mental health QUERI has facilitated the spread of collaborative care for depression in VA primary-care settings.

The ischemic heart disease QUERI has implemented computerized decision support for treatment of hypertension.

In addition to the accomplishments of each QUERI center, the leadership of QUERI recognized the need to advance the field of implementation by promoting the sharing of insights and results among scientific peers. To accomplish this, it recently participated in the establishment of an online reviewed journal focused on implementation science.

John G. Demakis

See also Clinical Practice Guidelines; Evidence-Based Medicine (EBM); Health Services Research at the Veterans Health Administration (VHA); Quality of Healthcare; Quality of Life, Health-Related; Satisfaction Surveys; Structure-Process-Outcome Quality Measures; U.S. Department of Veterans Affairs (VA)

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Web Sites

Implementation Science:

<http://www.implementationscience.com>

Quality Enhancement Research Initiative (QUERI):

<http://www.hsrd.research.va.gov/queri>

U.S. Department of Veterans Affairs (VA):

<http://www.va.gov>

QUALITY IMPROVEMENT ORGANIZATIONS (QIOs)

Quality Improvement Organizations (QIOs) are nonprofit organizations whose statutory missions are to improve and protect the quality of Medicare services while safeguarding the integrity of the Medicare Trust Fund. QIOs accomplish their mandates by working with physicians, hospitals, and other healthcare providers to ensure that Medicare beneficiaries receive care consistent with professionally recognized standards of practice, mediating complaints about quality of care, and performing utilization review to ensure that services are medically necessary and appropriate. QIOs stem from a federally mandated program aimed at improving quality through national oversight and the monitoring of Medicare services. These organizations are relevant to health services research because they investigate why costs of care are increasing and how they can be contained without jeopardizing quality.

Background

The concept of QIOs emerged soon after the passage of the Medicare program (Title XVIII of the Social Security Act) in 1965, at a time when national priorities were directed on efforts to contain rising healthcare costs. Prior to that time, hospital and medical peer groups had set the precedent in establishing quality assessment criteria and in the creation of a hospital-accrediting organization (today, the Joint Commission) to enforce quality standards. These efforts not only laid the groundwork for the standards for hospitals participating in the Medicare program, they also propelled the U.S. Congress to authorize a pilot program in 1971 for an experimental medical care

review organization (EMCRO) to assess and monitor utilization of inpatient and ambulatory services, which served as the initial model for a national quality review program. A year later, the professional standards review organizations (PSROs) were established as the first national quality assurance program to focus on utilization review of hospitals and physician outliers as a way to control costs. Physician groups, however, opposed the PSROs, because they were unable to demonstrate that results from such approaches affected cost containment. A decade later, the passing of the federal Peer Review Improvement Act of 1982 (as part of the Tax Equity and Fiscal Responsibility Act of 1982) led Medicare to replace the PSROs with peer review organizations (PROs). The PROs refocused their efforts on monitoring utilization and outcomes for specific Diagnosis Related Group (DRG) assignment, readmissions, hospital operations, complications, and mortality rates. The success of the PROs led to expanding reviews in nursing facilities, home health agencies, hospital outpatient services, physician offices, and managed-care organizations. By the end of the 20th century, Medicare shifted away from a quality assurance focus on case review to quality improvement approaches that influenced patterns in clinical-care processes and outcomes. Hence, by 2002, the PROs were renamed quality improvement organizations (QIOs) to reflect the changing definitions of quality and national priorities toward measurement and population-based improvement effects.

Evolution and Current Status

QIOs constitute the nation's foremost infrastructure for quality improvement that is administered by the Centers for Medicare and Medicaid Services (CMS) as part of a larger program financed mainly through monies from the Medicare Trust Fund. CMS contracts with QIOs to provide services in all 50 states, the Virgin Islands, the District of Columbia, and Puerto Rico, plus several QIO support centers that operate solely as national resource clearinghouses. Moreover, CMS has developed and oversees a complex communication and information systems technology service for the QIO program comprising a standard data-processing system (SDPS) that serves as a centralized repository

of clinical data information interfacing with two clinical data abstraction centers (CDAC) and all QIOs. In addition, this service operates a centralized case review information system (CRIS) to track and report on case review activities as well as a protected intranet Web site used by the QIO community to share measurement tools and resources for the SDPS used in the national measures reporting activities.

As of 1984, QIOs have operated from a statement-of-work contract, in 3-year cycles, which has transformed over the decades in three distinctive phases. In the first phase, under the first and third statement-of-work contract cycles, the PROs emphasized the utilization and case review, which was gradually extended to other provider settings. During the second phase, under the fourth and fifth statement-of-work cycles, the PROs focused on transitioning healthcare providers into measurement-based quality improvement project activity rooted in systematic data collection methods using case review to validate measurements. The second phase continued under the sixth and seventh statement of work, with the PROs transitioning into the QIOs, with quality improvement projects aimed at high-cost, high-volume medical conditions (e.g., cardiac care, pneumonia, diabetes), technical assistance to providers in building performance measurement systems, and focusing cost containment on reducing the number of payment errors in hospital settings. The third phase, under the eighth statement-of-work cycle, shifted the QIOs' role to building capacity in performance-based measurement and reporting systems, adapting health information technology, redesigning processes of care, and transforming organizational culture across all provider settings.

Future Implications

The U.S. Congress completes an independent evaluation of the QIOs' program prior to the end of each 3-year statement-of-work contract cycle to determine its effectiveness in meeting quality goals and to define future directions. Current trends indicate that under the ninth statement-of-work contract cycle, slated to begin in 2009, emphasis will remain on supporting the expansion of national systems for quality measurement and

reporting to sustain performance improvement activity and on supporting emerging changes in payment systems aimed at pay-for-performance of healthcare.

Iris Garcia-Caban

See also Centers for Medicare and Medicaid Services (CMS); Joint Commission; Medical Errors; Medicare; Outcomes Movement; Patient Safety; Pay-for-Performance; Quality of Healthcare

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Web Sites

- American Health Quality Association (AHQA):
<http://www.ahqa.org>
- Centers for Medicare and Medicaid Services (CMS):
<http://www.cms.hhs.gov>
- Medicare Quality Improvement Community:
<http://www.qualitynet.org>

QUALITY INDICATORS

Healthcare quality indicators are tools to measure and monitor the quality of care. Quality indicators

are used to determine how well a healthcare system is performing and how it can be further improved. Because poor healthcare quality can adversely affect people's lives and lead to unnecessary healthcare expenditures, quality measurement is important.

Definition

Healthcare quality indicators are the instruments and methods for quantitatively assessing clinical processes and/or patient outcomes. They are used to document the quality of care delivered by providers, evaluate patient outcomes and institutional performance, make comparisons over time and between providers, inform and help purchasers and patients make wise decisions in selecting providers, support accountability and quality improvement efforts, and create transparency in the healthcare system.

Based on the published literature, some of the key characteristics of healthcare quality indicators are as follows: They are based on agreed definitions, described exhaustively, are highly specific and sensitive, are valid and reliable, discriminate well, are relevant, permit useful comparisons, and are evidence based. Quality indicators should be explicit statements of structure, process, or outcome dimensions.

Quality indicators should be developed in the planning and development phase. The planning phase should consist of choosing the clinical area for evaluation and organizing the measurement team. The development phase should comprise providing an overview of existing evidence and practice, selecting clinical indicators and standards, designing the measure specification, and performing pilot tests. The development of quality indicators should be closely tied to both the definition and efforts to improve the quality of care.

Quality indicators can be categorized based on the type of healthcare provided (preventive, chronic, or acute); function (screening, diagnosis, treatment, or follow-up); modality (history, physical examination, laboratory/radiological study, medication); whether they are generic or disease specific, and whether they are rate based or sentinel.

Overview

Recent reports have highlighted the major deficiencies in the U.S. healthcare system. The National Academy of Sciences, Institute of Medicine's 2000 report, *To Err Is Human*, estimated that between 48,000 and 98,000 people die each year in American hospitals from preventable medical errors. And another study (Barbara Starfield's) estimated that 225,000 deaths occur each year in the nation as the result of iatrogenic causes—unnecessary surgeries, medication errors, other hospital errors, hospital-acquired infections, and adverse effects of medications.

Studies have also shown that healthcare quality in the United States varies greatly among providers and across geographic regions. Healthcare often does not meet professional standards, with most adults in the nation only receiving about half of the recommended care for common acute and chronic conditions as well as preventive services. Additionally, studies have shown that the quality of care varies according to where an individual lives in the country. As a result, there remains significant room for quality improvement across all states.

Variation in healthcare quality is not unique to the United States. Many national and international studies on the quality of care have found that the care provided in most countries is substandard. Furthermore, many countries lack performance evaluation systems to measure the quality of care. Extensive research demonstrates that quality of care does not depend on the payment system. Even countries with single-payer systems have problems with quality. Additionally, the level of quality does not appear to depend on the level of healthcare expenditures. For example, the United States has the highest healthcare expenditures per capita, but it still does not have the best measurable outcomes. Overall, there remains a general lack of investment in measuring the quality of care.

The growing concern that healthcare provides poor value relative to the amount of resources spent have led many industrialized countries to develop and implement quality indicators to better manage health production and increase the quality of care. As a result, numerous quality improvement initiatives have been implemented in the healthcare system of

nations, since Florence Nightingale first measured infection rates at the Crimean barracks hospital in the 1860s.

Early efforts in the development of quality indicators were focused on disease-specific criteria for process-based evaluations of individual physicians. With the development of clinical practice guidelines and pay-for-performance initiatives, the focus of quality indicators has been expanded to cover organizational performance.

International Quality Indicators

The development of quality indicators by the United States has resulted in the international community adopting similar practices to address the low levels of healthcare quality. Following the lead of the U.S. Agency for Healthcare Research and Quality (AHRQ), a number of other organizations are developing healthcare quality indicators, including the World Health Organization (WHO), the Canadian Association for Health Services and Policy Research (CAHSPR), and the Organization for Economic Cooperation and Development (OECD). Through these efforts, many quality indicators have been developed and are being increasingly used to evaluate the performance of individual practitioners, hospitals, and other institutional providers. Consequently, a number of countries, including Canada, England, the Netherlands, and Denmark, have launched quality indicator programs.

In particular, the OECD countries have advanced the development of quality indicators and extended these methodologies. The OECD's Health Care Quality Indicators (HCQI) project developed a conceptual framework and a set of indicators to allow for the comparison of healthcare quality across its member countries. The HCQI integrates proven concepts and methods into a health performance framework.

The OECD's framework of health determinants consists of a comprehensive multistage hierarchical model that includes four major components: health, nonhealthcare determinants of health, healthcare system performance, and health system design and context. The OECD's healthcare quality indicators focus on the healthcare system's performance, which consists of healthcare needs and specific dimensions of healthcare performance.

Healthcare needs consist of staying healthy, getting better, living with illness or disability, and coping with end-of-life problems. The dimensions of healthcare performance consist of quality (effectiveness, safety, and responsiveness/patient centeredness), access, and costs.

The Dutch healthcare system's performance evaluation is an example of a quality indicators framework that has been implemented at the national level. The Dutch model, which is based on the Canadian Lalonde model, has the dual goals of constructing a conceptual framework for national healthcare performance and selecting quality indicators for measurement. The performance system combines population health and management information into the quality indicators. The system is based on a balanced scorecard, which provides information from the consumer, financial, internal business processes, and innovation perspectives.

The Commonwealth Fund in the United States also recently developed a scorecard method and applied it to healthcare quality indicators to allow for state, national, and international comparisons. These quality indicators consist of 37 indicators of performance. This initiative is the first comprehensive means of measuring and monitoring health outcomes, quality, access, efficiency, and equity of care.

Limitations

Many of the quality indicators currently in use have conceptual and measurement issues, as they do not provide a complete assessment of a provider's performance. Furthermore, the use of quality indicators in the practice setting requires a sophisticated infrastructure that generally includes information technology, which is lacking in many clinical environments. Some of the shortcomings of quality indicators and quality-monitoring initiatives are as follows: Many healthcare systems do not have adequate documentation of the quality of care for many diseases; there are no appropriate benchmarks; there is limited evaluation of quality management efforts; and there is a lack of outcomes assessment. As a result, quality indicators have had limited success in comparing the performance between providers and organizations.

Future Implications

In the future, the quality indicators will increasingly be developed and used to monitor the performance of healthcare systems at the regional, national, and international levels. However, many conceptual and methodological issues need to be addressed. Issues such as the differences in cultural context, healthcare delivery systems, data specifications, and data availability make comparisons of healthcare performance among organizations and countries challenging. These differences must be considered if an acceptable model is to be developed. It is hoped that as healthcare quality indicators continue to be developed, evolve, and be refined to better measure, monitor, and compare against universal standards of care, the quality chasm will be crossed.

Sang-O Rhee

See also Agency for Healthcare Research and Quality (AHRQ); Codman, Ernest Amory; Donabedian, Avedis; Joint Commission; Medical Errors; Nightingale, Florence; Quality of Healthcare; Structure-Process-Outcome Quality Measures

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- Agency for Healthcare Research and Quality (AHRQ): <http://www.ahrq.gov>
- Canadian Association for Health Services and Policy Research (CAHSPR): <http://www.cahspr.ca>
- Commonwealth Fund: <http://www.commonwealthfund.org>
- Joint Commission: <http://www.jointcommission.org>
- National Quality Forum (NQF): <http://www.qualityforum.org>
- National Quality Measures Clearinghouse: <http://www.qualitymeasures.ahrq.gov>
- Organization for Economic Cooperation and Development (OECD): <http://www.oecd.org>
- World Health Organization (WHO): <http://www.who.int>

QUALITY MANAGEMENT

Quality management can be described as a method that is used to make sure that all the aspects pertaining to the design, development, and implementation of a service or product are handled in an efficient and effective manner. Quality management is critical to ensuring that certain standards are met when there is a high production volume. In healthcare, quality management has gained significant attention because of the number of

deaths and injuries reported due to medical errors. In 2000, the national Institute of Medicine (IOM) published a highly influential report, *To Err Is Human: Building a Safer Health System*, which highlighted the large number of medical-error-related deaths that occur each year in the nation's hospitals. Although the nation's manufacturing industry has been using for many years quality management techniques that encourage teamwork and communication, the healthcare industry has only recently adopted these practices.

Overview

There is no singular widely accepted definition of quality management as there are various forms of this concept, including total quality management (TQM), continuous quality improvement (CQI), and statistical control processes. The definition of quality is relevant only to the extent that it provides value to the customer. However, the main components of quality management include quality control, assurance, and improvement.

The concept of quality management evolved from the work of several important figures in the field, including W. Edwards Deming (1900–1993), Joseph M. Juran (1904–2008), Walter A. Shewhart (1891–1967), and Frederick Winslow Taylor (1856–1915). Taylor, the father of scientific management, was one of the first to lay the foundation for quality management through standardization and to advocate improved organizational practices. Continuing to advance the field, Shewhart, the father of statistical quality control, introduced the concept of the control chart. Shewhart developed his concepts at Bell Laboratories, later describing the principles of statistical quality control in his book *Economic Control of the Quality of Manufactured Products* (1931). Statistical quality control is the discipline that involves applying statistical methods to process-related data that identify the critical variables or root causes that result in reduced variation of processes or the elimination of problems.

Following in Shewhart's footsteps, Deming shared his knowledge of statistical methods to achieve quality control during World War II as well as his 14 points that served as a basis for quality management principles. Because of Deming's extensive knowledge, he consulted with

post-World War II Japan to help that nation improve the quality of its products. Japan would recognize Deming by establishing a prize for quality achievement in his honor. Deming popularized the Plan-Do-Check-Act (PDCA) cycle developed by Shewhart, also known as Deming's Cycle, or Shewhart's Cycle, which is a four-step process in quality control. In this cycle, the Plan step consists of determining goals and targets as well as the methods of reaching these goals, Do involves implementing the processes, Check assesses the results of the implementation, and Act entails taking appropriate action to improve the processes.

Juran is regarded as one of the eminent quality experts, and he was one of the first to deal with the broad management concept of quality. Juran introduced the cost of quality concept in *The Quality Control Handbook* (1951). He advocated structured improvement initiatives, a sense of urgency, extensive training, and strong upper-level management commitment.

Quality Management Strategies

Six Sigma is a quality management technique based on statistical process control to emphasize the continuous decrease in process variation. Developed at the Motorola Corporation in 1986, Six Sigma strives to reduce and eliminate sources of errors in the manufacturing process. This concept eventually led to the concept of TQM, which is a strategy that aims to improve quality among all organizational levels and processes. Another quality management strategy that arose in corporate environments and has been implemented in healthcare is CQI. This concept focuses on a team approach to quality improvement as opposed to having a culture of blame.

One of the difficulties with quality management is how to define and ensure quality. The consumer, or payer, ultimately decides what the attributes of quality are. Additionally, quality can be used as a differentiating factor between an organization's products or services.

Quality Management in Healthcare

Quality management in healthcare only began to flourish in the mid-1980s when the healthcare

industry moved toward a more outcomes-based approach. The Hospital Corporation of America (HCA) was one of the leaders in adopting Deming's PDCA cycle as FOCUS-PDCA. FOCUS stands for F—find a process that can be improved, O—organize to improve that process, C—clarify what is currently known, U—understand why there is variation, and S—select a process improvement strategy.

Research on quality management initiatives to improve patient safety and reduce medical errors has been undertaken by many national organizations and agencies such as the Joint Commission, American College of Surgeons, Agency for Healthcare Research and Quality (AHRQ), and Centers for Medicare and Medicaid Services (CMS). Computerized physician order entry, flagging alert systems, and various provider-patient communication tools are just some of the quality management techniques that have been implemented in healthcare systems in recent years.

Baldrige Award

There are several national awards given out to recognize quality; however, in the United States, the Baldrige award is the most prestigious. To recognize achievements in quality, the Malcolm Baldrige National Quality Award is given out annually by the U.S. National Institutes of Standards and Technology (NIST). Established by the U.S. Congress in 1987 and named after former U.S. Secretary of Commerce Malcolm Baldrige, this award program, inspired by total quality management practices, highlights businesses and healthcare, educational, and nonprofit organizations that deliver quality services. The original intended purpose of the Baldrige award was to increase quality awareness, acknowledge the quality achievements of companies, and highlight successful quality strategies. Recent winners of the Baldrige award in healthcare include Mercy Health System of Janesville, Wisconsin (2007); Sharp Healthcare of San Diego, California (2007); and North Mississippi Medical Center of Tupelo, Mississippi (2006).

Future Implications

Because of the wide recognition of the significant gaps in the U.S. healthcare system, quality

management will remain at the forefront of the healthcare agenda as a way to reduce medical errors and adverse events while improving patient safety, outcomes, and overall quality. The increasing use of technology, improved communication strategies, and performance assessment will be integral to implementing quality management practices in healthcare. Quality management initiatives will continue to play an important role in ensuring the consistent delivery of high-quality care for all.

Jared Lane K. Maeda

See also Agency for Healthcare Research and Quality (AHRQ); Institute for Healthcare Improvement (IHI); Joint Commission; National Committee for Quality Assurance (NCQA); National Quality Forum (NQF); Quality Improvement Organizations (QIOs); Quality of Healthcare; Outcomes Movement

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 National Quality Forum (NQF):
<http://www.qualityforum.org>

QUALITY OF HEALTHCARE

Quality of healthcare refers to the degree to which healthcare services for individuals and populations increase the likelihood of desired health outcomes that are consistent with current professional knowledge. To improve the quality of healthcare, many evaluation and standardization practices have been developed. This entry discusses several aspects of healthcare quality, including the history of healthcare quality evaluation, the major organizations and programs created to increase the quality of healthcare, the role of academe in the quality of healthcare, evaluation phases, and incentives for improving quality.

History

During the first quarter of the 20th century, a confluence of events served as a strong impetus to the institutionalized, systematic evaluation of hospital quality. Abraham Flexner’s report on medical education in the United States and Canada, published in 1912, called attention to the serious deficiencies in the training of American physicians. Ernest A. Codman successfully persuaded his fellow surgeons that the development of hospital standards, along with complete, accurate records

of care and outcomes and the development of clinical databases for the study of end results, was necessary for the improvement of medical care.

In 1917, the new American College of Surgeons (ACS), created in 1913, established its Hospital Standardization Program, fundamentally embodying Codman’s proposal. The ACS formulated a one-page “Minimum Standard” on the basis of which its volunteer member-surveyors began surveying hospitals that wished to obtain ACS accreditation, the badge of excellence. Early hospital surveys revealed that medical records were for the most part utterly inadequate as documentation. The entire medical community was alerted to the need for the formulation of standards for medical and surgical care and to the need for a system of medical records that would thoroughly and accurately document patient care.

Foundation Organizations and Programs

For 35 years the ACS conducted its Hospital Standardization Program, using as surveyors its own members who volunteered their services. Over the years, it became obvious that the logistical and financial burdens of a single-organization volunteer program had become too great for the ACS to support on its own. In 1952, the ACS was joined by the American College of Physicians (ACP), American Hospital Association (AHA), American Medical Association (AMA), and Canadian Medical Association (CMA) in forming the Joint Commission on Accreditation of Hospitals (JCAH). A few years later, the CMA withdrew to become a founding member of the new Canadian Council on Hospital Accreditation (CCHA).

With the passage of the federal Medicare program in 1965, the U.S. Congress conferred “deemed status” on JCAH-accredited hospitals in the nation, granting accredited hospitals automatic eligibility for Medicare reimbursement. In view of this delegation of federal authority, as it was perceived by many critics, it became imperative to develop objective standards for the evaluation of hospital performance. The JCAH responded by completely overhauling its research and standards development programs from 1967 to 1970 and publishing updated, more objective standards with which compliance could be measured.

In 1988, in recognition of its expansion to include mental health, long-term care, home-care, and ambulatory-care providers, the JCAH changed its name to the Joint Commission on Accreditation of Healthcare Organizations (JCAHO). Since then, it has expanded its reach to include non-hospital-based clinical laboratories and office surgery practices. As a result, it has recently changed its name to simply the Joint Commission.

The growth of health maintenance organizations (HMOs) during the 1980s spurred the development of managed-care organizations and large multispecialty group practices. In 1990, the National Committee for Quality Assurance (NCQA) was established. The mission of the NCQA was to develop performance standards and conduct accreditation surveys of managed-care organizations. Since 1992, NCQA has used the Healthcare Effectiveness Data and Information Set (HEDIS), a set of standards of organizational performance with a significant emphasis on the use of screening procedures in covered populations, as its principal tool in evaluating the performance of managed-care organizations. Over the years, HEDIS has been systematically updated and expanded.

The Role of Academe

Medical schools came to system-oriented quality management slowly. Their interpretation of the concept of quality focused on the efficacy of the individual physician's clinical performance and traditionally tended to ignore the physician's role as a member of a system for providing care. While, beginning in the 1960s, small groups of inquisitive scholars on the faculties of medical schools and colleges of nursing were beginning to study ways to measure and improve the quality of hospital care, very little information about their findings and recommendations appeared in course content. In 1987, in response to an informal questionnaire survey sent to the members of the Association of American Medical Colleges (AAMC), 20% of the responders replied that they did include some material on quality assessment in the curriculum. However, the most common offering cited, typical of the affirmative responses, was a 2-hour elective lecture in the 1st or 2nd year of medical school. When the survey was repeated in 1993, the results were essentially the same.

Some respondents commented that the curriculum was so crowded with mandatory courses that no room was left for the study of organizational quality management. In another study, researchers found that 54% of the study sample of medical residents indicated that their training had not included content on medical errors.

Phases in Evaluation

In the United States, hospital-wide patient-care evaluation has gone through three recognizable phases in its evolution. The first phase was implicit review. This, the traditional method, involved assessing care on the basis of process norms or criteria derived from the assessor's personal experiences, values, and professional opinions. The criteria used were not formulated or published in advance and often varied from one expert assessor to another.

Accreditation-driven evaluation by the JCAH prior to the early 1980s focused primarily on a hospital's organizational structure and its presumed ability to provide good care, without explicitly incorporating the outcomes of care in the evaluation equation. The Joint Commission's criteria were essentially structural, although during the 1970s, research and development were moving in the direction of process-oriented surveys. Evaluation criteria focused on the organizational structure; the presence of an organized medical staff; credentials of the medical staff members; the presence of adequate numbers of qualified nurses; and the presence of acceptable plant, equipment, and instruments.

Process-oriented patient-care audits represented the second phase in institutional healthcare evaluation. During the late 1970s and 1980s, quality assurance audits performed periodically by hospitals involved the application of preestablished hospital-generated process criteria. However, the audit system had some basic flaws that weakened its potential for stimulating improvements in patient-care outcomes. When a conventional audit was performed, it was easy to pounce on a few episodes of care that failed to meet the criteria, to conclude that the observed care was acceptable, or to dismiss the whole exercise with the notation "Audit completed." The obligation had been fulfilled. Those care episodes that failed to meet the

criteria had been identified. Although it served to identify performance flaws, this approach did nothing to help professionals understand the reasons for poor performance or to point the way toward improvement. The major contribution of this approach was the fact that the criteria were established in advance of the audit and an attempt was made to quantify the evaluation findings.

Meanwhile, the Joint Commission was laying the groundwork for new techniques focusing on assessing patient clinical outcomes. Improving outcomes entails improving the systems of care. In this third, or system-oriented, phase, the healthcare industry began applying the principles of continuous quality improvement (CQI) and total quality management (TQM) to its organizational behavior. One popular approach, the “Plan, Do, Check, Act” (PDCA) cycle, gained wide acceptance. Diagnosis-specific clinical measures came into use as criteria of good care and then gave rise to the use of end-results data in developing treatment benchmarks, related “best-practices” guidelines, and evidence-based medicine. Although they were being formulated by highly credentialed groups, such as teams formed by medical specialty societies, the concepts of best practices and benchmarks met with some early resistance on the part of traditionalists, who decried their use as “cookbook medicine.” Over time, benchmarking and best practices have become generally accepted as parts of the quality management armamentarium. Reminiscent of Codman’s emphasis on end results was the development, during this time, of the concept of evidence-based medicine as a guide to practice.

Access to Care and Patient Satisfaction

Along with the reduction of medical errors and the improvement in clinical outcomes, two additional components of healthcare quality are access to good care and patient satisfaction. Access to care is a process that usually is addressed through strategies such as insurance programs, nondiscrimination policies and laws, architectural and environmental modifications, adequate public transportation, and community health education programs. Achieving widespread access to good quality care depends on legislative and public financial support at the municipal, state, and federal levels.

Over the past quarter-century, patient satisfaction has come to be recognized as an important factor in the quality of care, subject to measurement and improvement. An active consulting industry has developed around the need for objective analysis of the needs, desires, and reactions of patients and their families with regard to many elements in their care, such as the quality of hospital food, pain control, staff courtesy and responsiveness, and environmental features. Patients routinely respond to lengthy, detailed survey instruments designed to elicit their reactions to each element in the hospital experience. On the basis of analytical study of the responses, hospital managements evaluate patient satisfaction levels and institute indicated changes.

Development of New Tools

It was not enough to formulate and publish standards of performance, such as benchmarks and practice guidelines. New sets of tools for quantifying assessment and behavioral change were necessary. The need for new tools was answered in large part by the introduction of statistical process control (SPC) to healthcare quality management during the 1980s and 1990s. Derived from the work of Walter Shewhart, W. Edward Deming, and Joseph Juran and long established in industry, SPC in all its manifestations has become solidly established in healthcare.

SPC involves the use of control charts to show the degree to which a group’s performance varies from a preestablished optimal or normative range. Investigators sought to differentiate between the special causes of variation, stemming from factors peculiar to the specific case under study, and the common causes of variation, related to factors inherent in the system of care itself. During the same period, the healthcare industry came to recognize that problems of quality and safety were system problems and that their resolution was an organizational responsibility.

The use of SPC in the healthcare industry received valuable support from the publication of two seminal reports by the national Institute of Medicine’s (IOM) Committee on Quality of Health Care in America. In the first report, *To Err Is Human: Building a Safer Health System*, published in 2000, the committee explored issues of patient

safety ranging from staff training to falls and medication errors. This report sparked universal support, on the part of both consumers and the healthcare community, for methods of ensuring the safety of patients from medication and treatment errors. In the second report, *Crossing the Quality Chasm: A New Health System in the 21st Century*, published in 2001, the committee set forth broad strategic plans for redesigning the nation's healthcare delivery system with an emphasis on patient safety, accountability, and evaluation based on objective evidence.

Another widely used transplant from industry is Six Sigma, a method for bringing about quantifiable improvement in group performance, again as measured against a charted normative level. The objective of following the Six Sigma process is to reduce errors to a rate of 3.4 errors per 1 million opportunities. Following the example set by the rest of the corporate world, healthcare organizations increasingly have retained consultants to teach executives and clinical personnel how to plan and run their own Six Sigma programs in order to attain excellence in organizational performance. An important feature of Six Sigma is "Poko-yoke, or "mistake-proofing," the designing of systems that make it easy for personnel to perform their tasks correctly without error. The mistake-proofing approach has a long history in Japanese industry. While Six Sigma can be superficially described as a quantitative method of reducing errors in patient care, applying it across a healthcare organization is a complex task. It requires problem detection (often through the use of process control charting); causal analysis; problem solving, including mistake proofing and the revision of procedures; and retraining personnel.

Evidence-Based Medicine and Electronic Tools

Nine decades after Codman's call for improving end results, the same theme—the need for concrete evidence to support assessment and guideline development—continues to shape the healthcare industry's efforts to improve the quality of care. In the late 20th and early 21st centuries, the concept was called evidence-based medicine. Researchers rely on this concept to guide studies and identify optimal diagnostic and therapeutic strategies for

dissemination to clinicians. Without the nearly universal use of electronic ordering and database building in hospitals, physicians' offices, and other sites of care, it would have been impossible to reach Codman's goal of documenting and analyzing the end results of medical care.

The development and expansion of electronic ordering and medical record systems in hospitals and other care centers, which began in the 1980s and continues today, is making it possible to build and maintain the patient databases needed for SPC and the Six Sigma approach. Using the clinical-pathway model based on critical-path analysis, tracing every phase of the patient's treatment from admission to discharge, quality investigators can determine whether the treatment of individuals or of groups was consistent with best practices. Database development on a national scale made it possible for the Joint Commission, the NCQA, and the federal Centers for Medicare and Medicaid Services (CMS) to publish national performance data.

Widespread media dissemination of the information derived from these programs, along with the development of readily accessible Internet reference sources, is providing consumers with improved access to healthcare information and stoking their interest in finding and supporting improved therapies. The existence of a critical mass of well-informed consumers, theoretically, will play a role in the widespread improvement of the quality of healthcare. However, the risks of spreading misinformation also arise from uncritical, often sensationalized media presentation of clinical breakthroughs (e.g., untested "miracle cures") and ongoing developments in patient care. In the long run, the spread of information facilitates competition, which historically results in improvements in the quality of the product or service.

Creating Incentives

Leapfrog Group

The revelations contained in the IOM's 2000 report, *To Err Is Human*, resonated with the large American corporations that provide healthcare benefits to their employees. The report focused on the prevalence of hospital-related preventable medical errors, leading to an estimated 44,000 to

98,000 deaths per year. The issue was one of simple economics: The evidence indicated that employers were not getting what they were paying for—good healthcare in return for their premiums. In 2000, a group of these large corporate employers founded an association that they named the Leapfrog Group. The name reflected the need to leap forward in developing strategies to correct the existing conditions.

A principal Leapfrog Group objective is to promote high-quality healthcare by providing incentives and rewards, through their health benefits plans, to providers that use computerized physician order entry systems; base hospital referrals on evidence-based medicine; require specialized training for physicians working in intensive-care units; and adopt the 30 Safe Practices, addressing processes across a range of areas, formulated by the National Quality Forum (NQF).

Pay-for-Performance

The CMS has conducted several incentive-based monitoring and evaluation programs under the umbrella title pay-for-performance, or as they are commonly known, P4P. The general objective of pay-for-performance is to try to ensure that providers of services to Medicare beneficiaries and Medicaid recipients meet certain standards of care consistent with those of the NQF, Joint Commission, NCQA, Agency for Healthcare Research and Quality (AHRQ), AMA, and other nationally recognized bodies involved in setting quality standards. Demonstrated, documented compliance with quality measures endorsed by pay-for-performance is rewarded through an incentive system. Managed-care groups, in particular, have been quick to recognize the value of the pay-for-performance approach and have begun to develop formal mechanisms to participate in it.

PEPPER, MACS, and the False Claims Act

Many clues to the quality and effectiveness of clinical care can be found by tracing a patient's billing record. Complications and misdiagnoses are often reflected in unusually long hospital inpatient stays and very early hospital inpatient readmissions. Another resource at the disposal of the CMS, in its efforts to improve quality and efficiency, is

the Program for Evaluating Payment Patterns (PEPPER). A PEPPER is an electronic data report containing hospital-specific billing data for 13 targeted Diagnosis Related Groups (DRGs) and discharges that have been identified as carrying a high risk of payment errors. Using a PEPPER and the associated database, the CMS and hospital reviewers can home in on admissions that resulted in extended hospital stays or early readmissions for the same diagnosis. This process can point to the occurrence of clinical complications and inadequacies—poor quality—in patient care and alert hospitals to the need for change.

One factor making it difficult to follow up on patients after discharge to assess the end results of hospital care has been the strong possibility that a Medicare patient who received poor care, resulting in a complication, may not return to the same provider and hospital but may go to another physician and another hospital. Thus, the patient's postdischarge history lacks continuity and is lost to quality evaluation research. This would not happen in the presence of a single national database of Medicare patients. Beginning in 2007, and expected to be operational by 2012, a new plan called the Medicare Administrative Contractor System (MACS) will be functioning. Under the MACS plan, data from Medicare Part A and Part B plans will be combined into a single database for each Medicare region, with the entries identified by patient. Thus, all the Medicare patient's care, whether office, ambulatory, or inpatient, will be traceable in one database, facilitating long-term study.

As purveyors of services to Medicare patients, healthcare providers are subject to the terms of the federal False Claims Act. Therefore, they can be prosecuted for defrauding the federal government if their services are shown to have been other than appropriate and of good quality. A growing body of case law reflects the successful prosecution of healthcare providers found guilty of such fraud. The severe financial and operational sanctions provided for in the amendments to the act can be a strong deterrent to clinical behavior that fails to meet established norms and standards.

Future Implications

The quality of healthcare will remain an important issue in the future. With the greater availability of

information and quality measurement tools, insurers and individual consumers will, it is hoped, be able to more wisely choose healthcare organizations and individual practitioners who provide high-quality care.

Jean Gayton Carroll

See also Agency for Healthcare Research and Quality (AHRQ); Clinical Practice Guidelines; Evidence-Based Medicine (EBM); Joint Commission; Leapfrog Group; National Committee for Quality Assurance (NCQA); Pay-for-Performance; Quality Management

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- Leapfrog Group: <http://www.leapfroggroup.org>
- National Committee for Quality Assurance (NCQA): <http://www.ncqa.org>
- National Quality Forum (NQF): <http://www.qualityforum.org>

QUALITY OF LIFE, HEALTH-RELATED (HRQOL)

Health-related quality of life (HRQOL) refers to an individual's or a group's physical and mental well-being over time. Healthcare providers and health services researchers use HRQOL tools to measure patients' chronic illness and to see how these conditions affect a person's daily life. Additionally, public health professionals use HRQOL to measure disorders, disabilities, and diseases in various populations. By tracking HRQOL, groups with poor physical and mental health can be properly identified. Policies to improve the health of these groups can then be appropriately developed.

Overview

The following highlights an example of the use of HRQOL for one individual. A 5-year old girl presents at a hospital with acute lymphoblastic leukemia, the most common type of childhood cancer. For the physicians, as well as the parents, the child's current quality of life is a key concern. How much pain is the child in now? What is her emotional condition? How did she respond to earlier therapies?

Examining the HRQOL in patients is of increasing concern in the medical community, and these concerns are affecting the way new therapies are administered and randomized controlled trials (RCTs) are planned. HRQOL provides important information on the improvements that new therapies offer as well as an outcome measure for economic evaluations.

Recently developed HRQOL measures and applications are important contributions to this emerging field. Information from these tools is used to adjust therapy or improve treatment for the patient. The quality-of-life information is also

used to prevent and control disease, injury, and disability in others.

According to researchers, the domains of quality of life refer to areas of behavior that are measured. The subjective domains of quality-of-life include the following: physical functioning, occupational functioning, psychological functioning, social functioning, and perceptions about health status. Some researchers have also defined “social health” as the dimension of an individual’s well-being that concerns how he or she gets along with others, how other people react to the individual, and how the person interacts with social institutions and norms.

From an objective standpoint, health status can be measured by laboratory or diagnostic tests, psychology tests, measures of socioeconomic status, and the degree of social support. Experts note that the so-called objective measures of quality of life often bear little relationship to life satisfaction. Thus, patients’ subjective satisfaction should always be considered in routine assessment and clinical interventions as it is a useful source of information.

Clinicians have for many years had to substitute physiological or laboratory tests for the direct measurement of people’s health. During the past 20 years, however, clinicians have recognized the importance of direct measurement of how people are feeling and how they are able to function in daily activities. Investigators have now developed sophisticated methods of measuring quality of life.

Healthy Day Measures

The Centers for Disease Control and Prevention (CDC) employs what it calls Healthy Day Measures to monitor the quality of life of individuals. This measure is a survey which can be administered to any population and from which data about the individual’s state of health can be determined. These questions include the following:

1. Would you say that in general your health is excellent, very good, good, fair, or poor?
2. Now thinking about your physical health, which includes physical illness and injury, for how many days during the past 30 days was your physical health not good?

3. Now thinking about your mental health, which includes depression, stress, and problems with emotions, for how many days during the past 30 days was your mental health not good?
4. During the past 30 days, for how many days did poor physical or mental health keep you from doing your usual daily activities, such as self-care, work, or recreation?

The CDC indicates that “unhealthy days” are an estimate of the overall number of days during the preceding 30 days when the respondent felt that his or her physical or mental health was “not good.” To obtain this estimate, responses to Questions 2 and 3 are combined to calculate a summary index of overall unhealthy days, with a maximum of 30 unhealthy days. For instance, a person who reports 4 “physically unhealthy days” and “2 mentally unhealthy days” is assigned a value of 6 unhealthy days, while someone who reports 30 physically unhealthy days and 30 mentally unhealthy days is assigned a maximum of 30 unhealthy days.

The CDC reports that the majority of individuals report “substantially different” numbers of physically unhealthy days versus mentally unhealthy days. For example, according to the 1998 Behavioral Risk Factor Surveillance System (BRFSS), 68% of the 68,600 adults who reported any unhealthy days indicated only physically unhealthy days or mentally unhealthy days, while 4% indicated “equal numbers” for each measure. Additionally, evidence demonstrates that the reported days do not overlap. Just 10% of the 250 persons who reported both 15 physically unhealthy days and 15 mentally unhealthy days also reported more than 15 days of recent activity limitation due to poor physical or mental health.

History

The World Health Organization (WHO) broadly defines health as a state of complete physical, mental, and social well-being and not just the absence of disease. For two decades, the four core Healthy Days Measures have been part of the CDC’s state-based BRFSS’s sample. Beginning in 2000, the Healthy Days Measures were also incorporated by CDC’s National Center for Health

Statistics (NCHS) into the examination part of its National Health and Nutrition Examination Survey (NHANES).

The measures and data have also been used for research and program planning by CDC's Cardiovascular Health and HIV/AIDS programs. Other users have included the Public Health Foundation, the Foundation for Accountability, and numerous other academic and government programs.

Recently, several organizations have found these Healthy Days Measures useful at the national level for determining health disparities, following population trends, and creating broad coalitions around a measure of population health compatible with the WHO's definition of health.

The Healthy Days Measures and data have been employed by state and local public health departments for tracking the overall progress in achieving the two major goals of the federal government's Healthy People 2010 initiative, increasing the quality and years of healthy life and eliminating health disparities.

Major National Research Findings

The CDC has reported a number of key findings related to the nation's adult HRQOL, including the following: Americans on average report that they felt "healthy and full of energy" for only about 19 days per month; they said that they felt unhealthy—physically or mentally—for about 6 days per month; nearly one third of Americans said that they suffer from some mental or emotional problems every month—including 10% who reported that their mental health was not good for 14 or more days per month; younger American adults, between 18 and 24 years of age, said that they suffered mental health distress the most; older American adults suffered the most from poor physical health and activity limitation; Alaska Natives and other Native Americans reported the highest levels of unhealthy days among American race/ethnicity groups; those Americans with the lowest income and education reported more unhealthy days than did those with higher income or education; and Americans with chronic diseases and disabilities reported high levels of unhealthy days.

The CDC also reported on HRQOL for individuals suffering from specific diseases, including chronic arthritis, breast cancer, heart disease, and diabetes mellitus. They found the following: Adults with chronic arthritis reported 4.6 more unhealthy days per month compared with adults without arthritis; among adults with arthritis, the largest number of unhealthy days was experienced by women, younger persons, and persons without a college education; women with breast cancer reported experiencing 8.5 unhealthy days per month compared with 6.1 unhealthy days per month for women without breast cancer; individuals who had a heart attack, coronary heart disease, or a stroke reported an average of 10 unhealthy days for the previous month compared with 5 unhealthy days reported among persons not having one of these conditions; and individuals with diabetes reported experiencing 9.9 unhealthy days per month compared with 5.1 unhealthy days per month for adults without diabetes.

Controversy

Researchers typically measure HRQOL by using survey questionnaires that include questions about how individuals are feeling or what they are experiencing associated with response options such as "yes" or "no" or point scales. As discussed earlier, researchers then aggregate the responses to these questions into domains or dimensions—such as physical or emotional function—that yield an overall quality-of-life score. However, controversy exists over the extent to which individual values must be included in its measurement. Increasingly, researchers are asking if it is sufficient to know that individuals with chronic obstructive lung disease in general value being able to climb stairs without getting short of breath? Or does medical science need to establish that the individual values climbing stairs with dyspnea (difficulty in breathing)?

Additional controversy exists about the value of the scoring systems developed by the CDC and other health research organizations. Researchers are wondering whether it is enough to simply know that both dyspnea and fatigue are important to people with lung disease. Or does medicine need to establish their relative importance? Furthermore, if establishing their relative importance is necessary, which of the many available approaches should be used?

An emerging consensus indicates that medicine is ready to accept an individual's own statements about what he or she values without a very precise determination of ranking of that information on a scale. However, experts note that not all treatment and therapies lead to an improvement in HRQOL for patients. Many life-prolonging treatments have a negligible impact on the quality of life that individuals experience. This may lead them and their families to be concerned with the very small gains in life span that come at a great price. Some examples of this include chemotherapy for cancer and treating HIV disease. Although life may be prolonged, the individual may worry about how his or her quality of life may be affected.

When the physician's goal for treatment is to improve how patients are feeling rather than to merely prolong their lives, HRQOL measurement is vital. Difficult decisions occur, however, when the relationship between laboratory measures and HRQOL outcomes is uncertain. In the past, physicians have relied on substitute outcomes, not because they were not interested in making patients feel better but because they assumed a strong link between physiologic measurements and the well-being of the patient.

A recent RCT of patients with symptomatic postmenopausal osteoporosis studied the effect of sodium fluoride on bone density and vertebral fractures. The researchers reasoned that increased bone mass and fewer vertebral fractures would most definitely lead to decreased pain and increased functionality. The question to be asked, however, is does the failure of the researchers to measure the effect of treatment in areas of unequivocal importance to patients, including pain, physical function, and household and leisure activities, affect the clinical message of the results? Based on research related to HRQOL, the answer would be yes.

Fear of Recurrent Disease

The relationship between physiological and clinical measures and patients' symptoms is usually somewhat modest. Each clinician must therefore rely on his or her own threshold. However, increasing consultation with the patient is becoming the norm.

Studies of cancer survivors reveal that many of them fear the recurrence of the disease. Studies show

that HRQOL measures can also be successfully used with former as well as current cancer patients.

Future Implications

As HRQOL measures continue to be developed and expand in their use, they will likely have a growing impact on improving the health of populations. HRQOL tools hold much potential in facilitating a more effective healthcare system and enhancing patient outcomes.

Gene J. Koprowski

See also Activities of Daily Living (ADL); Acute and Chronic Diseases; Cancer Care; Disability; Measurement in Health Services Research; Mental Health; Quality of Well-Being Scale; Short-Form Health Surveys (SF-36, -12, -8)

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- Centre for Health Evidence (CHE): <http://www.cche.net/usersguides/life.asp>

QUALITY OF WELL-BEING SCALE (QWB)

The Quality of Well-Being Scale (QWB) is a widely used general health index that summarizes an individual's current symptoms and disabilities in a single number. It represents a judgment of the health problems of an individual or population, and it can be expressed in terms of quality-adjusted life years (QALY). The QWB can be used as an outcome measure to estimate present and future healthcare needs, and it can be used with any type of acute or chronic disease.

Overview

The first version of the QWB was developed in the 1970s by J. W. Bush and his colleagues at the University of California at San Diego. It was later refined to its current forms in the late 1990s by Robert M. Kaplan. The QWB is a general health-related questionnaire that measures quality of life as defined by four major domains—symptoms, mobility, physical activity, and social activity. Scores from the questionnaire are often translated into an economic assessment for studies of cost-effectiveness of treatment and also to approximate an individual's QALY. The QWB exists in two formats—self-administered (QWB-SA) or given by a trained interviewer, often a healthcare provider. Each type of QWB takes about 20 minutes to complete. The QWB has been translated into Spanish, German, Chinese, and many other languages.

Scoring

In terms of finding a person's place on the scale, the QWB combines weighted values for symptoms and functioning. Functioning is evaluated by questions that gather information about limitations over the previous 3 days, within three areas—mobility, physical activity, and social activity. In addition, symptoms are evaluated by asking simple questions about how the individual feels with regard to the presence or absence of common symptom complexes (e.g., sore throat, joint pain). The scores (which are arranged in a roughly normal distribution) from these four areas are tallied

to provide a numerical evaluation of an individual's well-being at a given point in time, somewhere on the continuum between the extremes of *death* (0.00) to *complete health* (1.00). In addition to using morbidity descriptors, the QWB also uses mortality data from life tables, clinical experience, and direct measurement to help determine quality-adjusted life expectancy (current life expectancy corrected for decreased quality of life associated with disabilities and disease states).

Validity and Reliability

Many research studies have shown the QWB to be very reliable (consistency of measurement) in the short term, especially when it is given on back-to-back days, with a 96% reliability rate in the general adult population and ranging from 83% reliability in burn patients to 98% reliability in chronic obstructive pulmonary disease (COPD) patients, when considering the population with morbidities. Many studies have also shown the QWB to be highly valid (correctness of measurement) in repeated randomized controlled trials (RCTs). One study, for example, found that individuals with Alzheimer's disease scored significantly lower on the QWB, while the degree of cognitive impairment was also found to be related in a systematic way, leading to lower QWB scores. Another study found that the QWB scores were highly correlated with performance and physiological findings relevant to the health status of those with COPD. At the same time, the QWB was capable of being translated into well-year units for studies of cost-effectiveness and also served as an outcome predictor and measure for the disease.

Criticisms

Criticisms of the QWB include the fact that there is no mental health component, which some would argue makes evaluating psychiatric patients very difficult (although Kaplan disagrees with this notion). Another difficulty with the QWB is assessing the potential impact of the interviewer on the responses of the individual. The QWB has also been criticized as being long, complex, expensive, and difficult to administer. To some extent the self-administered

QWB alleviates many of these problems. It has been shown that the self-administered version of the QWB is highly correlated with the interviewer-administered QWB and that it retains the same validity and reliability.

Future Implications

The QWB has been used in numerous RCTs and research studies to evaluate medical and surgical treatments for conditions such as arthritis, atrial fibrillation, COPD, cystic fibrosis, diabetes mellitus, and lung transplantation. In addition, the QWB was used to prioritize medical procedures and ration health resources by Oregon's Medicaid program in the late 1980s and early 1990s. The innovative, and highly controversial, Oregon Plan attempted to extend Medicaid cost-effective health services such as prenatal care but eliminated costly, ineffective services such as organ transplants. After the deaths of several individuals who required transplants, the plan was suspended. With the increase in the nation's aging population and growing concerns over the cost-effectiveness of healthcare, it seems likely that quality-of-life measures such as the QWB will be more widely used by healthcare organizations, practitioners, and researchers to measure various treatments and allocate resources.

Sumul Gandhi

See also Cost-Benefit and Cost-Effectiveness Analyses; Health; Quality-Adjusted Life Years (QALYs); Quality Indicators; Quality of Healthcare; Quality of Life, Health-Related; Short-Form Health Surveys (SF-36, -12, -8)

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R

RAND CORPORATION

The RAND Corporation is the largest policy analysis think tank in the United States. The RAND (a contraction of “research and development”) Corporation is an independent, nonprofit institution that conducts research and analysis for the U.S. and foreign governments, international organizations, industry, foundations, universities, professional associations, and other organizations. Headquartered in Santa Monica, California, with branch offices in Washington, D.C., and Pittsburgh, Pennsylvania, the RAND Corporation employs about 1,600 people. It annually receives over \$200 million in contracts and grants, and at any given time its staff is working on about 500 projects. Of its nine research divisions, the RAND Health division consists of over 170 employees. Each year, it produces many reports concerning various aspects of health services research.

Background

During the various military campaigns of World War II, the U.S. War Department, the Office of Scientific Research and Development, and industry identified the need for a private organization to link military planning with research and development. To establish such an organization, the U.S. Army Air Forces (USAAF) in the fall of 1945 issued a special contract to the Douglas Aircraft

Company in Santa Monica, California, to create Project RAND, which would eventually become the RAND Corporation.

A number of people participated in the creation of Project RAND, including H. H. “Hap” Arnold, U.S. Secretary of War and Commanding General of the USAAF; Edward Bowles, a professor of electrical engineering at the Massachusetts Institute of Technology (MIT) and a consultant to the Secretary of War; General Lauris Norstad, Assistant Chief of Air Staff for Plans, USAAF; Major General Curtis LeMay of the USAAF, who was in charge of the strategic bombing of Japan; Donald Douglas, President of Douglas Aircraft Company; Arthur Raymond, Chief Engineer at Douglas; and Franklin Collbohm, Raymond’s assistant.

The first report of Project RAND, which was published in 1946, was years ahead of its time. It addressed the design and possible use of an experimental, world-circling spaceship.

In 1948, with the approval of the U.S. Air Force (which was established in 1947), RAND became an independent, nonprofit corporation. And Project RAND was transferred to the new corporation. During much of the Cold War era, the RAND Corporation worked closely with the defense industry, the military, and the federal government, helping to develop policies and strategies and to improve decision making. In the 1960s, RAND expanded its scope to also include national, social, economic, political, and healthcare delivery and financing issues.

Organizational Structure

The RAND Corporation's mission is to help improve policy and decision making through research and analysis. Its core values are quality and objectivity. To accomplish its mission, RAND is governed by a 23-member Board of Trustees, which is composed of leaders from the business, academic, and nonprofit sectors. The corporation is also guided by 16 advisory boards, composed of experts in various areas. It has nine research divisions, including the following: RAND Army Resource Division; RAND Education; RANDEurope; RANDHealth; RANDInfrastructure, Safety, and Environment; RAND Institute for Civil Justice; RAND Labor and Population; RAND National Security Research Division; and the RAND Project AIR FORCE.

RAND Health Division

Originating in the 1960s, the RAND Health division currently consists of three programs: Economics, Finance, and Organization; Quality Assessment and Quality Improvement; and Health Promotion and Disease Prevention. The division also includes four strategic initiatives: Compare; Global Health; Public Health Preparedness; and Military Health. The division's research agenda is very broad, including areas such as aging and health; complementary and alternative medicine; diversity and health; end-of-life care; global health; health economics; health security; HIV, sexually transmitted diseases, and sexual behavior; informatics and technology; maternal, child, and adolescent health; mental health; military health; neighborhood influences on health; overweight and obesity; public health; quality of care; substance abuse: alcohol, drugs, and tobacco; and violence and health.

Past and Present Healthcare Research

Over the decades, the RAND Corporation has conducted a number of innovative and influential health services research studies. For example, in the early 1970s to the mid-1980s, it conducted the RAND Health Insurance Experiment (HIE). The HIE was one of the largest and most important social experiments in U.S. history. It randomly assigned several thousand families in various regions of the nation to insurance plans with various levels

of cost-sharing arrangements and then followed them for up to 5 years to evaluate the effects on healthcare expenditures and health status. The study helped shape health services research in the nation and greatly influences policies for healthcare financing.

In the late 1980s and early 1990s, RAND conducted the Medical Outcome Study (MOS), the first large-scale study attempting to measure medical outcomes in terms of how individuals feel, function, and perform. As part of the study, a brief, health-screening survey instrument was developed: the Short Form 36-Item Health Survey, or SF-36. Today, the SF-36 and other versions of it are widely used throughout the world.

In late 1990, RAND conducted the HIV Cost and Services Utilization Study (HCSUS), the first comprehensive national survey on healthcare use of persons in care for HIV. The study provided information on the barriers to access, the costs of HIV care, and the effects of HIV on quality of life.

In the 2005, RAND released the first comprehensive study of the costs and quality effects of computerizing clinical records. The study found that computerizing records dramatically increased efficiency, greatly increased safety, and led to various health benefits.

Currently, the RAND Health division is conducting research in health economics, public health, and quality of care. For example, in 2007, its researchers provided technical assistance to the U.S. Department of Health and Human Services (HHS) on how to improve the readiness of state and local health departments to respond to emergencies. They conducted research to determine what percentage of children in the United States are receiving recommended care for acute and chronic medical problems. And they helped global health officials address the threat of an influenza pandemic in Southeast Asia.

Frederick S. Pardee RAND Graduate School

The RAND Corporation established a graduate school in public policy analysis in 1970. The school, originally the RAND Graduate Institute, changed its name to the RAND Graduate School in 1987, and in 2004, its name was again changed to honor Frederick S. Pardee, a former RAND researcher and philanthropist. The graduate school,

which is part of RAND and an autonomous entity within it, primarily awards the Doctor of Philosophy (PhD) degree. It also awards a Master of Philosophy (MPhil) degree. About 25 new students are accepted each year, and currently there are about 100 students enrolled in the school. Doctoral students (called fellows) are required to take course work and qualifying examinations and to write a dissertation. They also are required to take a practicum by working on various RAND projects. To date, the school has awarded about 200 doctoral degrees, making it the world's leading producer of doctorates in public policy analysis. Graduates from the school are employed in research and public service, as well as in the private sector.

Ross M. Mullner and Cherie Weinewuth

See also Brook, Robert H.; Health Economics; Newhouse, Joseph P.; Public Policy; RAND Health Insurance Experiment; Short-Form Health Surveys (SF-36, -12, -8); Ware, John E.

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Frederick S. Pardee RAND Graduate School:
<http://www.prgs.edu>
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 RAND Health: <http://rand.org/health>

experiments in U.S. history. The HIE randomly assigned several thousand families in various geographic areas of the nation to insurance plans with various levels of copayments and then followed up for 5 years to evaluate the effects on healthcare expenditures and health status. The experiment ran from approximately 1974 to 1982. At the time, there was limited information on the impact of cost sharing or of prepaid care on health expenditures, and there was almost no information on the impact of health insurance on health status. The experiment's results encouraged the restructuring of the nation's private health insurance, and they are still widely cited today.

Background

To assess the potential economic and health impacts of decisions on what insurance coverage to provide, how generous the cost sharing should be, and how services should be delivered (traditional fee-for-service-based insurance plans versus prepaid, health maintenance organization [HMO]-style managed care), there are two research strategies. The first is to collect more and better observational data, including information on insurance structure, health status, and other confounders that could lead to biased assessment of the effect of health insurance on either expenditures or subsequent health status. The second is to design and conduct a randomized trial that would experimentally assign coverage to remove the potential bias from residual confounding or to avoid adverse selection effects. Both strategies were followed from the 1970s through the end of the century. Major observational data sets were collected under the auspices of the National Center for Health Services Research (NCHSR), the Agency for Health Care Policy and Research (AHCPR), the Agency for Healthcare Research and Quality (AHRQ), and the National Center for Health Statistics (NCHS). The RAND Corporation designed and conducted the randomized trial known as the HIE with financial support from the Office of the Assistant Secretary for Planning and Evaluation (ASPE). The health economist Joseph Newhouse was the principal investigator for the project throughout its length.

RAND HEALTH INSURANCE EXPERIMENT

The RAND Health Insurance Experiment (HIE) was one of the largest and most important social

Study Design and Sample

The HIE enrolled families in six sites—Dayton, Ohio; Seattle, Washington; Fitchburg, Massachusetts; Franklin County, Massachusetts; Charleston, South Carolina; and Georgetown County, South Carolina—starting in 1974. The last of the enrollees exited the study in 1982. The sites were selected to represent the four geographic census regions, to represent the range of city sizes to reflect the complexity of the medical delivery system, to cover a range of waiting times to appointment and physician per capita ratios (in order to test for the sensitivity of demand to non-price rationing), and to include both urban and rural sites in the North and the South.

Health Insurance Plans

Families participating in the experiment were randomly assigned to 1 of 14 different fee-for-service or 2 prepaid group practice health insurance plans. The fee-for-service plans had different levels of cost sharing that varied over two dimensions: the coinsurance rate and an upper limit on out-of-pocket expenses. The coinsurance rates (percentage paid out of pocket) were 0%, 25%, 50%, or 95% for all health services. Each plan had a stop-loss or upper limit on out-of-pocket expenses of 5%, 10%, or 15% of family income up to a maximum of \$1,000. Beyond the maximum out-of-pocket dollar expenditure amounts, the insurance plan reimbursed all expenses in full. One plan had different coinsurance rates for inpatients and ambulatory medical services (25%) than for dental and ambulatory mental health services (50%). Finally, on one plan, the families faced a 95% coinsurance rate for outpatient services, subject to a \$150 annual limit on out-of-pocket expenses per person (\$450 per family). In this plan, all inpatient services were free; in effect, this plan had an outpatient individual deductible. The coinsurance rate for this plan was changed to 95% after the 1st year of the study in the first site (Dayton, Ohio).

To illustrate how one of the plans worked, we consider a plan with a family coinsurance rate of 25% up to a stop-loss of \$1,000 in 1970s dollars (or \$3,400 in 2007 dollars, corrected by the all-item consumer price index). For the first \$4,000 of

expenditures on any health service (dental, medical, or mental health), the family pays 25% of the bill, and the insurance company pays 75%. Beyond that point (the stop-loss), the family pays nothing more out of pocket for the remainder of that year. The following year, the family again will incur out-of-pocket expenses of 25% of the bill until it reaches its stop-loss or upper limit on out-of-pocket expenses.

In addition to the fee-for-service-based health insurance plans, the HIE had two groups enrolled in a prepaid staff model HMO, Group Health Cooperative of Puget Sound (GHC). The scope of benefits was comparable with that of all the fee-for-service plans. Like the free plan, there was no out-of-pocket cost as long as enrolled individuals stayed within the plan.

All plans covered the same wide variety of services, including inpatient and outpatient medical care, mental healthcare, dental services, drugs and supplies. However, there were some benefit exclusions: nonpreventive orthodontia, cosmetic surgery, and outpatient psychotherapy services in excess of 52 visits per year per person.

The families were enrolled on their experimental health insurance plans as a group, subject to the same coinsurance rate(s) and stop-loss, with the exception of the Individual Deductible Plan with its separate individual deductible for outpatient care. Only individuals eligible for the experiment could participate. Families were either offered one experimental plan or were allowed to continue with their existing coverage. To prevent refusals, families were given a lump-sum payment greater than the worst-case outcome in their experimental plans relative to their previous plan; thus, families were always better off financially for accepting the enrollment offer. Moreover, because of a bonus for completion, they were always better off completing the study. Hence, there is a theoretical presumption of no bias from refusal or attrition. In fact, study researchers have detected negligible effects from refusal and attrition.

Families were assigned to treatments using the finite selection model. This model is designed to achieve as much balance across plans as possible while retaining randomization; that is, it reduces the correlation of the experimental treatment with health, demographic, and economic covariates.

Refusal and Attrition

There are two potential threats to the balance of health and other characteristics across insurance plans: (1) nonrandom refusal of the offer to participate and (2) nonrandom attrition from the study. Refusals of the plan offer varied across plans. However, analysis of these refusals to participate indicates that the only significant difference between those who accepted and those who rejected the offer was that the latter had lower education and income. Income is controlled for in the analysis of experimental data, and education had no detectable (partial) effect on use. There is no evidence that those who rejected the offer to participate were sicker or that there was an interaction between plan, sickness, and refusal of the offer.

Individuals on the cost-sharing plans were more likely to leave the study early than were individuals on the free plan. These early departures were also sicker on average than those who stayed. Thus, people on the cost-sharing plans at the end of the study were healthier on average than those on the free plan. This could lead to an overestimate of the response to the cost-sharing insurance plans. To correct for such a potential bias, baseline health status measures were included as covariates.

Population Sampled

The individuals enrolled in the experiment were drawn from a random sample of each site's noninstitutionalized civilian population, excluding those 62 years of age and older at the time of enrollment, those with incomes in excess of \$25,000 in 1973 (or \$115,000 in 2007 dollars—this excluded 3% of the families contacted), those eligible for the Medicare disability program, and veterans with service-connected disabilities. The HIE also included a group in GHC. A group of nonelderly individuals already enrolled in GHC were randomly selected and invited to participate as a control group. Another group of nonelderly, noninstitutionalized civilians in the fee-for-service system were randomized to be an experimental group at GHC from the same pool as those enrolled in the fee-for-service plans.

Estimation Samples

Estimation samples varied from the study groups being examined—the whole population, adults,

children, fee-for-service plans, or comparisons between fee-for-service and prepaid group plans (in Seattle only). Interim results were reported in the first two fifths of the data and final results on the full sample of those enrolled for the 3- to 5-year duration.

Outcomes (Dependent) Variables

The analysis of the economic effects of cost sharing focused on medical care utilization (inpatient hospital stays, outpatient visits, episodes of treatment) and related healthcare expenditures (including drugs and supplies), based on information collected on health insurance claims. All expenditures, including out-of-pocket payments and payments by the insurance carrier, were relevant. For the prepaid plans, medical records were abstracted in the form of claims data and assigned prevailing fee-for-service prices; these were augmented with information on out-of-plan use.

The effects of cost sharing focused on a number of health status measures developed as a part of the HIE. These included scales based on self-reported health status in a number of health domains (general health, mental and social health, physical and role limitations, pain, etc.), the presence and severity of health conditions, as well as assessments based on physical examinations that were given to a random percentage of families at enrollment and to all families at normal completion. Nearly 77% of all noncompletion cases (85% of the survivors) were located and had their health assessed.

Independent Variables

Most analyses of the HIE report simple averages by health insurance plan or by groups of plans. However, any analysis must rely on results that already control for demographic, health status, and socioeconomic measures in addition to fixed effects for study sites and the health insurance plan.

Unit of Analysis

The unit of analysis is a person-year for the analysis of utilization and expenditures, because the stop-loss is an annual limit. The researchers used the person as the unit of observation because

the major determinants of the use of services are individual (e.g., age, gender, and health status) rather than family (e.g., insurance coverage and family income).

The unit of analysis for the health status studies is the person, again because the major determinants of health are individual. Children (under age 13) were separated from adults because the instrumentation of health status was different.

Results

Healthcare Utilization and Expenditures

The results from the HIE indicate that increases in out-of-pocket cost sharing reduced healthcare use and costs. Since all these plans had a stop-loss on the financial risk incurred by the family, this is the effect of first-dollar cost sharing, not the effect of a change in out-of-pocket price throughout the year. Thus, each response is a response to price for part of the year and having free care (beyond the stop-loss or deductible) for the remainder of the year. Specifically, higher coinsurance rates reduce expenditures by about 20% for moderate levels of cost sharing and nearly 30% for high levels of cost sharing. This response corresponds to a price elasticity of approximately -0.2 once the effect of the stop-loss has been eliminated. Though less dramatic, the same response is observed for the probability of any care and for any admission during the year. Most of the response to cost sharing can be traced to the reduction in the likelihood of having any healthcare during the year.

Although children and adults exhibited similar responses to insurance plans for outpatient care, they had different responses to cost sharing for inpatient hospital care. There was little response for children but a significant response for adults. The experiment did not detect any differential response to cost sharing by income group, gender, health status, or site.

Other healthcare goods and services exhibited different or more complicated responses. The expenditures for outpatient prescriptions followed the same pattern as that for outpatient care. The response of emergency department use to cost sharing was very similar to that for general medical care, but this masked a major difference in response depending on the urgency of the diagnosis. Urgent

emergency department demand had half the response to cost sharing that less urgent care did. Dental-care demand surged on the free plan by 46% during the 1st year of the experiment. After that, plans with out-of-pocket cost sharing were about a quarter less expensive than the free plan. Outpatient mental healthcare was almost twice as responsive to cost sharing as outpatient care.

In an attempt to understand whether cost sharing had a greater effect on the appropriateness of care, the study examined the appropriateness of inpatient care for conditions other than maternity, pediatric, or psychiatric, using a methodology that indicated whether the care had to be done in a hospital or could have been done as an outpatient service. The free and cost-sharing plans had very similar and statistically insignificantly different fractions of hospitalizations that were inappropriate. Thus it appears that cost sharing is a blunt instrument for reducing inappropriate care because it reduced both appropriate and inappropriate care by approximately the same amount.

The HMO experimental group had 28% lower annual expenditures than the free fee-for-service plan. Both had the same benefits and the same out-of-pocket costs. This lower expenditure rate was achieved largely by a 39% lower admission rate at the HMO. Outpatient visit rates were comparable for both the HMO experimental group and the free fee-for-service plans. Other fee-for-service plans also had higher expenditure rates than the HMO, except for the 95% plan, which acts like a large deductible plan. That plan had significantly lower visit rates and insignificantly higher admission rates than the HMO experimental group. The individual deductible plans followed a similar pattern.

One of the concerns motivating this experiment group was that HMOs were experiencing favorable selection that would help explain the difference in utilization and costs. The experimental comparisons suggest that such an explanation did not account for the differences observed in this mature HMO. A further comparison of those HMO enrollees who self-selected into the HMO versus those who were randomized in indicates only modest differences. If anything, the controls were slightly older and sicker than the experimental group, which partially accounts for the difference in visit rates.

Health Status

Despite the substantial reduction in healthcare utilization and expenditures, there was little evidence that cost sharing had an adverse effect on the overall health status of the HIE's enrollees. There was no statistically significant effect on average for adults on general health or separately for physical, mental, or social health or on an index of the risk of dying. Nor was there an effect on the economically poorest part of the adult population. However, there was some evidence that those individuals who were both poor and sick at the beginning of the experiment had better health status at the end of the experiment if they were on the free plan rather than on the cost-sharing plans. This group constituted about 6% of the HIE population.

There were some areas of health that were better with the free plan than with cost sharing. These included hypertension control and vision; there was also a reduction in the number of decayed teeth among young adults.

There was no statistically significant effect of cost sharing on children's health status relative to the free plan. Nor was there evidence of an effect for at-risk or poor children.

For both children and adults, there was no evidence of an overall effect of the prepaid, staff model HMO compared with the free fee-for-service plan.

Policy Implications

The HIE found that health insurance plans with first-dollar cost sharing and moderate deductibles could have a major impact on total healthcare utilization and healthcare costs without having an adverse effect on the health status of nonelderly individuals. Although there were healthcare reductions, the cost sharing appeared to be a blunt policy instrument in that it reduced both medically appropriate and medically inappropriate hospitalization nearly equally. However, it is important to recognize that the word *inappropriate* has a more limited use in this and other studies of the period. Here, an inappropriate hospital stay means that the treatment could have been given in an outpatient setting, while an inappropriate inpatient stay means that the stay was inappropriate

or that the patient had unnecessary days at either the beginning or the end of the stay.

If cost sharing reduced both inpatient and outpatient care, why were the changes in health status so modest—largely limited to blood pressure control, corrected vision, and decreases in dental decay? Why weren't there more substantial changes in overall health status or mortality? Several explanations have been offered: The nonelderly population as a whole is healthy relative to the elderly or the disabled, and thus there is less room for improvement; the similar effect on appropriate versus inappropriate care may mean that there are offsetting effects of cost sharing; the data are from the 1970s and early 1980s, before the major drops in inpatient utilization in the nation, and thus there may have been more discretionary care in the healthcare system than has been the case in the past decade; and the presence of a stop-loss on the plans means that cost sharing was never large enough to deter any major or important utilization (none of the health plans involved unlimited cost sharing or left the family completely uninsured). Finally, it is worth remembering that one of the major benefits of health insurance is to protect risk-averse individuals against the uncertainty involved with large healthcare bills, especially ones that may be sufficiently large to impoverish the individuals. All these explanations are plausible to some degree. A single study, even one as well designed and executed as the HIE, is not sufficient to answer these questions.

There were some findings from the HIE that raise concerns. There was some evidence that cost sharing could have an adverse effect on the health of those who were *both* sick and poor—not sick *or* poor, but having both characteristics. This could provide an argument for differentially lower cost sharing or the elimination of cost sharing for this group.

The prepaid versus fee-for-service findings suggest that large drops in inpatient use can be achieved without major adverse effects on the overall populations. This was consistent with the major drops in inpatient use during the 1990s and the spread of managed care and managed indemnity plans. However small the differences in health status, there were major differences in patient satisfaction, which is consistent with the widespread reaction to the spread of managed care.

If cost sharing coupled with stop-losses can reduce healthcare costs without much risk to the health of the general nonelderly population, then is the long-term decrease in cost sharing responsible for a large part of medical care inflation? The answer is “Probably not.” It is true historically that more generously covered services have experienced more rapid inflation than less generously covered ones. But the magnitude of the post-HIE changes in healthcare utilization (visits and stays) is not enough to account for medical care inflation; it is not the demand response to cost sharing per se that increased healthcare expenditures. That part is too small. It appears that the relation of costsharing to the rapid growth in healthcare expenditure is more complex and involves linkages to more rapid rates of technological progress and adoption of more generously covered service plans by institutions.

Willard G. Manning

See also Coinsurance, Copays, and Deductibles; Cost of Healthcare; Health Economics; Health Insurance; Health Surveys; Newhouse, Joseph P.; RAND Corporation

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<http://www.vanderbilt.edu/AEA>
- American Society of Health Economists (ASHE):
<http://healtheconomics.us>
- Henry J. Kaiser Family Foundation (KFF):
<http://www.kff.org>
- RAND Health Insurance Experiment (HIE):
<http://rand.org/health/projects/hie>

RANDOMIZED CONTROLLED TRIALS (RCTs)

In medicine, a clinical trial is an experimental study conducted on human subjects to answer or confirm a research question. Clinical trials can be designed at the discretion of the researcher and must meet certain ethical criteria to ensure the protection of human subjects. Of the many research design options for clinical trials, the randomized controlled trial (RCT) has evolved as the gold standard in the investigation of several types of treatments, including (but not limited to) new therapies, community interventions, and diagnostic techniques. The RCT is often referred to as a randomized clinical trial, and the terms are used interchangeably throughout the literature.

Historical Beginnings

The earliest reference to research that meets the definition of a controlled trial dates back to 605–562 BC, when King Nebuchadnezzar II carried out the first controlled trial by ordering that a strict diet of meat and wine be followed by a small group of children for 3 years while four

children of royal blood were allowed to exchange bread and water for the required meal. After only 10 days, those who had switched to bread and water appeared healthier than those who ate only wine and meat.

In 1537, the French Renaissance surgeon Ambroise Parè (1510–1590) blended a mixture of oil of rose, turpentine, and egg yolk as a replacement for the accepted regimen for treating open wounds. One day after the unintentional trial, Parè observed that the wounds treated with the traditional formula were swollen and extremely painful, while the wounds treated with the experimental mixture were not painful, indicating that the new balm was more favorable than the oil usually applied.

Active Controls

The Scottish naval surgeon James Lind (1716–1794) is often credited with originating controlled trials, since he was the first to introduce a control group into his experiments in approximately 1747. A control is when the investigator, or the individual conducting the study, controls the treatment or stimulus to be received by the subject. In this context, one can study the treatment or stimulus, defined as the experimental group, by comparison with (or as a supplement to) the standard of care, defined as the control group. Lind studied the great sea plague, scurvy, of the time. On long naval voyages, it was not uncommon for scurvy to kill two thirds of a ship's crew. To prevent scurvy, Lind conducted the first planned, controlled trial, supplementing the diet of a small number of sailors with fresh citrus fruit and lemon juice (the experimental group). He then compared the incidence of scurvy among those men with that among other sailors on the same ship who ate the normal vitamin-poor naval diet (the control group). Finding that citrus fruit prevented the disease, Lind recommended dietary changes for all sailors, which ultimately resulted in the eradication of scurvy from the British navy. Hence, British sailors are still referred to as "limeys."

Blinding and Placebo Control

By 1863, controlled trials began to evolve with more rigorous study designs, including the use of

placebo treatments. A placebo can be considered a type of control in which no active treatment or stimulus is introduced, but rather subjects assigned to a placebo receive an inactive or sugar pill if the treatment is a pill medication or an injection of salt water if the treatment is a fluid injection, or they go through the routine of having an X ray without the instrument being activated. The placebo has the broadest indication in medicine, as it is effective to a greater or lesser extent in almost all medical settings, necessitating additional design enhancements to minimize bias addressing this phenomenon, known as the placebo effect.

The introduction of a matching placebo allows for the blinding or masking of what treatment, if any, the subject is receiving. In controlled (clinical) trials, treatments are often compared to assess the experimental treatment's effect as compared with what should be the noneffective treatment of the placebo. Participants in the control group receive a placebo instead of an active treatment, and the results from the placebo group are then compared with the results from the experimental group, which received the treatment. Blinding can also be used when comparing different active treatments. The process of blinding, with or without the use of a placebo, helps control for bias that is introduced if the subject or the researcher (or both) is aware of the treatment group to which the subject has been assigned. In a single-blind design, the subjects do not know what treatment they are receiving. In a double-blind design, neither the person delivering nor the one receiving the therapy knows which treatment has been assigned.

Randomization

In 1912, the U.S. Congress passed the Sherley Amendment to the 1906 U.S. Food and Drugs Act, prohibiting labeling medicines with false treatment claims. This amendment ultimately raised experimental standards to the level of requiring the conduct of controlled trials for new treatments. This stimulated the growth of the RCT and further added to the design rigor expected to prove the effectiveness and safety of drugs approved for marketing in the United States.

Generally, a researcher uses randomization to indiscriminately allocate subjects between or among the different treatments or stimuli, thus

performing a “randomized” controlled trial. The major strength of this approach, known as random assignment, is a theoretical equal distribution of potential confounding factors that are known, unknown, or not measurable. Without this, the treatment groups may be different and not comparable. Because biases are minimized by randomization and the treatment groups are directly comparable as a result, associations demonstrated in RCTs are more likely to be causal associations than those demonstrated using other research study designs. If the study is powered sufficiently (i.e., is sufficiently large to detect true differences), the assigned treatment is the most likely explanation of any observed differences in the outcomes, whether an improvement or a worsening of the disease state, between the treatment groups.

The English statistician Sir Ronald Aylmer Fisher (1890–1962) first introduced randomization in the 1920s in the science of agriculture. In Fisher’s experiment the assignment of a plant strain to a plot of land was made randomly. In a controlled (clinical) trial, the same principle results in the assignment of a treatment to subjects by chance, by placing the subjects randomly into three treatment groups (i.e., subjects are assigned to the active treatment group, to the nonactive treatment group, or to the placebo group). In this example, effective randomization would give a subject a 50% chance of being in any one treatment group or arm. This technique deliberately introduces noise into the study such that, over all RCTs that could have been conducted with the experimental treatment, each subject has an equal chance to be in any one treatment group or arm. Therefore, Fisher’s technique, adding the noise of randomization to a controlled trial, allows for a fair comparison to be made between treatments.

In 1879, while at Johns Hopkins University, the American mathematician Charles Peirce (1839–1914) may have been the first to use randomization in a research study, to see if blindfolded people could notice the difference between a 1- and a 2-kilogram weight. Peirce would add or remove weight based on a specially designed deck of cards so as to remove the bias from the researcher making the weight adjustments.

Among the earliest randomized trials was one by the American physician James Burns Amberson Jr. (1890–1979). Amberson, an international

authority on chest disease and tuberculosis, conducted a controlled (clinical) trial from 1926 to 1927 (published in 1931) of sanocrysin, a gold preparation, in pulmonary tuberculosis. The study used a flip of a coin to assign treatment to groups receiving either sanocrysin (active group) or distilled water (control group). Subjects were not aware of which treatment was administered.

A subsequent study, often referenced as the first documented trial to correctly use randomization to assign subjects to treatment and control groups, was carried out by the British Medical Research Council (MRC) in 1948 and involved the use of streptomycin to treat pulmonary tuberculosis. The British statistician Sir Austin Bradford Hill (1897–1991) played a major role in designing the trial, which featured a double-blind assignment to treatment groups, where neither the researchers nor the subjects knew which treatment group each subject was in during the conduct of the study, enabling unbiased analysis of the results.

Randomizations are usually balanced to ensure that, overall, the same quantity, or number, of subjects receives each of the available treatments; this is referred to as a simple or nonstratified randomization. A stratified randomization can be used to minimize the risk of imbalance or bias occurring because of the preponderance of a particular factor relative to the disease or its treatment in one of the treatment groups. To do this, the subjects are separated into groups (or the groups are predefined if the subjects have yet to be identified) according to the factors that are important, such as age, duration of illness, laboratory value, etc. A separate randomization plan or schedule is then prepared for each predefined group.

Multicenter Trials

Multicenter RCTs were first used in the 1940s. Multicenter studies are conducted at several different sites or locations, but all use the same research protocol. When numerous subjects are necessary to detect a meaningful difference in treatment, multicenter studies are typically conducted, making the studies large in scale. Data collected from subjects treated at each site can be pooled so that the greater numbers give increased statistical “power” to the overall results found. Multicenter RCTs are most commonly conducted by government and industry

researchers and in some instances also by not-for-profit health organizations.

Trial Design

When comparing different treatments in an RCT, subjects may be given only one of the treatments prospectively as part of a parallel group design, or all treatments, each on different occasions, as part of a crossover design (also called within-subject comparison).

In the parallel-group study of treatments, each subject would be randomized to receive only one treatment. In the crossover study of treatments, each subject would receive each treatment one after the other. With the crossover design, the order in which the treatments are given is random to avoid the best or worst treatment always being taken first, thereby minimizing any bias in the results obtained from the alternative treatment. Depending on the type of treatment, there may also be a washout period (e.g., a period when the drug is shed from the body until there is no trace of the drug) between crossover design treatments such as placebo, no treatment, or an alternative noncompeting treatment (e.g., one that satisfies the needs of the subject in minimizing discomfort). The crossover study design typically requires fewer subjects than the parallel-group design, but the disease itself may have changed over the time of the treatment period, confounding the results, and the studies typically take longer to conduct, making the crossover study less favored and the parallel-group design the most commonly used.

Human-Subject Protection

RCTs should be carried out adhering to accepted standards of safety, subject welfare, and data interpretation. However, history shows that subject welfare was not always a high priority. To prevent atrocities such as those that occurred in World War II, the Nuremberg Code was developed in 1947. With it, the mid 20th century witnessed a period of protectionism for human subjects. The protection of human subjects has had an impact on the conduct of RCTs, as represented in the World Medical Association's development of the Declaration of Helsinki (first released in 1964, and subsequently amended in 1975, 1983, 1989, 1996, 2000, and 2001).

Most recently in 2001, the Declaration of Helsinki was revised to reaffirm its position that extreme care must be taken in conducting a placebo-controlled trial and that in general this methodology should only be used in the absence of existing proven therapy. However, a placebo-controlled trial may be ethically acceptable, even if proven therapy is available, if there are compelling and scientifically sound methodological reasons for its use—for example, if it is necessary to determine the efficacy or safety of a prophylactic, diagnostic, or therapeutic method or if a prophylactic, diagnostic, or therapeutic method is being investigated for a minor condition and the subjects who receive the placebo will not be subject to any additional risk of serious or irreversible harm. An investigator must propose and defend such research to an institutional review board (IRB)/institutional ethics committee for review to gain conduct approval.

Problems

RCTs are not without their problems. Conducting an RCT often has potential problems inherent in the study design and can be ethically and logistically challenging to perform. Examples of ethically problematic RCT designs include the use of a placebo when an alternate therapy is available, the use of a surrogate end point when the target end point is not reasonably attainable, or the establishment of a short-term follow-up period when the treatment may be intended for long-term application. In addition, randomized controlled (clinical) trials are expensive and artificial. The RCT results are applicable to efficacy (the effect of the treatment or stimulus in a controlled environment) but may not demonstrate effectiveness (the effect of the treatment or stimulus in an uncontrolled environment). This can be further explained by assuming that the severity of a disease is normally distributed, whereas an RCT is designed to include eligible subjects typically represented at the extremes from the mean, median, or mode to demonstrate a pronounced effect of the treatment or stimulus as compared with the control. Thus, the RCT does not represent a typical response expected from the majority of subjects that lie within a few standard deviations of a disease state distribution. However, when an RCT is robustly designed and of sufficient size, the

results of the trial can be applied to the general population.

Future Implications

RCTs continue to be the gold standard for demonstrating safety and efficacy and will continue to be the model by which other experimental designs are judged, but they likely will continue to be critiqued. In the future, there will be continued scrutiny of the controlled (clinical) trial and its inherent design efficacy as opposed to effectiveness, especially considering public concerns over pharmaceutical treatment risks not fully elucidated until after FDA approval for use among the general population, leading to product withdrawals and black-box warnings. Additionally, U.S. policymakers have not fully endorsed the 2001 amendment to the Declaration of Helsinki and its limits on the use of placebos, in terms of the conduct of RCTs for novel treatments. It is important to note that regulatory agencies are beginning to make changes in their standards for approval of new drugs for the good of public health, but further discussions and development of policies are needed. There will be continued examination of the increasing expenditures for the development of novel treatments and of the development costs of conducting the RCTs necessary for approval, estimated at more than \$1 billion for every new treatment in the United States. While there should always be a balance between medical progress and public health, the regulation and policy analysis of controlled (clinical) trials must ensure that this balance is acceptable and reasonable.

Daniel J. O'Brien

See also Association for the Accreditation of Human Research Protection Programs (AAHRPP); Epidemiology; Ethics; Evidence-Based Medicine (EBM); Pharmaceutical Industry; Public Health; Quality of Healthcare; U.S. Food and Drug Administration (FDA)

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- U.S. Food and Drug Administration (FDA): <http://www.fda.gov/oashi/clinicaltrials/default.htm>
- World Health Organization (WHO), International Clinical Trials Registry Platform (ICTRP): <http://www.who.int/ictcp/en>

RATIONING HEALTHCARE

Rationing typically refers to the distribution of some good or service insufficient in supply to meet the available demand for it. Most people think of rationing as a situation when scarce commodities such as fuel during wartime are not sufficiently

available. The fuel available could be rationed by price and given to the highest bidder, but such price rationing is seen as unfair. Thus, a system of allocation is designed that seeks to incorporate broader values such as equity, need, potential benefit, fair share, positioning in the queue, and so on.

The situation best exemplifying such scarcity in contemporary America is the lack of available hearts, kidneys, livers, and lungs for transplantation, where need in many cases far exceeds supply. Almost everyone regards price rationing for such available organs as unfair, so an alternative distribution system must be designed. Such distributions have been called “tragic choices” because there is no correct answer on how to do this.

Some analysts note that many of the instances in medicine referred to as rationing do not involve scarcity in that the needed supply is available but consumers are unwilling or unable to pay the price demanded. However, most instances of scarcity are imposed by policy choices reflecting culture and ethical values. There are numerous ways to increase the availability of scarce organs were we not bound by our values and norms. These include allowing people to buy and sell them, paying relatives to agree to the use of organs of their loved ones who no longer have brain function, or appropriating the organs of people who are brain dead by fiat regardless of family wishes. Or we can do what occasionally has been done in China—take the organs of prisoners following execution or soldiers killed in war. We can even imagine societies where people are bred for spare organs. Most societies view all the above solutions to scarcity as unethical.

Price Rationing

It is commonly asserted that healthcare is not rationed in America. This might be substantially true if price rationing is excluded. Our healthcare system has the capacity to provide an adequate level of care to all who need it. But many lack access because they are uninsured or have little of the disposable income needed to purchase care. Thus, many people forgo needed care because of cost and as a consequence have poorer health. To most economists, allocation by price is simply an instance of supply and demand. Most people would not think that luxury cars are rationed simply

because many persons cannot afford to buy them. But societies think differently about some necessities such as healthcare than about ordinary commodities. The special claims for healthcare stem from the belief that adequate health is a precondition for fair competition.

Levels of Rationing

Most nations seek to control the resources devoted to healthcare relative to other societal needs. The United Kingdom, for example, establishes a central health budget each year and seeks to live within it, while other nations use a variety of price controls and other regulations to hold healthcare expenditures in check. Since no nation provides all the care the population would wish, all must have some rationing rules to determine the distribution of available health resources.

The rationing context is established in most countries by macro decisions that shape the amounts and types of care available: decisions concerning the number and types of health professionals trained; the distribution of funds among varying types of technologies, services, and specialists; the numbers and locations of hospitals and clinics built; the definition of reimbursable providers; the amounts of payment for varying kinds of services; the distribution between primary-care physicians and specialists and among different types of health professions; and the distribution of funding among types of providers and geographic locations. These decisions may be more or less centralized and involve fierce politics and interest-group advocacy. The history and culture of each country shapes the design of benefits and the extent to which patients are expected to share in the costs. Definitions of care services will vary among nations. In some, respite care in spas is covered under the basic health plan.

Some planning decisions may remain highly centralized, such as decisions about overall budgets, new hospital buildings, or acquisition of new, expensive technologies, while others may be delegated to regions or local entities and provider organizations, such as insurance plans, hospitals, clinics, and provider groups. Managers in these more decentralized settings make many intermediate decisions, such as how to distribute their available funding, the numbers and types of reimbursable

facilities and providers, the balance between general practice and specialty care, the numbers of specialists in each type of service, and the like. These decisions will make care more or less available in varying categories, such as cardiac care or mental health, and make rationing more or less needed, depending on the resources allocated to each function.

Many rationing decisions are predetermined by benefit design and coverage decisions by the purchaser (government) of the healthcare plan. Important services may or may not be covered or may be restricted in various ways, such as dental care, prescription drugs, long-term care, certain preventive services, specified surgical interventions, some appliances and devices, and so on. All healthcare systems exclude some services seen as less important or too expensive, such as various cosmetic surgical interventions, some reproductive services, "lifestyle" drugs, psychoanalysis, and the like. These decisions may be controversial and politically contested, but they are part of the overall design process. Decisions made at the point of service are much more difficult, because people cannot access care or are denied services they believe they need at the point where they believe their health is at stake.

Explicit and Implicit Rationing

A central issue is the extent to which rationing should be allowed at the point of service delivery and whether it should be explicit or implicit. One advantage of implicit rationing, where clinicians make discretionary judgments about what services to provide, is that it more readily takes account of differences in medical and social circumstances, patient preferences, and situations that cannot be known beforehand, given the iterative nature of patient care and decision making. Thus, it is flexible and readily adaptable to different and changing situations. Its strengths are also its weaknesses, in that it makes decision making less transparent and opens greater opportunities for personal bias and discrimination under the guise of clinical decisions. Physicians sometimes make care decisions on the basis of age, gender, race, and other prejudices and may respond differently if they like or dislike particular patients.

Critics of implicit rationing seek more transparent decision making and clear, explicit rules about who should have access to varying interventions. They also see this as a way to ensure professional accountability. They commonly advocate having such rules established through public participation so that decisions reflect the dominant values of the community. The most publicized effort to develop rules for explicit rationing was the Oregon Health Plan, which sought to provide healthcare coverage to more people by rationing the services available. Efforts were made to distinguish between more and less useful interventions in order of priority as a way of defining the services available within that state's Medicaid program. Oregon began with a series of public meetings and meetings of various advisory committees, to develop consensus on priorities. Through this exercise, medical services were classified into a number of condition-treatment pairs that were ranked and prioritized through judgments of medical efficacy and community values. Initially, 700 categories were established, but it was determined that the state budget could only support the first 588.

When the rankings were examined, there were a variety of seemingly bizarre outcomes. Tooth capping, for example, ranked higher than surgery for ectopic pregnancy or appendectomy, interventions that save lives. Thus, the rankings were criticized for failure to give the "rule of rescue" sufficient priority and for other reasons. The list was then reordered to give more influence to clinical understanding. The public was involved, but most participants in the various meetings and committees were health professionals. Observers viewed the process as a rational and fair way to make difficult decisions about allocations of limited budgets. The system was never really implemented as expected, and relatively little rationing actually took place. All such efforts function in a broader political, organizational, economic, and social context, and implementation depends on factors that may have little to do with the approach itself.

The psychometric techniques used are uncertain because of the difficulty of rating needs and experiences one has not personally encountered. The general public makes different assessments from those who actually have the illnesses in question. Moreover, explicit rationing has many problems beyond the technicalities of developing rational

and evidence-based priorities. Given the complexities of people's lives and their medical histories and varying social situations, it is impossible to anticipate all the issues that may arise in caregiving. Explicit decisions can be inflexible and misdirected. It is also difficult to modify them in a timely way as new knowledge and understanding evolves.

In the United States, rationing has largely involved excluding many services in the benefit design, requiring cost sharing when using services, and requiring waits to get appointments to see the physician. Most denials do not occur at the point of service, and patients commonly do not think of these access limitations as rationing. Managed care changed this a great deal in the 1990s by explicitly denying care at the point of service. The rationing approaches used by managed-care organizations included utilization review (precertification for and concurrent review of inpatient care and other expensive interventions), requiring clients to enroll with a primary-care physician from a predetermined list, and requiring formal referrals for specialty care. Prescription plans similarly developed drug formularies and required substitution of generic for brand-name medications. They sometimes limited the number of prescriptions a patient could fill in a month (as in some state Medicaid programs) and limited the number of pills a patient could receive per month (as in coverage for lifestyle drugs such as Viagra). This was the first major experience American patients and physicians had with explicit rationing at the point of service, and they disliked it, resulting in a major backlash. Many of these controls were then relaxed, contributing to a new cost spiral.

Explicit rationing at the point of service is "rationing in your face" and is less acceptable than more impersonal types of explicit rationing, as in benefit design. The most successful types of rationing are often those that people don't perceive as rationing at all. When people and their loved ones are seriously ill, most will use every means to get the services they believe they need. Thus, rational efforts under managed care to limit some types of care resulted in public attacks and litigation, leading managers to back down in order to avoid bad publicity. One example was bone marrow transplants in patients with advanced breast cancer, a treatment ultimately proven to have no value in such instances. But explicit rationing is inherently political, and the transparency of decision making

encourages confrontation and public acrimony. Although implicit rationing is less fair and more easily open to favoritism, it allows people's preferences to be met when some feel more strongly than others. But it also gives advantages to those who are more educated and sophisticated and who know better how to manipulate bureaucratic systems. Nevertheless, explicit rationing at the point of service is extraordinarily difficult to sustain politically. Few successful examples exist beyond organ transplantation.

Types of Rationing

The easiest types of rationing are often those where the public fails to perceive it. Rudolf Klein and his associates have described seven types of rationing. The most apparent is denial of service because individuals lack health insurance or cannot pay the required cost or because the managed-care reviewers do not believe that the service is justified. Rationing by selection refers to the choice of individuals among competing patients because of assessments of likelihood of benefit, place on a queue, or some rule about what is fair. Rationing by deflection refers to sending patients elsewhere because of heavy load, as often occurs in ambulance deflection from emergency departments or "turging" what are seen as undesirable patients (because of age, chronicity, or social characteristics) to some other service. Rationing by deterrence involves making it difficult to receive a service by unresponsive telephone systems, inaccessible locations, dismissive receptionists, dismal surroundings, and making people feel unwelcome. A related type of rationing is by delay, making it difficult to obtain an appointment or very long waiting times in the clinic or office. A particularly serious form of deterrence involves marketing efforts by health plans that avoid enrolling people with serious illness by making program enrollment less accessible to them. Rationing also occurs by dilution, involving short consultations with little content and the need to make repeated visits for basic services that could be provided in fewer visits. Finally, some patients face rationing by termination when they seek services but are told that nothing more can be done for them and health personnel withdraw. Such rationing commonly occurs at the end of life.

Setting Limits Fairly

It is inevitable that more rigorous rationing will be needed as new technologies and rapidly developing biomedical science provide new and expensive possibilities for treating disease. Some believe that given the large amount of waste in the U.S. health-care system, it will be possible to improve access and quality without rationing care by introducing new organizational rationalities, restructuring physician and hospital payment and other incentives, and emphasizing evidence-based treatment. However, this may be wishful thinking. Healthcare in America has always been rationed in the ways described and likely will be rationed even more as new possibilities pose enormous cost demands. The hope is that we can ration in constructive and health-promoting ways rather than simply allocating care to those with the greatest ability to pay. Rational allocation schemes require significant changes in healthcare practice organization and broad implementation of information technology, but American medicine has been slow to make these changes. The experience of large practice systems such as the Veteran's Affairs (VA) health-care system and large health maintenance organizations (HMOs) such as Kaiser-Permanente suggests that change is feasible.

One major challenge is to have the capacity to make evidence-based assessments credible to the public and insulated from everyday political pressures and influences. One example is the United Kingdom's National Institute for Health and Clinical Excellence (known as NICE), which makes such judgments and gives advice to the National Health Service (NHS). A number of models have been proposed for such a function in the United States, including one fashioned like the U.S. Federal Reserve System, which makes monetary policy significantly insulated from everyday political pressures. Some large organizations such as the VA and Kaiser-Permanente have their own processes to make such judgments, building on evidence from sophisticated databases such as those maintained by the Cochrane Collaboration, a large effort to bring together and assess the findings from randomized controlled trials and other research from all over the world.

Knowing the evidence, however, does not ensure a fair and credible allocation process. Norman

Daniels and James Sabin have developed a rationing approach to achieve legitimacy with patients. They call their approach "accountability for reasonableness" and define four necessary elements. First, they argue, decisions and their underlying rationales must be public and easily accessible. Here they endorse, as do many ethicists, explicit rationing. Second, the decisions must be based on evidence, principles, and justifications that all participants see as relevant to decisions about how best to allocate resources that are too few to give everyone whatever they might demand. Third, they recognize the uncertainties in medical care and do not demand certainty but maintain that the evidence and decision making should be plausibly consistent. Fourth, any decisions should be open to challenge and revisable when new information becomes available. In short, there must be clear organizational mechanisms in place to appeal against and revise decisions. Finally, there must be organizational mechanisms in place to ensure that the aforementioned conditions are met. No system has implemented this approach in full, although some of the elements have been used in particular kinds of decisions in some organizations. It is not clear, however, if this explicit rationing approach can be implemented to its full extent for the reasons discussed earlier. However, such thoughtful theory is helpful as we go forward.

Rationing remains an unbroachable topic in discussions of American healthcare, and professionals and patients commonly believe the myth that healthcare is not rationed. If we are to make thoughtful and prudent decisions, the public must understand rationing realities. The question is not whether to ration but how to ration more thoughtfully and effectively. This will be a continuing challenge.

David Mechanic

See also Access to Healthcare; Cost of Healthcare; Economic Barriers to Healthcare; Health Economics; Medical Sociology; Public Policy; United Kingdom's National Institute for Health and Clinical Excellence (NICE); U.S. Department of Veterans Affairs (VA)

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<http://healthconomics.us>
- American Sociological Association, Medical Sociology
Section: <http://dept.kent.edu/sociology/asamedsoc>
- Brookings Institution: <http://www.brookings.edu>
- National Center for Policy Analysis (NCPA):
<http://www.ncpa.org>

REGULATION

Regulation is the formal process through which health policy governs behavior. It takes the form of rules, procedures, adjudications, and administrative actions implemented by a regulatory authority. Such an authority can function at the federal, state, or local governmental level or through numerous private organizations. Because of the breadth of the healthcare industry, the regulatory framework is particularly complex.

Health services researchers study the effects of regulation as a tool for achieving policy goals. Such investigations are often referred to as program evaluations, as they evaluate the effectiveness of regulatory programs. The outcomes of health services research may also influence the development of regulations and of legislation that forms its legal basis. Research findings are often cited by members of the U.S. Congress, state legislators, members of private bodies, and courts in the development and evaluation of regulatory policy.

Health services research is itself subject to regulation. The National Research Act of 1974 requires that all federally funded research involving the use of human subjects be approved and supervised by an institutional review board (IRB) at the sponsoring institution. IRBs are composed of professional peers of the investigators and members of the community at large, and their role is to ensure that subjects are adequately protected, in particular through procedures for obtaining informed consent concerning possible research risks. The federal Health Insurance Portability and Accountability Act of 1996 (HIPAA) limits the use and distribution of medical information that can identify individual patients. Health services researchers who rely on clinical data must either use information from which patients cannot be identified or obtain the consent of the patients involved.

Purpose and Functions

The primary purpose of government regulation is to develop and enforce the detailed rules that effectuate statutes. When the U.S. Congress or a state legislature enacts a law, it cannot account for all the technical aspects of implementation, as legislators do not have the time or the expertise to do so. Statutes typically set overall policy guidance in a field and direct an agency to bring it to fruition. For example, the U.S. Congress mandated that the Food and Drug Administration (FDA) ensure the safety and efficacy of all new drugs and devices but left it to the agency to determine the manner in which clinical testing will be conducted. The legislature in every state has required that physicians be licensed by a medical board to practice and directed these boards to set the actual qualifications for licensure.

In a private context, regulation implements policy decisions of professional and industry organizations. For example, the hospital members of the Joint Commission seek to have all institutions function at a uniform level of quality. Committees within the organization devise the actual standards that must be met to exhibit quality and the procedures for enforcing them. Similarly, the physician members of medical specialty societies seek to ensure that practitioners display minimum levels of skill and competence. Committees of these bodies develop examinations and practice guidelines to assess these attributes.

Government regulators serve four main functions. First, they promulgate rules and standards that fill in the details of legislation, as when the FDA specifies the procedures for testing a new drug. This activity is known as rulemaking. Second, they conduct adjudications that enforce those rules and that grant rights and privileges under them, such as the right to practice medicine. Third, they administer government functions, such as hospital operations in the Veterans Administration (VA). Fourth, they disperse funding for targeting purposes—for example, support for biomedical research by the National Institutes of Health (NIH).

In performing these tasks, regulators take on the roles of each branch of government. Rulemaking extends the reach of the legislative branch by adding detailed directives to the general guidance contained in laws. Adjudication mimics the activity of the judicial branch by resolving disputes over regulatory enforcement. Administration of government operations and of funding programs carries out functions of the executive branch by directly managing government activities.

Regulatory authority may be vested in bodies known as boards, commissions, agencies, or departments. They are headed by officials who are appointed by the president or, for state-level programs, the governor, and who are generally subject to confirmation by the Senate or the state legislature. When there is a single agency head, leadership changes with each new administration. Members of boards and commissions are often appointed for fixed terms that are staggered to extend beyond election cycles in order to provide for continuity of leadership across administrations. Senior agency officials just below the top leadership also tend to be political appointees. Their role

is to provide overall policy guidance. Most of the day-to-day work of regulatory agencies is conducted by a permanent professional staff.

In cutting across the traditional divisions of responsibility between branches of government, regulators play an anomalous role. They derive their authority from legislative enactments, yet they are directly accountable to the executive that appoints their leadership, and all their actions are subject to review by the courts for consistency with the underlying statutes and with the federal or state constitution. The mixing of governmental roles has at times proved controversial, in that it can be seen to blur the conventional separation of powers.

Process

Under the constitution, basic legal powers are vested in the states unless one of several enumerated national concerns is involved. Therefore, most regulation of routine aspects of healthcare, such as medical practice, hospital operations, and sanitation, fall under the jurisdiction of state agencies. States may delegate some of these functions to municipal and county governments, as is the case, for example, for restaurant inspections. Most federal regulation of healthcare falls under the constitutional authority to regulate interstate commerce, as seen in the regulation of drugs by the FDA, or under the power to spend funds to address national needs, as is done in the Medicare program.

Private regulators are usually sponsored by the regulated industry or the profession itself, as in the examples of the Joint Commission and medical specialty boards. They do not exercise actual legal authority to govern behavior and cannot impose legal sanctions for violations of their rules. Their power derives from their ability to influence reputations and professional recognition. The Joint Commission does not determine whether or not a hospital may legally operate, but accreditation by the Joint Commission adds essential credibility to an institution's claim to quality, and it is required for reimbursement by virtually all governmental and private payers. Board certification does not control the legal right to practice medicine, but it exerts similar effects on credibility and reimbursement eligibility.

Government regulators are subject to the restrictions on authority contained in the federal constitution. In particular, they may not violate the rights of those whom they oversee to due process when life, liberty, or property are at stake. Healthcare regulation affects property interests in many ways—for example, by controlling a physician's ability to earn a living, determining when a drug company can sell a new product, or deciding when a hospital can construct a new facility. Due process requires that such actions be taken only after full consideration of all relevant factors and after all affected parties have had a chance to be heard. As a guide to ensure that these steps are taken, the U.S. Congress in 1946 enacted the Administrative Procedures Act (APA), which imposes standards that federal regulators must follow. Most states have similar laws.

To meet the Administrative Procedures Act's requirements, regulatory actions must be preceded by a series of prescribed steps. The agency involved must conduct a thorough fact-finding effort that builds a record to support the action. Adequate notice must be provided to the general public of pending activities, which is generally accomplished through publication in a regular journal of the federal government known as the *Federal Register*. Particular care must be given to notifying parties who may be directly affected by an adjudication. Those with a direct interest in the outcome must also be afforded the opportunity for input through written comments or at a hearing, and after an initial decision is made, they must be able to bring an appeal. At the end of the process, a regulatory action is considered final, but appeal to the courts is still possible. They can review regulatory actions for consistency with the APA, the underlying statute that authorized the action, and the Constitution.

Private regulators are not components of the government, so they are not subject to the Administrative Procedure Act. However, there are several legal rules that circumscribe their actions. They may not discriminate based on impermissible factors such as race, religion, or national origin. In many states, they are subject to a requirement of "fundamental fairness" in their actions. They may also be held accountable for complying with their own internal rules and bylaws. Some private organizations that exercise regulatory powers, such as hospitals that grant staff privileges to physicians, are considered by

the courts to be "quasi-governmental" actors because of their tax-exempt status and receipt of government funding. This brings with it a requirement to provide due process for parties affected by their actions. Beyond these legal dictates, private regulators also have a strong interest in safeguarding their own reputations for fairness, if they are to remain credible as arbiters of professional competence and quality.

History

Over the course of the past 150 years, the focus of healthcare regulation has expanded, so that it now covers almost every aspect of the field. For the most part, each regulatory program addresses one of three key policy concerns—enhancing quality, ensuring access, or controlling costs. As the focus of policy has shifted over the years, new programs have been added by a range of different authorities, and in many instances sets of regulatory requirements are layered, one upon another.

The earliest regulation of healthcare in America addressed public health concerns. As science first revealed the role of germs in causing disease and as the means of contagion, state and local governments responded with preventive measures. These included sanitation, clean drinking water, food inspections, mandatory vaccinations, and quarantine in the face of epidemics. At the start of the 20th century, the quality of healthcare services and products became the focus as states imposed licensure requirements for physicians and private bodies affiliated with the umbrella professional organization for the medical profession, the American Medical Association (AMA), instituted procedures for accrediting the medical schools at which their members trained. In 1906, the U.S. Congress passed the first national drug safety law and established the FDA. The law was overhauled and strengthened in 1938 and again in 1962. In overall effect, these actions improved the level of quality in American healthcare and to a sufficient extent that by the 1920s the country could claim a credible system.

During the mid 20th century, the focus of regulatory activity turned largely to enhancing access. State laws passed in the 1930s facilitated the first Blue Cross and Blue Shield plans that provided insurance on a nonprofit basis. A federal ruling in

1943 helped link insurance to employment. The War Labor Board exempted employer-paid insurance premiums from a freeze on wage and price increases during World War II and permitted firms to add health coverage as a fringe benefit without restriction. Further encouragement for this benefit came after the war, when the Internal Revenue Service (IRS) ruled its value to be exempt from the calculation of income for purposes of taxation. In 1946, the U.S. Congress passed the first major federal healthcare spending initiative in the form of the Hill-Burton Act, which allocated billions of dollars for hospital construction, especially in rural areas.

The most significant regulatory expansion of access occurred in 1965 with the enactment of Medicare and Medicaid. These programs offered insurance to millions of citizens who lacked eligibility for employer-sponsored coverage—Medicare to the elderly who were no longer working and Medicaid to several categories of the poor who lacked employment. The programs were supplemented in 1997 by the state Children's Health Insurance Program (SCHIP), which permits states to extend coverage to children of families with incomes that are low but not low enough to qualify for Medicaid. In exercising its spending power through these programs, the U.S. Congress has added various regulatory restrictions over the years. For example, to receive reimbursement, institutions and practitioners must meet quality criteria embodied in the conditions of participation. Hospitals that operate emergency rooms, a category that includes almost all, must provide open access regardless of ability to pay. All providers must structure their financial dealings to avoid the exchange of remuneration in return for the referral of patients.

Not surprisingly—to many healthcare analysts—the expansion of access that Medicare and Medicaid achieved imposed tremendous pressure on costs, and healthcare spending in the United States began to accelerate rapidly in the late 1960s. In response, many regulatory programs enacted over the next 30 years focused on different kinds of cost control strategies. In 1973, the U.S. Congress passed the Health Maintenance Organization Act to encourage the use of managed care. The next year, it passed the Employee Retirement Income Security Act (ERISA) to assist

large, multistate employers in self-insuring for employee healthcare expenses. During the 1970s, all states passed, with federal encouragement, certificate-of-need (CON) programs to limit the expansion of healthcare services and facilities that were deemed superfluous. In 1983, the U.S. Congress changed the mechanism for reimbursing hospitals under Medicare to a prospective payment system based on Diagnosis Related Groups (DRGs) to eliminate incentives for overtreatment.

The actual effectiveness of these programs in stemming the rise in healthcare spending has been a matter of debate among health policy analysts and health services researchers. Costs for healthcare services continue to rise relentlessly and represent more than 16% of the gross domestic product (GDP), more than the proportion in any other country. However, from a research perspective, cost control programs have provided considerable fuel for studying the effects of economic incentives on the behavior of institutions, practitioners, and patients.

More recent regulatory programs address a range of concerns. Various federal and state reporting laws require that government authorities be informed of medical errors, which have been found to represent a major threat to quality, especially in hospitals. The U.S. Congress has empowered the FDA to take more assertive action when safety hazards are discovered in approved drugs. Access to prescription medications was expanded for the elderly with the enactment of Part D of Medicare. HIPAA restricts the ability of insurers to refuse coverage based on preexisting conditions to members of employer-sponsored groups.

In separate provisions, HIPAA also protects the privacy of patient medical information. This last regulatory thrust may be a harbinger of much future health policy. Healthcare has been slower than many other industries to adopt information technology, but substantial efforts are under way to accelerate the computerization of many aspects of the industry. This trend will raise new kinds of concerns, particularly regarding threats to patient privacy, that regulatory policy will have to address. Other applications of information technology, such as electronic medical records, telemedicine, and Internet-based services, will undoubtedly also command the attention of policymakers to an increasing extent as inevitable issues and conflicts arise.

Current Regulatory Structures

With a history of over 100 years of expansion, regulation today affects almost every aspect of American healthcare. In most cases, a variety of regulators, rather than a single authority, is involved. Each sphere of the industry is subject to its own complex structure, characterized in most cases by a dynamic interplay between oversight bodies and programs that have arisen at different times.

Physicians and other healthcare professionals are subject to licensure at the state level. Many healthcare professions also maintain a certification process through which expertise in a specialty is recognized. To achieve a financially viable practice, most kinds of practitioners must also meet the conditions for participation in Medicare and Medicaid and abide by the requirements for participation in the provider networks of private managed-care organizations should they wish to qualify for reimbursement. Physicians who seek to practice at or admit patients to a hospital are also subject to review and supervision by that institution's credentials committee.

Hospitals and other healthcare institutions are similarly subject to licensure by the states. Most also seek accreditation by the Joint Commission. About two thirds of all states maintain CON laws, which restrict the ability of hospitals to add new services or facilities without state approval based on a demonstration of community need. Hospitals must also abide by the numerous requirements that go with receipt of Hill-Burton funding, including nondiscrimination, indigent care, and maintenance of emergency rooms, and by additional rules that accompany participation in Medicare.

Healthcare finance in America has substantial components at both the private and the governmental level, both of which function within a complex regulatory framework. The business of insurance is regulated by the states, but ERISA preempts state authority over some aspects of employer-sponsored coverage, which represents over 90% of the market. In its place, this law provides for minimal oversight of health plan finances by the U.S. Department of Labor. The premiums paid for employment-based health insurance receive favorable tax treatment, which effectively creates a large government subsidy for this kind of coverage.

The federal government finances healthcare directly for the elderly, the totally disabled, and those suffering from end-stage renal disease through Medicare. Government financing is shared jointly between the federal and state governments for those categories of the extremely poor who are covered by Medicaid and for SCHIP. All these programs rely on regulatory mechanisms to operate.

Drugs and other healthcare products are regulated primarily by the FDA. This agency administers a regulatory structure that oversees all aspects of drug and device testing and determines whether test results indicate sufficient safety and efficacy to justify approval for marketing. Once a drug is on the market, the FDA oversees the advertising and promotion of approved products and evaluates postmarket safety data. Manufacturers must also obtain patents from the federal Patent and Trademark Office to protect new discoveries from competition. The federal Drug Price Competition and Patent Term Restoration Act of 1984 determines when generic copies of patented drugs and devices may be manufactured, tested, and sold.

Public health in America, the oldest subject of governmental regulation, is today one of the most disjointed. Most basic public health regulatory functions, such as oversight of sanitation, restaurant inspections, and epidemic investigations, are handled at the state or local level. The federal government takes the lead with regard to food safety. It also coordinates state efforts, monitors national disease trends, and develops recommendations through the Centers for Disease Control and Prevention (CDC). Environmental pollution is addressed by the federal Environmental Protection Agency (EPA) and by similar bodies in many states. Occupational safety and health is primarily a federal concern, subject to oversight by the Occupational Safety and Health Administration (OSHA).

Business relationships between healthcare entities are regulated in distinctive ways that do not apply to other industries. Antitrust laws are enforced by the federal U.S. Department of Justice, the Federal Trade Commission, and many state attorneys general. Federal guidance has been issued to advise healthcare providers that compete with one another on permissible forms of collaboration. Payments that providers exchange to encourage

the referral of patients are strictly prohibited by federal law, and the boundaries of legitimate financial relationships are defined in regulations issued by the Office of Inspector General of the Medicare program. Tax exempt hospitals must abide by the rules of the IRS regarding charitable activities. All healthcare providers are subject to regulations issued under HIPAA concerning the privacy of patient data.

Biomedical and other health-related research is regulated by various government agencies that provide funding and also by the FDA when results are used to support applications for approval of new drugs or devices. The National Institutes of Health (NIH), the largest single research-funding source in the world, reviews proposals of private investigators, as do the National Science Foundation (NSF), the Agency for Healthcare Research and Quality (AHRQ), and other agencies. Scientists who receive support must abide by IRB oversight concerning the use of human subjects and by numerous accounting rules.

Future Implications

Regulation is the force that translates health policy into action. Its scope is broader with regard to healthcare than with regard to most other industries. Healthcare regulators operate at all levels of government and in private settings, and they address, in one form or another, each of the three key policy concerns of enhancing quality, controlling costs, and ensuring access.

To those within the industry, regulation represents a complex and often bewildering array of restrictions. However, it has also helped foster the industry's growth over the past century. Regulatory programs have channeled much of the country's healthcare activity, for example, through the National Institutes of Health (NIH) support for basic biomedical research; enhanced the public's respect for the field, for example, through the licensure of healthcare professionals; and served as the conduit for injecting huge amounts of federal money into the system, for example, through the Medicare program. As a result, regulation serves as both a fertile ground for health services research and an outlet for implementing research findings. Because of the importance of healthcare to the nation's well-being and to its economy, regulation

will always play a central role in determining the industry's shape and in guiding its functioning.

Robert I. Field

See also Accreditation; Antitrust Law; Certificate of Need (CON); Employee Retirement Income Security Act (ERISA); Health Insurance; Health Insurance Portability and Accountability Act of 1996 (HIPAA); Joint Commission; Public Policy; U.S. Food and Drug Administration (FDA)

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 U.S. Department of Labor (DOL): <http://www.dol.gov>
 U.S. Food and Drug Administration (FDA):
<http://www.fda.gov>
 U.S. Government Accountability Office (GAO):
<http://www.gao.gov>

REINHARDT, UWE E.

Uwe E. Reinhardt is a well-known and highly respected health economist and health services researcher. Reinhardt is an insightful, and often humorous, commentator on economic, political, and public policy issues in healthcare. He frequently writes on the uninsured and compares healthcare in the United States with that in other countries.

Born in 1937 in Germany, Reinhardt immigrated to Canada. He earned a bachelor's degree in commerce and economics from the University of Saskatchewan, Canada, in 1964 and was awarded the Governor General's Medal as the Most Distinguished Graduate of his class. He did his graduate work at Yale University, earning a master's degree and a doctorate in economics in 1970.

Reinhardt has taught at Princeton University since 1968, rising through the academic ranks from assistant professor of economics to his current position of James Madison Professor of Political Economy and professor of economics and public affairs. At the university, he has taught courses in micro- and macroeconomics, accounting, financial management, and health economics and policy.

Reinhardt has served on a number of government committees and commissions. He served on the National Council on Health Care Technology of the U.S. Department of Health and Welfare from 1979 to 1982. He was a member of the Special Medical Advisory Group of the Veterans Administration (VA) from 1981 to 1985. He also

served as a commissioner on the Physician Payment Review Commission (PPRC), which advised the U.S. Congress on reforms of Medicare policies for paying physicians, from 1986 to 1995.

He has also served as a member of many private-sector organizations, including the Council on the Economic Impact of Health Reform, the National Leadership Coalition on Health Care, and the National Institute for Health Care Management. He is currently on the board of trustees of Duke University Health System and the Teachers Insurance and Annuity Association. And he is the chairman of the Coordinating Committee of the International Program in Health Policy of the Commonwealth Fund.

Reinhardt is a prolific researcher and writer who has authored or coauthored over 200 journal articles, books, and editorials. He also has served on the editorial boards of many prestigious medical and health services research journals, including *Health Affairs*, *Journal of the American Medical Association*, *Journal of Health Economics*, *Milbank Quarterly*, and the *New England Journal of Medicine*.

In recognition of his work, Reinhardt has received many awards and honors. For example, he was elected to the National Academy of Sciences, Institute of Medicine (IOM), in which he has been a member since 1978. He is a past president of the Association of Health Services Research and the Foundation for Health Services Research. In 2004, he received the Distinguished Investigator Award from AcademyHealth.

Reinhardt has been a consultant to many organizations, including the World Bank, as well as to various federal legislators. He frequently is called to testify before the U.S. Congress.

Erin R. Page

See also Commonwealth Fund; Healthcare Financial Management; Healthcare Reform; Health Economics; Health Insurance; International Health Systems; Public Policy; Uninsured Individuals

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RELMAN, ARNOLD S.

Arnold S. Relman is Professor Emeritus of Medicine and of Social Medicine at Harvard Medical School. He has been a medical research scientist, a clinical practitioner and consultant, a medical-school teacher and department head, a university and medical-school trustee, the editor of two influential medical journals, a writer on medical and healthcare policy issues, and a member of a state board of licensure and discipline.

Born in New York City in 1923, Relman graduated from Cornell University in 1943 and received his medical degree from Columbia University in 1946. After residency training at Yale-New Haven Hospital, he moved to Boston in 1949 to be a National Research Council Fellow in the Medical Sciences at Boston University School of Medicine. He remained on the Boston University faculty, rising to the position of Conrad Wesselhoeft Professor of Medicine and Director of the Boston University Medical Services at the Boston City Hospital. From 1962 to 1967, he served as the editor of the *Journal of Clinical Investigation*. In 1968, he

moved to Philadelphia to become the Frank Wister Thomas Professor of Medicine and chair of the Department of Medicine at the University of Pennsylvania School of Medicine and Physician-in-Chief at the Hospital of the University of Pennsylvania. In 1975–1976, he was a Macy Foundation Faculty Scholar at Oxford University, England, and a visiting scientist in biochemistry at Merton College, Oxford. In 1977, he returned to Boston to become the editor of the *New England Journal of Medicine*, professor of medicine at Harvard Medical School, and senior physician at the Brigham and Women's Hospital. In 1991, he became Editor Emeritus of the *New England Journal of Medicine* and professor of medicine and of social medicine at Harvard University. In 1994, he became Professor Emeritus. From 1995 to 2001, he was a member of the Massachusetts State Board of Registration in Medicine and chair of its committee on quality.

Relman began his career as a medical research scientist and clinical practitioner and teacher. His research focused on renal disease and physiology and on fluid and electrolyte metabolism. He published many original studies that contributed to the understanding of the regulation of acid-base balance by the kidney, the renal effects of potassium depletion, and the diagnosis and treatment of kidney disease. He became a leader in academic medicine, serving as president of major national organizations such as the American Federation for Clinical Research, the American Society of Clinical Investigation, and the Association of American Physicians (the only person to hold all three positions) and as a member of the Council of the National Academy of Sciences, Institute of Medicine (IOM).

When Relman assumed the editorship of the *New England Journal of Medicine* in 1977, his primary interest shifted to healthcare policy and issues of medical professionalism. Since then, he has written widely on the economic, ethical, legal, and social aspects of healthcare and the practice of medicine. In 1980, he published a seminal article, "The New Medical-Industrial Complex," which first called attention to the growing commercialization of medical care in the United States and its consequences. In many articles since then in professional journals and in the lay media, he has continued to explore this theme. Relman has also

been interested in the ethical and professional principles that govern the writing, editing, and publishing of medical research reports. He was a cofounder, in 1978, of the International Committee of Medical Journal Editors, which has promulgated influential guidelines in this area.

In 1966 and 1974, Relman was a coeditor of two volumes of *Controversy in Internal Medicine*. In 2007, he published *A Second Opinion: Rescuing America's Health Care*, which summarizes his assessment of the problems of healthcare in the United States and proposes major reforms in both the insurance and the delivery systems. In this book, he says that the uniquely high costs of the nation's healthcare are due primarily to the investor-owned businesses that own most of the private insurance system, most of the ambulatory services and facilities, and a large fraction of the short- and long-term inpatient facilities. He argues that investor ownership demands continued growth of income and this has changed all of the system into an expanding commercial market that has become unaffordable. As a solution, he proposes a publicly regulated single-payer insurance system and a not-for-profit delivery system based on prepaid multispecialty medical groups with salaried physicians.

Marcia Angell

See also For-Profit Versus Not-For-Profit Care; Health Services Research Journals; National Health Insurance; Physicians; Physician Workforce Issues; Politics of Healthcare Reform; Public Policy.

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RESOURCE-BASED RELATIVE VALUE SCALE (RBRVS)

The Resource-Based Relative Value Scale (RBRVS) is the method used to construct Medicare's physician payment schedule for ambulatory services. The RBRVS transformed the way physicians were reimbursed by establishing a method of standardization of payment. Other nations have also used the method to reimburse their physicians.

Background

The method and rate of physician payment constitute powerful incentives under which physicians make clinical decisions, such as how much time to spend with patients and hours of work supplied. Fee-for-service is the dominant payment method for physician services in most countries, including the United States, Germany, Canada, Japan, Australia, and Singapore. Their fees are largely based on what physicians have charged in the market place. In a market economy, prices are determined by supply and demand and by competition. However, nations have learned from experience that the market for physician services does not satisfy the conditions that define a reasonably competitive market. These imperfections in the market often distort the payment rates for different services.

First, widespread health insurance coverage reduces patients' sensitivity to fees. Physicians can overcharge patients, particularly for the diagnosis and treatment of urgent and life-threatening medical conditions. Moreover, there is an asymmetry of information between physicians and patients.

While in a few specialties, such as family medicine and pediatrics, patients may be able to make reasonably informed choices, in others, such as oncology and neurosurgery, patients have to rely primarily on physicians' decisions. Consequently, physicians can induce demand and raise their fees. Finally, legal restrictions specify who can provide medical services, admit patients to hospitals, and prescribe drugs. Although such restrictions protect patients from unqualified providers, they also tend to grant monopoly power to the medical profession. Physicians can use this monopolistic power to raise their fees.

These market distortions result in the fees for some specialties being higher than those for other specialties. A distorted fee schedule can cause an under- or oversupply of physicians by specialty and therefore also a lack of medical services in areas where there is an undersupply, excess service provision (which can be harmful to patients) in areas where there is an oversupply, and higher health expenditures when unnecessary services are rendered. To avoid distorted fees, policymakers in the United States and several other advanced economies have sought a systematic and rational foundation for determining physician fees.

Once a nation decides to move away from paying physicians according to their charges, the question becomes, "What rational foundation and methodology can be used to develop a relative value scale and set the conversion factor?" Equally important is the question of whether the medical profession will accept a new approach to administering their fees. The RBRVS was developed when the United States was grappling with these questions.

Theoretical Foundation

In 1979, William C. Hsiao and William B. Stason published an article that outlined a rational foundation for setting a physician fee schedule. It was to be based on the theory of competitive markets, whereby the price of a service would be equal to the cost of the input resources required to produce it efficiently. A fee schedule based on the price that a perfectly competitive market would yield has the advantage that the fees will allocate resources efficiently and services will be produced efficiently.

In 1986, the U.S. Congress requested and appropriated funds for developing a new method to set physician fees for the nation's Medicare program on a more rational basis. A Harvard University research group, headed by Hsiao, was selected from several competing organizations to conduct the study. Hsiao proposed to develop the new fees based on the principles of his earlier work. A year later, the U.S. Physician Payment Review Commission (PPRC), an advisory body to the U.S. Congress, also endorsed the method based on input resource costs. The commission reasoned that a resource-cost basis would reflect estimates of what relative values would be in a hypothetical market that functions perfectly and that in such a market, competition drives relative prices to reflect the relative costs of efficient producers.

Method and Data

The Harvard research group identified three main resource inputs required to produce physician services: (1) the total work input by the physician (TW); (2) the relative practice costs, including professional liability insurance premium (RPC); and (3) the amortized value of the opportunity costs of postgraduate specialty training (AST). These three components are combined to produce the RBRVS. Specifically, $RBRVS = (TW)(1 + RPC)(1 + AST)$. The TW, RPC, and AST are each expressed as an index. The total work is divided into pre-, intra-, and postservice work. The intraservice period is the time when a physician sees the patient or performs a procedure, while the preservice and postservice periods represent the time spent on the patient before and after the intraservice period.

To investigate the work and other costs, the RBRVS study relied on the Physician's Current Procedural Terminology (CPT-4), a coding system designed by physicians, to identify more than 7,000 distinct services, visits, and procedures.

In their study, the Harvard research group found that physician work consists of two key components: time and intensity of time. The intensity has four dimensions: mental effort and clinical judgment, technical skill, physical effort, and stress due to risk. The study employed the magnitude estimation method to measure work inputs for a given service. Magnitude estimation method is a way of measuring subjective perceptions and judgments;

its usefulness in obtaining reliable, reproducible, and valid results for work input has been repeatedly demonstrated.

The Harvard research group randomly selected 6,841 physicians from the American Medical Association's Physician Masterfile and surveyed them by telephone. They were asked to estimate the time and intensity of the work of selected services performed by that specialty. The survey covered 33 specialties. The overall response rate was 69%, ranging from a high of 84% for nuclear medicine to a low of 56% for obstetrics and gynecology. The responses were tested for reliability, consistency, and validity with different statistical methods such as the intraclass correlation method and regression analysis. The study found the results from the surveys to be reliable, consistent, and reproducible. A panel of more than 200 practicing physicians who served as consultants to the study, representing the 33 specialties, then reviewed the results. The research group found that the results had face validity.

In the national survey, physicians in each specialty used a different service as a standard against which to rate the work of other services. To create a common scale for all specialties, the research group had to link the separate scales. They developed a method whereby their physician consultant panels identified pairs of services from different specialties that required approximately equal amounts of intraservice work. They connected each specialty to others by at least four of the pairs, creating a set of linkages. They then used a weighted-least-squares method to find the best-fit location for each link. A jackknife analysis of the residual sum of squares suggested that the choice of links was appropriate.

Practice costs can vary widely between different specialties and different services. Such costs would include compensation for supporting staff, office space, equipment, and supplies. The RBRVS study divided practice costs into direct and indirect costs. The identification of direct costs is straightforward—these are the resources used to render a service. In contrast, indirect costs consist of all the remaining costs; they are allocated based on commonly accepted allocation methods used in cost accounting, such as time or space occupied.

Physicians master their clinical judgment and skills through post-medical school residency training, which can range from 3 to 7 years depending

on specialty. To undertake residency training, the physicians forgo the compensation they could have earned as medical school graduates. This loss in earnings constitutes the opportunity cost of residency training. The RBRVS study developed an index of the opportunity costs for different specialties by calculating the opportunity costs for each specialty and amortizing these costs over their working lifetime.

Last, the three components of the RBRVS are combined into one index.

Epilogue

The RBRVS study was completed for all specialties in late 1991. On its completion, the U.S. Congress immediately passed a law to adopt its use for the nation's Medicare program by January 1, 1992. Many private insurance plans in the nation adopted it as well. Responsibility for updating the RBRVS was given to the American Medical Association (AMA). Subsequently, several other nations, including Australia and France, and private insurance plans in England also adopted the RBRVS method to set their physician fees.

William C. Hsiao

See also American Medical Association (AMA); Centers for Medicare and Medicaid Services (CMS); Healthcare Financial Management; Health Economics; Medicare; Pay-for-Performance; Payment Mechanisms; Supplier-Induced Demand

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Healthcare Financial Management Association (HFMA):

<http://www.hfma.org>

RICE, DOROTHY P.

Dorothy P. Rice is a noted health economist and statistician who developed and applied methodologies for estimating the cost of illness and directed the federal National Center for Health Statistics (NCHS).

Rice was born Dorothy Rebecca Pechman in Brooklyn, New York, in 1922. Her parents had immigrated from Poland about a decade before. She attended Brooklyn College for 2 years and then transferred to the University of Wisconsin, where she earned a bachelor's degree in economics in 1941.

Immediately after college, she began her career as a federal civil servant—as an assistant statistical clerk for the Railroad Retirement Board, and in 1942, she moved to the War Production Board. There, she met her future husband, John D. (Jim) Rice, whom she married in 1943 and remained married to until his death 62 years later. In 1946, she worked as a health economist for the U.S. Public Health Service on the Hill-Burton Act, which supported the post–World War II growth of hospitals. Thereafter, she had three children, Kenneth, Donald, and Thomas and was out of the labor force, raising them and volunteering for various nonprofit organizations, from 1949 to 1960.

Rice reentered the labor force in 1960 and joined the U.S. Public Health Service. There, she helped develop, refine, and apply a methodology

for estimating the cost of a human life. Called the "human capital method," it approximates the economic value of life by calculating the discounted value of future earnings. One of her innovations was developing and refining methods for imputing values for those not in the labor force, such as housewives. One purpose of calculating the value of a life was to estimate the aggregate cost of disease. Rice estimated the costs of cardiovascular disease and cancer (1965) and then the overall cost of illness in the United States (1966).

She became Chief of the Health Insurance Research Branch of the Social Security Administration (SSA) in 1965 and then Deputy Assistant Commissioner for Research and Statistics at SSA in 1972. During the early 1960s, much attention was being devoted to national health insurance. She analyzed data from a comprehensive survey of the aged and found that more than half of the citizens aged 65 and older did not have adequate health insurance. These data were used in developing proposals that resulted in the Medicare program.

In 1976, Rice was appointed the director of the National Center for Health Statistics (NCHS). NCHS is the leading national agency that oversees the collection, analysis, and dissemination of health data. Her stewardship lasted until 1982, when she retired from the federal government and moved to California.

In 1982, Rice was appointed as a professor in the Department of Social and Behavior Sciences in the School of Nursing and at the Institute for Health and Aging at the University of California, San Francisco (UCSF). At UCSF she revisited her work on estimating the cost of illnesses, applying it to injuries, aging, mental illness, and AIDS. She devoted considerable attention to the cost of smoking and contributed to the Tobacco Settlement of \$246 billion between the state attorneys general and the tobacco companies.

Rice's honors include election to the national Institute of Medicine (IOM); the American Public Health Association's Sedgwick Memorial Medal for Distinguished Service in Public Health; the Presidential Award for Leadership and Contributions to Health Services Research from the Association for Health Services Research (now AcademyHealth); and the Jack C. Massey Award for Achievement in Health and Related Sciences. She also holds an

honorary doctorate of science from the College of Medicine and Dentistry at New Jersey. Rice is the author of more than 250 articles, chapters, books, and monographs. In 1999, the University of California, San Francisco, established the Dorothy Pechman Rice Center for Health Economics.

Thomas Rice

See also Acute and Chronic Diseases; Cost of Healthcare; Health Economics; Hospitals; Medicare; National Center for Health Statistics (NCHS); Tobacco Use, Women's Health Issues

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a particular (typically negative) event or, more generally, to a magnitude that is a combination of the probability of a negative event and the magnitude of loss associated with the given event. The more likely the event is to occur and the more harsh and costly the results if the event occurs, the greater the overall risk.

Risk in Epidemiology and Biostatistics

In the context of epidemiology, the term *risk* refers to the probability that some event will occur within a particular time period. Typical events are death (mortality) or disease (morbidity) incidence. The fixed time period is essential for defining the probability. Related measures of risk per unit time are instead referred to as *rates*. In the area of biostatistics, risk also refers specifically to the probability of the occurrence of a particular event during a defined time period. Biostatistical analyses along with epidemiologic study designs have been used extensively to analyze risk in this sense. Estimation of risk can be done based on a random sample of the population for whom the status of the given event is defined during the given time period; the estimate is then simply the number who experience the event divided by the total. It is essential that the entire sample be at risk of the outcome event. For example, if the event is the incidence of some disease, the population at risk is the subset of the population that has been diagnosed with the disease. It is also essential that each individual in the population can be properly classified as either having the event or not having the event during the given time period. Statistical theory addressing estimation of probabilities of risk is based on the binomial distribution. Confidence intervals can be computed that reflect the variation in the estimate due to sampling, based on the sample size and the assumption of a random sample.

An area within biostatistics known as survival analysis addresses the problem of incomplete information, or censoring, in the estimation of risk. Right censoring occurs when an individual known to be at risk of the event for some time period is then lost to follow-up or when the individual's subsequent status is unknown for some reason. The latest time the individual is known to still be at risk, or has still had the event, is his or her right-censored time. Such persons are said to be at risk

RISK

Risk refers to the potential negative impact of some event or exposure. It can refer to the probability of

of the event until they are right-censored. Given a sample of right-censored observations at any time point, the subset that is still known to be at risk is called the risk set. The product-limit estimate, or Kaplan-Meier estimate, is a method of estimating the cumulative risk of an event at any time point, based on conditional probabilities within the risk set. The entire set of risk estimates for different time points is the estimated survival curve.

Often risk is studied in terms of an instantaneous rate per unit time, which is then applied to a time interval to compute a risk or probability. Specifically, the rate is the potential for change in a numerator quantity—in this case, event occurrence, or change from no event to an event—relative to change in a denominator quantity—in this case, time. Under the assumption of a constant rate across time, the rate can be estimated easily from a sample of observations with varying amounts of time at risk. For example, a study of disease incidence might record disease status across time for a sample of persons initially free of the disease, and the observed time at risk might vary. If time is measured in months, the total person-time for the study is the sum of the number of months observed at risk across all individuals in the study. The average rate is then the number of events divided by the total person time and will be the event rate per month. This estimate is also known as the average incidence density.

Risk Factors and Risk Markers

A factor demonstrated to be associated with the risk of a particular outcome is called a risk factor. Examples of risk factors include environmental exposure, personal behaviors or lifestyles, or inborn or inherited characteristics. A risk marker is something shown to be associated with a particular health outcome but not necessarily as a causal factor. A factor that does seem to cause the given health outcome is referred to as a determinant of the health outcome. A determinant that can potentially be altered with intervention is a modifiable risk factor.

Risk Ratio, Odds Ratio, and the Risk Difference

There are three statistical measures used to summarize the association between a binary exposure

or other factor and risk of a given outcome; these are the risk ratio, the odds ratio, and the risk difference. The risk ratio is the risk of the outcome in those who are exposed divided by the risk of the outcome in those who are not exposed. A risk ratio of 2.0, for example, suggests that the exposure doubles the probability of the outcome. Similarly, the odds ratio is the ratio of the odds of the outcome in those who are exposed relative to those who are not exposed, where *the odds* is defined as the risk probability divided by 1 minus the risk probability. The odds ratio has become popular with researchers because, unlike the risk ratio, it is not altered when the proportion with exposure or disease is fixed in the sample by design. Considering a two-by-two table that is a cross-tabulation of exposure by disease outcome, another way of stating this property is that the odds ratio remains constant if the marginals of the table are altered. In case-control studies of disease outcomes that are rare in the population, the estimated odds ratio from the sample provides a reasonable estimate of the risk ratio in the population.

The risk difference is the risk of the outcome in those who are exposed minus the risk of the outcome in those who are not exposed. This measure of association is preferred by some researchers because its interpretation is directly tied to the number in the population affected by the exposure. There are several more variations on the risk difference. The rate difference is a difference in rates, rather than risks tied to a particular time period, between the exposed and unexposed. The population risk difference is the risk in the entire population minus the risk in the unexposed population, which corresponds to the theoretical improvement in the population risk if the exposure were entirely eliminated. The attributable risk is the population risk difference divided by the risk of disease in the population, or the proportion of risk that could theoretically be eliminated if exposure in the population were eliminated. The attributable risk among the exposed is the risk difference divided by the risk of disease given exposure, or the proportion of risk within the exposed population that could theoretically be eliminated.

Use of Statistical Regression

Epidemiological study designs along with statistical regression modeling have been used extensively

to identify factors related to risk. Logistic regression and Poisson regression are both used to model risk of disease, or any other binary variable, as the outcome measure. Logistic regression assumes linear effects on the logarithm of the odds of the outcome and produces a simple estimate of the odds ratio, whereas Poisson regression assumes linear effects on the logarithm of the risk of the outcome and produces a simple estimate of the risk ratio. Multiple regression, either logistic or Poisson, is used to adjust for confounders as additional independent variables and obtain a more accurate estimate of association of a given factor with disease risk. Inclusion of interactions as independent variables can allow for the magnitude of association between a factor and the outcome to vary with other characteristics. Factors or exposures under study are concluded to be risk factors for the outcome if the model coefficients representing their effects are statistically significantly different from zero, typically using the criterion of Type I error rate equal to .05. A statistically significant association in this case means that there is less than a 5% probability that the observed association arises only due to the particular random sample and that there is really no association in the population.

The epidemiologic literature refers to the following criteria for deciding that something is a risk factor: strength of the association, as elaborated above; dose-response effect (more exposure is associated with higher risk); lack of temporal ambiguity (the risk factor precedes the outcome); consistency of findings across different studies; biological plausibility; coherence of evidence; and specificity of the association.

Risk Assessment

Risk assessment is the estimation of risk of adverse effects resulting from negative exposures to health hazards or from absence of beneficial or positive exposures. Specifically, the amount of risk is estimated in terms of a probability and in terms of different magnitudes or doses of exposure. In the context of negative environmental exposures, or ecological risk assessment, the process typically consists of four steps. The hazardous negative exposure, conditions of exposure, and the potential target population must be identified (hazard

identification), and the resulting adverse events to be investigated must be described (risk characterization). The exposure to the relevant population must then be quantified and measured (exposure assessment); this could be done based on measures of emissions or environmental levels of the toxic substance, reflecting potential exposure in a particular area, or directly from biological monitoring of subjects from a representative sample. The final step (risk estimation) consists of combining information to make a statement about expected health effects in the target population.

Health risk appraisal is a form of risk assessment that addresses individual behaviors or lifestyles that play the role of exposure. In this case, the purpose of the risk assessment would be to identify high-risk people and motivate them to change their negative exposures or behaviors. Promoting awareness of negative effects would hopefully create a tension in high-risk individuals. There is a vast literature addressing numerous intervention programs designed to motivate change in high-risk behaviors.

The process of taking steps to reduce levels of risk is called risk management. Typically, this refers to an active hazard and control process to deal with environmental agents of disease such as toxic substances. There are three steps involved in risk management: risk evaluation, exposure control, and risk monitoring. Specifically, *risk evaluation* refers to the determination of acceptable versus unacceptable risk by comparing risk estimates with some standard for level of acceptable risk. *Exposure control* refers to actions taken to keep exposure below the acceptable maximum level. *Risk monitoring* is the process of measuring reduction in the risk as a result of exposure control.

Risk-benefit analysis refers to the process of analyzing and comparing the benefits, or expected positive outcomes, with the costs, or expected negative outcomes, of a particular action. When this is done on a single scale, results can be summarized as a risk-benefit ratio, defined as the ratio of risks to benefits. For example, the single measurement scale could be dollars.

In the context of economics, financial risk is often defined as the unexpected variability of returns, including both worse than expected and better than expected outcomes. In this case, the process of assessing risk involves predicting the

range or variability of possible outcomes of a given action.

Sally A. Freels

See also Disease; Epidemiology; Infectious Diseases; Mental Health Epidemiology; Morbidity; Mortality; Mortality, Major Causes in the United States; Public Health

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- National Institute of Mental Health (NIMH): <http://www.nimh.nih.gov>
- Risk World: <http://www.riskworld.com>
- Toxicology Excellence for Risk Assessment (TERA): <http://www.tera.org>

ROBERT WOOD JOHNSON FOUNDATION (RWJF)

Located in Princeton, New Jersey, the Robert Wood Johnson Foundation (RWJF) is the largest U.S. foundation exclusively funding health-related activities and research. It played a major role in creating the new field of health services research, and because of its large size and the number of

projects it funds, the foundation continues to have an important impact on the field.

Robert Wood Johnson II (1893–1968), who built the family firm of Johnson & Johnson into one of the world's largest health and personal-care products entities, established the foundation in 1936. On his death, he left the vast majority of his personal fortune to the foundation. Since that time, the RWJF has funded research, education, and services in a wide variety of areas but with the priorities of access to affordable primary care, medical and nursing education, and quality-of-care initiatives. The foundation does not fund direct care or biomedical research. Hospitals, universities, public schools, professional associations, research organizations, community groups, and state and local governments are eligible for funding.

In 2006, the RWJF awarded over 900 grants and contracts totaling \$403 million. Grants from the foundation average \$300,000 for a project period of 3 years. Many types of organizations have been funded; priority is given to public agencies, public charities, and organizations deemed tax-exempt under Section 501(c)(3) of the U.S. Internal Revenue Code. Only projects located in the United States are funded; no international projects are supported. Many types of projects are funded, including service demonstrations, surveillance, data collection and analysis, secondary data analysis, public education (including health professions training programs), policy development and analysis, health services and public health services research, technical assistance, communication activities, and evaluation projects.

Background

In 1952, the foundation, which was originally located in New Brunswick, New Jersey, and called the Johnson New Brunswick Foundation, moved to Princeton, New Jersey, and changed its name to the Robert Wood Johnson Foundation. At this time, it also expanded its scope and began funding projects throughout New Jersey; previously it only funded local projects in New Brunswick.

In its early decades, the Johnson Foundation developed a set of priorities that still guide its funding: hospitals and healthcare; scholarship support, primarily in the health professions; and community service programs focusing on vulnerable

and underserved populations. In its early years, over half of all its grant funds went to support hospitals and healthcare, primarily in New Brunswick. It also established a large number of educational scholarships for medical, dental, nursing, and pharmaceutical students from low-income backgrounds; approximately 25% of its funds were spent in this area. The remainder of the foundation's spending was directed to community agencies serving indigent people, particularly youth. This included secular organizations such as the Boy Scouts and Girl Scouts as well as religion-affiliated organizations such as the Hillel Foundation and the Christ Church of New Brunswick.

In 1968, when Robert Wood Johnson II died, the foundation had a net worth of over \$53 million. In his will, he bequeathed \$300 million in Johnson & Johnson stock to the foundation. In the 3 years it took to probate his estate, the value of the stock increased to more than \$1 billion. This radically changed the foundation, making it the largest health-focused philanthropy in the nation. In 1971, the foundation's policy committee decided that the foundation's grants would have a national focus and that its primary purpose would be to contribute to the advancement of healthcare in the United States. Three specific objectives were adopted: expand access to medical care services for underserved populations through large-scale testing of promising approaches; improve the quality of medical care through measures including funding health professions training programs, especially those designed to increase minority representation in the primary-care disciplines; and develop approaches designed to allow the objective analysis of health-related public policies. Broadly speaking, the RWJF has kept this focus while continuing to maintain a more diverse giving strategy in the New Brunswick, New Jersey, area.

In 1971, the foundation had \$1.2 billion in assets, and in the next funding year, it dispersed \$45 million; this compares with a total of \$4.4 million in giving during the previous 34 years. Faced with the responsibility of managing this large grant program, the foundation leadership set several priorities for giving. They decided that the foundation would provide seed money to test new programs and ideas, especially in the areas of access to care for underserved populations, improving the quality of health and medical care, and developing methodologies

that would lead to objective analysis of policy interventions. They also decided to fund outcomes over process, positioning the foundation to be an early leader in the area of program evaluation. Finally, they committed the foundation to devoting significant resources to communication, thereby ensuring that their findings would be well-known and available to researchers, academic leaders, elected officials, and government policymakers.

Many of these basic approaches and areas of interest have stood the test of time. The RWJF continues to fund communications and evaluations, health professions training, and testing of new ideas through large demonstration projects. Specific issues and strategies have changed over time and will continue to evolve as the health-related needs of the nation change and develop.

Current Priorities

Specific information regarding the foundation's current funding priorities is available on its Web site. Funding is available through specific calls for proposals (CFPs); unsolicited proposals are rarely accepted except in three program areas: human capital, vulnerable populations, and pioneer projects. Proposals can include funding for service demonstrations, gathering and monitoring of health statistics, public education, health professions training and fellowship programs, policy analysis, health services and public health services research, technical assistance, communications activities, and evaluation activities. The foundation does not fund general operating expenses, existing deficits, endowment or capital campaigns, biomedical research, research on drug therapies or devices, direct support of individuals, or any kind of lobbying activities. As of 2008, the foundation no longer accepts proposals related to long-term care, end-of-life care, physical activity for adults over 50, and specific chronic conditions not otherwise covered in their priority areas.

Affordable Primary Care, Access to Care, and Health Professions Education

The giving practices of the RWJF show that it views these three issues as intertwined. From its earliest days, the foundation sponsored programs to expand health insurance and access to care, to

explore the efficacy of prepaid group plans, and to promote primary care. Between 1972 and 1975, the foundation provided over \$50 million to academic medical centers to improve the delivery of primary care and to train health professionals in the primary-care disciplines. The Clinical Scholars Program was also initiated during this time. During the mid-1970s, the foundation funded a demonstration project to improve dental care for disabled persons, a project that permanently changed the standard-of-care and service delivery approach for this population. In the late 1990s, the foundation targeted efforts toward health insurance coverage for children. In 1997, it launched Covering Kids and Families at a cost of \$13 million. A month later, the U.S. Congress passed the \$20 billion State Children's Health Insurance Program (SCHIP). The foundation added \$34 million to help states enroll children in the program.

This area of grant making is driven by CFPs issued by the foundation; unsolicited proposals are not accepted. In 2006, a wide variety of projects received funding, including 47 proposals totaling \$19.6 million designed to address affordable healthcare coverage through the development of policies and programs to expand healthcare coverage and maximize enrollment in existing coverage programs.

Quality Initiatives

During the 1970s, the foundation funded Georgetown University to develop a methodological tool to measure the quality of diagnostic services and follow-up care. Since that time, the foundation's interest in this area has broadened. In 2006, 133 grants totaling \$43.1 million were awarded. Many projects are designed to assist communities—especially communities facing lower standards of care—to improve the quality of healthcare in ways that matter to their residents. These efforts take a variety of approaches, including coalition building, developing performance measures, and encouraging public disclosure of healthcare quality measures and quality improvement projects. Program and policy evaluation are also funded under the foundation's quality initiative. The foundation also uses its national resources to ensure that results are effectively communicated to all stakeholders.

Health Services Research and Public Policy

Historically, the foundation's commitment to health services research has been embedded in its commitment to evidence-based public policy. In the 1990s, the foundation became interested in understanding and accessing the changes wrought by managed care in terms of access, cost, and quality. To facilitate this interest, the foundation established a new organization, the Center for Studying Health System Change. This organization, located in Washington, D.C., continues to design and conduct research on the nation's healthcare system to inform policymakers in government and private industry.

During the 2001 decade, the RWJF increased its efforts in this area, coming forward and espousing a need to refocus the national health services research agenda to include public health services and systems research. It is the intent of the foundation to direct more private and public dollars towards building a strong public health research infrastructure, one that continues to generate epidemiological data as well as address the social and community conditions that promote physical and mental health in the population. In announcing its increased interest in this area of research, the foundation expressed concern over the fragility of the nation's public health system and stated that, in its estimation, the best remedy is to increase the science base and ensure that recommendations are based on findings, not political expediency. While in terms of grant-making dollars this is a new initiative, it is consistent with the foundation's longstanding interests and builds on its activities to support the 1988 National Academy of Sciences, Institute of Medicine (IOM) report, *The Future of Public Health*, participation in the Turning Point Initiative, and the goals and objectives of Healthy People 2010.

Funding under this giving area is in response to specific CFPs issued by the foundation. In 2006, 137 projects were funded, totaling \$43 million. Most of these projects were designed to improve the performance of public health agencies, increase advocacy for public health resources and policy changes, and, to these ends, build an evidence base for public health policy and practice. Funding to build the evidence base included assessing the potential of a public health accreditation system

and other quality improvement efforts; projects that actively engage public health research partners; support for survey research concerning public health activities; and research to assess the potential health impacts of a variety of projects and policies.

Of note, the National Association of City and County Health Officials (NACCHO) and the Association of State and Territorial Health Officials (ASTHO) were among the public health organizations funded to create a national public health accreditation system to serve as the basis for ongoing quality assessment, greater transparency, and increased accountability.

A variety of advocacy initiatives were also funded in 2006. They included tobacco control measures, including smoke-free-air laws and tobacco taxes.

Healthy Communities and Lifestyles

Beginning in the 1990s, the RWJF became interested in the nonmedical factors that influence health. Since that time, it has funded many approaches to ensuring healthy communities and to encouraging healthy lifestyle choices. Projects have been funded on a broad array of topics, including smoking, diet, sexual behavior, substance abuse, and environmental exposures. Beginning in 2006, the foundation specifically directed efforts toward the childhood obesity epidemic in the belief that the long-term consequences of childhood obesity will negatively affect the health status of an entire generation and will further stress systems of primary care and limit resources. In that year, 128 grants totaling \$41.8 million were funded to support the priority of reversing the epidemic by 2015 by improving access to affordable healthy foods and increasing opportunities for physical activity in schools and communities across the nation. Three integrated strategies guide this area of grant making. The foundation prioritized funding projects that will build an evidence base to ensure that the most promising efforts are replicated throughout the nation. It also funds action strategies for schools and communities, including coalition building to disseminate promising approaches at the local level. Advocacy efforts also receive funding under this initiative.

The foundation funds the Leadership for Healthy Communication initiative, which works with national organizations that represent elected and appointed officials—such as the National Conference of State Legislatures and the U.S. Conference of Mayors—to educate their members about successful approaches to increasing physical activity and healthy eating among children and young adults.

In 2008, the foundation announced a new initiative in this area, the Commission to Build a Healthier America. This commission, funded for 2 years, is charged with identifying proven interventions capable of successful replication, especially those interventions that take into account economic, social, and physical environment factors. This program area accepts unsolicited proposals.

Vulnerable Populations

This area of giving is designed to support promising ideas and strategies to overcome health disparities. Unsolicited proposals are accepted. In 2006, 154 grants totaling \$83.7 million were approved. This area of giving supports promising new ideas to help overcome long-standing health challenges for groups that bear an excess of the burden of disease. Projects often address poor health status in the context of other factors such as housing, education, and poverty. Changes in healthcare service delivery and organization are funded, as are initiatives to improve policy, financing, and service integration among local service providers and state and federal agencies. The Community Oriented Correctional Health Services project funds continuity-of-care approaches to connect the healthcare provided in local correctional centers with healthcare providers in the community.

This giving area also funds projects that bring together nontraditional partners and multiple-service systems to address health disparities and care for vulnerable populations. As an example, the Green House Project is taking a new approach to skilled-nursing homes and assisted living facilities by creating residences for small groups of individuals who require skilled nursing care in a homelike setting.

The foundation also funds projects to address rapid demographic changes occurring in the nation,

including the Community Partnership for Older Adults and the New Routes to Community Health projects.

Human Capital

This giving area funds a wide variety of training programs and leadership development programs. In 2006, 195 grants totaling \$115.1 million were awarded. Unsolicited proposals are accepted. This area includes some of the foundation's most long-standing programs, such as the Clinical Scholars Program. It also funds programs to increase the racial and ethnic diversity of the health professions, train people in specific subdisciplines such as quality improvement, ameliorate the nursing shortage, and involve scholars from a variety of fields (e.g., business, engineering, and law) in research studies on the policy issues in health and health-care. Diversity training and cultural-competence projects are also funded. The foundation maintains many midcareer awards, including its Health Policy Fellowship Program, Community Health Leaders Program, and the Executive Nurse Fellows Program.

Pioneering Projects

This area of giving allows the foundation to be an early participant in new approaches to important problems, approaches deemed capable of developing breakthrough improvements in health, healthcare, and public health. The foundation tends to fund projects that it feels have the potential to become long-term foundation initiatives. Unsolicited proposals are accepted. In 2006, 29 grants totaling \$8.3 million were made in this area. This included funding for new approaches to fighting drug-resistant diseases; improving the public health system's ability to predict influenza outbreaks; a national program to reform medical liability by developing a system of specialized health courts; the Myelin Repair Foundation, to develop a fast-track process for "bench to bedside" translational research; and Project Health Design, which is designing strategies to expand the use of personal health records and develop a "smart" system capable of helping individuals comply with treatment guidelines and engage in preventive measures.

Science Evaluation

Beginning in the 1970s, the foundation became committed to program evaluation. It has consistently funded evaluation components for its projects. Over the years, the foundation has remained interested in program evaluation, outcome evaluation, and the evaluation of specific policy initiatives. Funding for evaluation is embedded in all successful grant proposals. However, specific evaluation projects are also funded.

Impact on Health Services Research

The RWJF's commitment to health services research has been consistent throughout its history. It has supported research, evaluation, and the dissemination of results toward the end of supporting an evidence-based approach to the development and evaluation of public policy. Health services research is a major focus of the foundation; this is clearly evident in its rhetoric, its requests for proposals, and the allocation of its grant funds. In many ways, its support of other issues such as building healthy communities, supporting health professions education, and addressing discrete issues such as childhood obesity is toward the end of evidence-based public policy. The foundation will likely continue to play a dominant role in the funding of the field of health services research in the future.

Judith V. Sayad

See also Access to Healthcare; Center for Studying Health System Change; Health Insurance; Primary Care; Public Policy; Quality of Healthcare; State Children's Health Insurance Program (SCHIP); Vulnerable Populations

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<http://www.rwjf.org>

ROEMER, MILTON I.

Milton I. Roemer (1916–2001) was a pioneer in health services research, a health administrator, and a teacher. Roemer was a scholar in the areas of international health, primary care, rural health, and healthcare organization. He was the first to identify, in the early 1960s, the phenomenon of supplier-induced demand. Specifically, he found that when health insurance is widespread in a community, increased utilization of services results in an increase in the supply of hospital beds, or, in short, a hospital bed built is a bed filled. This finding became known as the *Roemer effect* or *Roemer's law*. It would contribute in the 1970s to the enactment of federal certificate-of-need (CON) legislation and comprehensive health planning.

Born in Paterson, New Jersey, in 1916, Roemer earned a master's degree in sociology from Cornell University in 1939, a medical degree from

New York University in 1940, and a master's degree in public health from the University of Michigan in 1943.

In the early 1940s, Roemer was a county health officer for Monongalia County, West Virginia. Later, he was a medical officer for the New Jersey State Health Department. During World War II, he joined the U.S. Public Health Service, where he served as a medical officer for the War Food Administration and the Medical Care Administration of the States Relations Division. In 1951, Roemer began his international work when he was appointed Chief of Social and Occupational Health at the newly formed World Health Organization (WHO). At the WHO, he was responsible for a wide range of services, including hospital administration, occupational health, and the organization of medical care, among others. However, he was forced out of his position when the U.S. government withdrew its approval of his appointment under pressure of McCarthyism. In 1953, Roemer moved to Canada, where he worked for the Saskatchewan Department of Public Health as the Director of Medical and Hospital Services. He eventually returned to the United States and taught at Yale and Cornell universities. In 1962, Roemer joined the faculty of the School of Public Health at the University of California, Los Angeles (UCLA). He taught courses in comparative national health systems, hospital administration, medical care, and public health. And he served as the chairman of the Department of Health Services for 8 years. While at the university, he undertook extensive work in Asia and Latin America. In 1986, Roemer retired from the university and became Professor Emeritus.

During his 60-year career, Roemer conducted a wide range of research projects in international health, and he was a prolific writer. He worked in 71 countries and authored or coauthored 32 books and 430 scholarly articles. One of his best-known publications is *National Health Systems of the World*, a monumental two-volume comparative analysis of international healthcare systems.

Roemer received many awards and honors in recognition of his work. He was a member of the National Academy of Sciences, Institute of Medicine (IOM). He received the International Award for Excellence in Promoting and Protecting the Health of People in 1977, the Sedgwick Memorial Medal for distinguished service in public health in 1983,

and the Lifetime Achievement Award in 1997 from the American Public Health Association (APHA). He also received the Joseph W. Mountain award from the Centers for Disease Control and Prevention (CDC) in 1992 and the Distinguished Career Award from the Association for Health Services Research in 1997. Roemer died in 2001 at the age of 84.

Ross M. Mullner

See also Certificate of Need (CON); Comparing Health Systems; Health Planning; International Health Systems; National Health Insurance; Public Health; Public Policy; Supplier-Induced Demand

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ROOS, LESLIE L.

Leslie L. Roos is a Distinguished Professor at the University of Manitoba (Canada), the founding

director of the Population Health Research Data Repository, and Senior Researcher at the Manitoba Centre for Health Policy. Roos is a recognized expert in the use of administrative databases in conducting health services research.

Roos received a bachelor's degree with honors in psychology and biology from Stanford University in 1962. With awards from the National Science Foundation and Social Science Research Council, he earned a doctoral degree in political science from the Massachusetts Institute of Technology (MIT) in 1966. He then completed a postdoctoral fellowship in political science at MIT. Following academic appointments at Brandeis and Northwestern Universities, in 1973, Roos joined the University of Manitoba as an associate and was subsequently full professor in the Faculty of Administrative Studies (now the Asper School of Business). His early research resulted in three books and numerous papers on social science methods and organizational behavior. Roos moved to the University of Manitoba's Department of Community Health Sciences, Faculty of Medicine in 1990.

Roos's substantive work includes a number of papers comparing health and healthcare in Canada and the United States, looking at primary and secondary prevention among socioeconomic groups over time, and analyzing alternative approaches to funding Canadian Medicare. Roos's studies have helped transform research approaches in health services, health policy, and population health. Recent papers are expanding the applicability of his work in epidemiology, economics, and sociology. Current research has been examining the effects of family and place on well-being.

Roos has received over \$20 million in research support (several grants have been in collaboration with researchers based across Canada as well as at several U.S. universities), and he has been invited to venues as diverse as Australia and Spain to give short courses on his work.

Roos's contributions in health services research have been recognized nationally and internationally and through the ongoing success of the Manitoba Centre for Health Policy. He has published approximately 186 peer-reviewed papers and book chapters with collaborators from leading universities. Roos has been honored as a "Highly Cited Investigator" by the Institute of Scientific Information. His citations recently tallied almost

2,800, the highest number of citations by any Canadian social scientist. Journals in which he has published include *Health Affairs*, *Health Services Research*, *Journal of Clinical Epidemiology*, *Journal of the American Medical Association*, *Medical Care*, *Milbank Quarterly*, *New England Journal of Medicine*, and *Social Science and Medicine*.

Roos received career funding from the National Health Research and Development Program for over 20 years. He is a fellow of AcademyHealth and an associate of the Canadian Institute for Advanced Research. His work contributed substantially to the Manitoba Centre for Health Policy's receipt of the 2001 Health Services Research Advancement Award from the Canadian Health Services Research Foundation (CHSRF) and the 2005 regional Knowledge Translation award from the Canadian Institutes for Health Research.

Roos has received awards from the University of Manitoba for research excellence, outreach, and graduate student mentorship.

Gregory S. Finlayson

See also Canadian Association for Health Services and Policy Research (CAHSPR); Canadian Health Services Research Foundation (CHSRF); Data Sources in Conducting Health Services Research; Health Services Research in Canada; Roos, Noralou P.

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http://www.nber.org/cgi-bin/author_papers.pl?author=leslie_roos
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- Studying Health and Health Care:
<http://www.pitt.edu/~super1/lecture/lec1011/index.htm>
- Studying Health Care: Some ICD-10 Tools:
<http://www.pitt.edu/~super1/lecture/lec22371/index.htm>
- Working More Productively: Tools for Information-Rich Environments: <http://www.pitt.edu/~super1/lecture/lec11441/index.htm>

ROOS, NORALOU P.

Noralou P. Roos is a professor at the University of Manitoba (Canada) and the founding director of the Manitoba Centre for Health Policy, where she is a senior researcher, having stepped down from the directorship in 2004. Her research interests include the use of administrative data for managing the healthcare system; the relationship between healthcare use and population health; and, most recently, the impact of early childhood experiences, education, community environment, and healthcare interventions on the health of children.

Roos received a bachelor's degree with distinction and departmental honors in political science from Stanford University in 1963. As a Woodrow Wilson Fellow and a Woodrow Wilson Dissertation Fellow, she earned a doctoral degree in political science from the Massachusetts Institute of Technology (MIT) in 1968. Her first academic appointment was in political science at MIT. She then moved to a faculty position in the Graduate School of Management at Northwestern University,

followed by a year as a medical program specialist and Sears-Roebuck Foundation Federal Faculty Fellow at the National Center for Health Services Research Development. In 1973, Roos joined the University of Manitoba as an associate and subsequently full professor in the Faculty of Administrative Studies (now the Asper School of Business) (1973–1988) and the Faculty of Medicine (1973 to present).

As founder of the Manitoba Centre for Health Policy and Evaluation (later called the Manitoba Centre for Health Policy), Roos established a prototype for successfully conducting research using administrative data. The Centre holds anonymized and linkable health administrative data for all health services provided within the province of Manitoba. Using these data, Roos and her colleagues have addressed many important questions about the health and healthcare of Manitobans, and their findings have been valuable not only in Manitoba but in other healthcare systems in Canada and elsewhere around the world.

Roos is an Institute for Scientific Information Highly Cited Researcher, placed in the top half of 1% of published scientists with over 2,800 citations. Her early work built on her doctoral research and focused on public administration in Turkey. Subsequently, she shifted her scholarship to evaluation and to evaluating health programs in particular. She has published over 200 scholarly articles and academic reports and has collaborated extensively with authors throughout North America and elsewhere in the world. She has published in journals such as *American Journal of Public Health*, *Health Affairs*, *Health Services Research*, *Medical Care*, *Milbank Quarterly*, the *New England Journal of Medicine*, and *Social Science and Medicine*.

Over the course of her career, Roos has received over \$45 million in research support, including being continuously funded as a National Health Research Scientist from 1973 to 1998, an associate with the Canadian Institute for Advanced Research from 1988 to 2002, and a Tier 1 Canada Research Chair in Population Health Research from 2001 to the present. She was a member of the Prime Minister's National Health Forum from 1994 to 1997 and a member of the Medical Research Council from 1997 to 2000.

Her work and collaborations were recognized in 2001 through the Canadian Health Services Research Foundation (CHSRF) awarding the Manitoba Centre for Health Policy the Health Services Research Achievement Award. In 2005, Roos was the recipient of the Order of Canada in recognition of her lifetime of outstanding achievement, dedication to the community, and service to the nation.

Gregory S. Finlayson

See also Canadian Association for Health Services and Policy Research (CAHSPR); Canadian Health Services Research Foundation (CHSRF); Data Sources in Conducting Health Services Research; Health Services Research in Canada; Roos, Leslie L.

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ROEM, C. RUFUS

The field of health economics was still in its infancy when C. Rufus Roem (1894–1988) was asked to join the landmark Committee on the Costs of Medical Care (CCMC) in 1929. From that time onward, Roem’s groundbreaking work established his reputation as a pioneer in this new field. Along the way, Roem proved to be an innovative and influential advocate for group medical practice, hospital prepayment, uniform hospital accounting, and areawide health planning.

Born in Radcliffe, Iowa, in 1894, Roem was the son of Norwegian immigrant parents who were members of the Religious Society of Friends, or Quakers. Roem attended Oberlin College, majoring in political science. After graduation, he accepted a position with the Goodyear Tire and Rubber Company. But he soon left to join the U.S. Army for service in World War I. After the war, Roem decided to pursue a career in education, and he took a position teaching accounting and business courses at Earlham College, a small Quaker college in Richmond, Indiana. To establish his credentials in accounting, he passed the Indiana Certified Public Account (CPA) examination. At that time, Roem saw where his future lay, for he enrolled in graduate studies at the University of Chicago. He received an instructorship in accounting, and he completed a master’s and a doctoral degree in economics. Soon Roem was promoted to assistant professor at the university, and in 1928 was appointed assistant dean of its School of Commerce and Administration. And in 1929, he became an associate professor.

While at the University of Chicago, Roem developed a friendship with a colleague who had a lasting influence on his life. In 1928, he met Michael M. Davis. Davis was a major figure in the nation’s medical-care circles; he was the director of medical services at the Julius Rosenwald Fund and an executive committee member of the CCMC. The CCMC was organized in 1927 and supported by a number of large foundations to conduct a 5-year study of the financing and delivery of medical care in the nation.

In 1929, Davis asked Roem to become the associate director of medical services at the Rosenwald Fund. He also asked Roem to lead a study of hospital capital investment for the CCMC,

which had not been studied previously. The project appealed to Roem because of his background and his interest in public finance and nonprofit corporations. It was not long before Roem was a full-time staff economist for the CCMC. In 1930, he moved to Washington, D.C., where he assisted in preparing a number of CCMC reports, including the landmark *Final Report of the Committee on the Costs of Medical Care*, which was published in 1932.

While at the University of Chicago, Roem also met Isidore S. Falk. Falk would become widely recognized in medical-care circles for his work on health and Social Security issues. Eventually, Falk became the associate director of the CCMC research staff, linking him professionally with both Roem and Davis.

Roem’s work at CCMC led to his interest in the prepayment of healthcare. He became associate secretary of the American Hospital Association (AHA) and later, executive secretary of the Committee on Hospital Service, where he assisted in the approval of prepaid group hospitalization in 1934. It has been said that Roem more than anyone else shaped the movement of prepaid healthcare. Ultimately, Roem’s activities at the AHA helped enormously in laying the foundation for the formation of Blue Cross and Blue Shield plans around the nation. In his work, Roem was influenced by E. A. Filene’s emphasis on applying the principles of scientific management to the healthcare field and by his advocacy for group prepayment and regional health planning.

In 1946, Roem testified before the U.S. Senate Committee on Education and Labor, describing the rapid growth of Blue Cross plans in America as having “enrolled more participants in less time than any voluntary movement in the history of the world.”

Among the principles Roem supported were not-for-profit operation in healthcare, appointing physicians and community leaders to hospital governing boards, patients’ choice of physician and hospital, financial integrity, and “dignified promotion.” He believed strongly that health is wealth and access to health services is a basic right, essential to the effective pursuit of happiness. He also held the opinion that while healthcare is an economic commodity, it differs sharply from other commodities.

Rorem was a prolific writer. His first publication on medical care costs was *The Public's Investment in Hospitals* (1930). In the book, he underscored the fact that most hospital capital came from public rather than from private sources. He also published *Private Group Clinics* (1931). Rorem contributed to 5 of the 28 reports issued by the CCMC, and he was the author of numerous other publications.

Rorem remained at the American Hospital Association for 10 years, leaving in 1947 to take the position of executive director of the Hospital Council of Greater Philadelphia. He remained there until 1960, when he took a post in Pittsburgh as the director of the Hospital Planning Association of Alleghany County.

During his long career, C. Rufus Rorem received many honors, including membership in the Health Care Hall of Fame. He was admired for his soft-spoken and self-effacing manner and respected for his view of healthcare as more than just a business. He had no sympathy for the view of many hospital spokesmen and physicians who described their activities as an "industry." He was a gentle and wise man who made an indelible mark on American health economics and medical care.

Samuel Levey and James Hill

See also American Hospital Association (AHA); Blue Cross and Blue Shield; Committee on the Costs of Medical Care (CCMC); Davis, Michael M. ; Health Economics; Hospitals; Medical Group Practice

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ROSENBAUM, SARA

Sara Rosenbaum is a leading health policy expert whose professional accomplishments have transformed the lives of ordinary Americans by advocating for more equitable and effective policies to increase access to healthcare for low-income, minority, and medically underserved populations. Rosenbaum has been pivotally involved in designing national and state legislative and regulatory health policies in a variety of areas, including Medicaid, private health insurance, employee health benefits, health services for medically underserved populations, maternal and child health, civil rights, and public health.

Sara Rosenbaum is the Harold and Jane Hirsh Professor of Health Law and Policy and is the founding chair of the Department of Health Policy at the George Washington University School of Public Health and Health Services in Washington, D.C. She is also the director of the Hirsh Health Law and Policy Program and the Center for Health Services Research and Policy at the university.

Rosenbaum received her bachelor's degree from Wesleyan University in 1973 and her Juris Doctorate degree from the Boston University School of Law in 1976. She began her career as a community legal services attorney in Vermont and California and also worked at the Children's Defense Fund in Washington, D.C.

Rosenbaum's research interest focuses on the ways in which the law intersects with the nation's healthcare and public health systems, with a

particular interest in quality of care, managed care, insurance coverage, and civil rights. She has published extensively and is coauthor of the widely used health law textbook *Law and the American Health Care System*.

Rosenbaum serves on many boards and committees, including AcademyHealth, the National Board of Medical Examiners, and the Committee on Child Health Research of the American Academy of Pediatrics and on study committees of the national Institute of Medicine (IOM), and she serves in an advisory role to the March of Dimes and the Centers for Disease Control and Prevention's (CDC) National Center on Birth Defects and Disabilities. During the Clinton administration, from 1993 to 1994, Rosenbaum worked for the White House Domestic Policy Council, where she directed the drafting of the Health Security Act and oversaw the development of the Vaccines for Children program.

Rosenbaum has received numerous accolades for her work, including the Investigator Award in Health Policy from the Robert Wood Johnson Foundation, and has been recognized by the U.S. Department of Health and Human Services for distinguished national service on behalf of Medicaid beneficiaries. In addition, she has been named one of the nation's 500 most influential health policy-makers by McGraw-Hill.

Rosenbaum has advised the U.S. District Court for the Middle District of Tennessee in *John B. v. Groetz*, a class action suit that challenges the adequacy of health services for children in that state. She also continues to champion the needs of the most marginalized members of our society and mentors students interested in improving health-care for the poor.

Jared Lane K. Maeda

See also Access to Healthcare; Medicaid; Public Health; Public Policy; Regulation; State Children's Health Insurance Program (SCHIP); Uninsured Individuals; Vulnerable Populations

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RTI INTERNATIONAL

RTI International is an independent, nonprofit research organization dedicated to improving the human condition by turning knowledge into practice through cutting-edge study and analysis in health and pharmaceuticals, education and training, surveys and statistics, advanced technology, democratic governance, economic and social development, energy, and the environment. Founded in 1958 by three universities (Duke University, North Carolina State University, and the University of North Carolina) in North Carolina's Research Triangle Park, RTI was the initial research organization and focal point for research in the Park; its first projects included applied statistics and environmental research. Today, with a staff of more than 2,600 individuals, RTI conducts research in 40 countries. Headquartered in North Carolina, RTI has seven U.S. regional offices and eight international offices. Its clients include most federal cabinet departments (particularly the U.S. Department of Health and Human Services), numerous state and public health agencies, and a variety of private foundations.

Health Services Research

Health services research encompasses investigations into healthcare delivery and interventions from prevention and screening through diagnosis and treatment to rehabilitation; a broad set of health policy issues concerning access to care, costs of care, and quality of care; health insurance; effectiveness and efficiency of care processes; patient outcomes, including quality of life and satisfaction; workforce issues; and a wide array of social problems with health implications, including domestic violence and criminal justice, substance use and abuse, and environmental toxicities. Health services research at RTI concerns individuals, families, organizations and institutions, communities, and populations.

RTI's research portfolio is highly multidisciplinary and applies sophisticated quantitative and qualitative methods from many fields, including social sciences such as sociology, psychology, anthropology; statistical, economic, and mathematical sciences including advanced modeling techniques; epidemiologic and public health fields that employ community-based methods; and biological and life sciences, particularly medicine, nursing, and pharmacy. RTI projects employ advanced survey techniques based on both traditional and modern measurement theory, all possible administration modes, and program evaluation and policy analysis.

Exceptionally strong survey and computer processing capabilities support health services research at RTI. Healthcare surveys may be small area, national, or international in scope, and they may be either cross-sectional or longitudinal in nature. RTI specializes in recruiting and following hard-to-reach populations, such as children in the foster care system, the low-income elderly, and homeless persons. RTI has an outstanding capacity for using administrative data, with programmers able to link claims and enrollment data from multiple sources to create episodes of care or to follow cohorts of patients over time.

Principal Areas of Research

RTI research is heavily oriented toward improving the health and well-being of individuals and populations (both domestically and internationally),

enhancing healthcare and social programs, and strengthening public policy through an extensive health services research and policy analysis portfolio. Particular emphasis is placed on applying multiple disciplines, methods, and theoretical frameworks to healthcare financing and payment; healthcare quality; aging and persons with disabilities; child, adolescent, and family well-being; early childhood development; women's and reproductive health; and health and social organizations. RTI conducts research on substance abuse, mental health, and criminal justice issues using a wide range of multidisciplinary social science methods on broad topics of behavioral health and related policy issues. Research foci include substance abuse prevention and treatment; HIV/AIDS; problems of the urban poor; risk behaviors and family research; and transdisciplinary research that links genetic, neurobiological, and behavioral factors in the study of substance abuse, crime, and violence.

RTI also conducts a broad range of applied research and evaluation in health promotion, disease prevention, health and environmental economics, and technology transfer, with special emphasis on individual, social, and environmental factors that affect modifiable health behaviors and human welfare. A growing collection of research focuses on health communications, including literacy and health literacy. Among social and environmental factors of interest are public policies and regulation, media and communications, communities, schools and workplace, and interpersonal and individual psychology.

Special Areas of Focus and Strength

Economic research covers healthcare costs and cost-effectiveness, behavioral health economics (especially substance abuse and mental health), prevention effectiveness economics, and payment and reimbursement issues. Particular emphasis is placed on healthcare financing, insurance, payment, and reimbursement issues, especially those affecting Medicare and State Children's Health Insurance Programs (SCHIPs). RTI conducts extensive evaluation and research for the Centers for Medicare and Medicaid Services (CMS). RTI's Medicare payment research includes developing risk adjustment algorithms for managed care and Medicare Part D (prescription drug) plans, implementing and evaluating

competitive bidding and pay-for-performance demonstrations, redesigning provider payment systems (e.g., for post-acute-care providers and for psychiatric hospitals and units), and making technical refinements of prospective payment systems and physician fee schedules. Medicaid and SCHIP research has focused on enrollment and retention, managed care, long-term care, and evaluations of 1,115 waiver demonstrations, including the Oregon Health Plan. Many of these studies are mandated by the U.S. Congress and are used to support new federal policies and regulations.

RTI performs cost-of-illness studies and cost-effectiveness analysis. This work includes designing and evaluating interventions to prevent obesity, diabetes, coronary heart disease, cancer, infectious diseases, injuries, and other preventable causes of disability and death. Related research evaluates strategies to boost positive health behavior and reduce risky behaviors such as smoking, substance abuse, and domestic violence.

Research on access to healthcare, apart from the wide variety of projects concerned with public and private insurance schemes, focuses on vulnerable populations such as minority or low-income populations; on patient populations defined by substance use and abuse, tobacco use, mental illness, and HIV/AIDS; and on incarcerated persons. Many studies focus on subsets of these vulnerable populations, such as low-income children and elderly persons belonging to racial and ethnic minority groups. Health and healthcare delivery for active-duty military populations and dependents are expanding targets of RTI research. Numerous projects concern the elderly and disabled, especially with respect to long-term care and rehabilitation. Health and healthcare disparities represent a growing portion of the health services research portfolio, with particular emphasis on access to cancer screening and treatment, family planning services, preventive and primary care, high-tech surgery, and prescription drugs. Geospatial analysis (e.g., for breast cancer) and complex modeling techniques are increasingly being applied.

RTI addresses quality of healthcare through several broad programs, including an Evidence-Based Practice Center (EPC) for conducting systematic and comparative effectiveness, a Developing Evidence to Inform Decisions About Effectiveness Center (DEcIDE) for projects related to the

comparative effectiveness of therapies and delivery systems, and an Accelerating Change and Transformation in Organizations and Networks (ACTION) to study change within healthcare organizations; all are supported by the U.S. Agency for Healthcare Research and Quality (AHRQ). RTI researchers develop and evaluate quality measures and indicators of patient safety such as injury detection triggers, refine and apply methods for detecting adverse drug events, develop and test methods for public reporting of quality performance, and analyze the effect of payment policy on quality of healthcare. Applying methods to assess quality of life and patient-reported outcomes is a growing feature of RTI research. Research involving clinical measures of quality, processes of care, and outcomes addresses issues for the U.S. Department of Health and Human Services, the Department of Defense, and international pharmaceutical clients and foundations.

Virtually all health technologies and interventions fall within the purview of RTI health services research: counseling and behavioral interventions, diagnostic and screening tests, prevention activities such as immunization or chemoprevention, all forms of therapeutics (especially pharmaceuticals), and rehabilitation services. Similarly, virtually all types of chronic diseases (e.g., cancer, cardiovascular diseases, depression, and obesity), many prevalent and emerging infectious diseases (e.g., HIV/AIDS, avian influenza), genetic conditions (e.g., Fragile X), and various lifestyle behaviors (e.g., smoking, poor nutrition, physical inactivity, obesity, smoking, and the use of alcohol and licit or illicit drugs) figure prominently in the RTI research portfolio.

Kathleen N. Lohr and Janet B. Mitchell

See also Agency for Healthcare Research and Quality (AHRQ); Centers for Medicare and Medicaid Services (CMS); Healthcare Financial Management; Medicaid; National Center for Health Statistics (NCHS); Public Health; Public Policy; Women's Health Issues

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 RTI's Evidence-Based Practice Center (EPC): <http://www.rti.org/epc>

RURAL HEALTH

What constitutes rural in healthcare depends on the definition being used for rurality, and that is sometimes dependent on the type of healthcare being delivered. There currently is no consensus definition of what rural is in the United States, either for health or for other policy domains. Since 1910, the U.S. Census Bureau has used a threshold of 2,500 people living in an incorporated place as its definition of rural; that definition remains in place today, but it is seldom used except for classification purposes in the census. A more widely used and recognized definition is the "metropolitan" designation process developed by the U.S. Office of Management and Budget (OMB), the White House office responsible for devising and submitting the president's annual budget proposal to Congress. The OMB classifies counties as metropolitan if they include a central city of at least 50,000 people or contain an urban cluster of that size or if they are closely tied to central metropolitan counties by commuting or economic trade patterns. The OMB originally identified only metropolitan counties but later designated core and other metro counties. In 2000, the nonmetropolitan counties with small urban centers were classified as "micropolitan." The U.S. Department of Agriculture (USDA) has created several different classifications of nonmetropolitan counties (non-Core Based Statistical Areas, functional regions based around an urban center of at least 10,000 people) that are often used to scale the degree of rurality of counties. These include the Rural Continuum Code and the Urban Influence Codes. An alternative, fine-grained classification system based largely on commuting patterns, the Rural Urban Commuting Areas (RUCA) codes, is based on clusters of census blocks or block groups; it has been adapted to apply to U.S. Postal Service ZIP

code areas. Federal and state policies that apply to health programs and regulations often specify one or more of these classification systems to guide the allocation of funds or application of rules to rural communities and populations.

The Rural Population in the United States

The United States was, for most of its history, a rural, agricultural nation. It was not until the 1920 census that the urban population of the nation exceeded the rural for the first time. In that year, the rural population was 50,866,899, or 48.1% of the total U.S. population. Since that time, the nation's rural population has remained relatively stable, growing to 59,274,456 in 2000. However, the rural proportion dropped to just over 20% of the total population of the nation. Alternatively, since the 1950s, the OMB chose to develop the metropolitan statistical areas designation to separate urbanized or city-oriented from other counties. In 2005, a total of 1,090 counties in the nation were metropolitan and constituted 83.2% of the U.S. population; 693 counties were micropolitan, 10.3% of the nation's population; and 1,358 counties were non-Core Based Statistical Areas, 6.6% of the total population. In 2005, the estimated total U.S. population living in nonmetropolitan counties was 54,566,948.

Rural Health Services Research

Rural health services research grew out of social and policy concerns with access to medical care and the health consequences of poverty that are closely associated with many rural areas. The problem of the relative deprivation of rural areas and its effects on health was noted in the 1920s, with structural assessments completed by the Farm Security Administration (FSA), a product of the New Deal. The FSA promoted prepaid medical group practice cooperatives as one way to meet the healthcare access needs of rural areas. This laid the foundation for the development of the staff model managed-care systems and health maintenance organizations (HMOs). The FSA also supported analysis of these programs and their outcomes and impacts, and this work was an early forerunner of health services research.

Plans for regionalization of healthcare services were proposed early in the 20th century as one way to ensure that rural places would receive the necessary care. In Great Britain, the work of Lord Dawson of Penn in his plans for a hierarchical system of clinics and hospitals stimulated future American healthcare planners associated with the Committee on the Costs of Medical Care (CCMC), which met from 1927 to 1932. The committee began work to estimate the necessary minimum population that could support what were termed "primary" medical centers that would provide medical services in the smaller towns and villages. The idea of a hierarchical structuring of regionalized medical services became part of the federal Hospital Survey and Construction Act, also known as the Hill-Burton Act, which supported the construction of hospitals in many rural communities from 1946 through the 1960s. The basic planning methodologies developed in the process of implementing the Hill-Burton Act formed the structure for later analytic work attempting to balance place-based needs with services. The subsequent federal planning legislation of the 1970s supported the development of methods to allocate resources, project supply, and anticipate demand. This work formed the underpinnings for determination of appropriate levels of utilization of services, a theme that later emphasized the ability of populations to gain access to healthcare.

The relative supply of physicians between rural and urban places was a concern of Milton I. Roemer and Frank G. Dickenson of the American Medical Association. Their work in the 1950s was centered on the development of appropriate geographic service areas to properly assess and guarantee distribution of care. This assessment of geographic distribution and variations in supply anticipated the later work of John E. Wennberg at Dartmouth Medical School.

In the 1950s and early 1960s, the problems of overall physician supply were apparent, and rural-focused research emphasized the analysis of health manpower needs as well as the development and assessment of alternatives to resolve that problem. The economics of physician workforce distribution with a specific emphasis on rural places developed in the emerging field of health services research with the work of health economists

including Rashi Fein, Uwe E. Reinhardt, and Frank A. Sloan. The primary-care needs of rural places became one of the principal reasons for the development of the new professions of nurse practitioner and physician assistants, and evidence supporting their efficacy was collected in many rural communities. These same economists tackled the issues of substitution and complementarity of clinical roles as these “new health professionals” found political acceptance.

The late 1960s and 1970s saw the emergence of subsidized primary care programs and clinics in the form of comprehensive community health centers, hospital-based clinics, nurse practitioner-staffed clinics, outreach programs, and physician leadership programs. Given the relative shortage of resources, many of the clinics were established in rural places, and a number of programs stimulated their development. The variety of organizational structures of rural primary-care systems stimulated a series of studies that compared the relative efficiency and effectiveness of these organizational forms via work led by Stephen M. Shortell and Cecil G. Sheps with funding from various foundations and the federal government.

The Medicare program based its payments for hospitals and physician services partly on the location of the provider during this period. The system recognized wide geographic differences in costs and charges in the “usual, customary, and reasonable” payment system that was eventually modified into a system that differentiated between cities and the rural parts of states and regions. Medicare structured its payments to hospitals using a geographic modifier to account for past payment patterns and underlying labor costs. This created a pattern of inexplicably and dramatically different payment levels between seemingly similar adjacent counties but a relatively consistent gradient between urban and rural areas, with providers in metropolitan areas receiving higher payments than those outside those places. This differential was especially apparent with the release of payment indexes for managed-care organizations after the passage of the federal Tax Equity and Fiscal Responsibility Act (TEFRA) of 1982. The system created an average adjusted per capita cost (AAPCC) mechanism to guide managed-care payments; these created very large gaps between urban and rural payment levels. This formalized

system generated an organized political response that, in turn, unified the several differing advocacy organizations representing rural interests into the National Rural Health Association (NRHA), which, in turn, pressed for a lead federal agency to promote the cause of rural healthcare in the federal government. Legislation creating the federal Office of Rural Health Policy (ORHP) was passed in 1987 and was organized in the following year. The authorizing legislation for the ORPH called for a research agenda, which led to the funding of a group of rural research centers in 1988.

One of the first issues the rural research centers investigated was the viability of small, rural hospitals. In the 1980s there was concern that these institutions would not be able to weather the effects of a rural economic downturn. The Inspector General’s Office in the U.S. Department of Health and Human Services noted that there was an alarming trend toward closure of small rural hospitals, which could be attributed to aggressive competition from urban hospitals and the demands of rapidly developing technologies that required significant economies of scale. The problems of rural hospitals were identified in various research studies as lack of technology and gaps in management and leadership as well as a fundamentally skewed payment system in Medicare. A demonstration of a new form of provider, the Medical Assistance Facility (MAF), was fielded in Montana in 1987. The MAFs were scaled-down hospitals that restricted their size and range of services but maintained emergency and limited inpatient facilities in remote, frontier communities. The Health Care Financing Administration (now the Centers for Medicare and Medicaid Services [CMS]) granted a waiver allowing Medicare payments to these institutions. That was followed by a seven-state demonstration of the Essential Access/Rural Primary Care Hospital provider type authorized under the federal Omnibus Budget and Reconciliation Act of 1989, which was replaced in the Balanced Budget Act of 1997 by the Medicare Rural Hospital Flexibility Program, which created critical-access hospitals (CAH). These demonstrations were accompanied by evaluation and research that showed the viability of the concept of a limited-service rural hospital. By 2007, there were over 1,250 CAHs dispersed through all but two states in the nation.

Rural healthcare systems have used several options to guide their structure, with networks and consortia being the primary organizational tool. Early rural hospital cooperatives and consortia were created in the upper Midwest, which allowed many smaller hospitals to share resources and promoted their survival. Networks are promoted by federal legislation, including the Medicare Rural Hospital Flexibility Program, which requires the CAHs to link with a larger, more complex hospital as well as emergency services and policy development partners. The trend toward networking and collaboration was given a boost by the Institute of Medicine (IOM) in a 2005 report that found that cooperation among providers allowed for better access and quality of care.

Health Services and Vulnerability

Data from the National Health Interview Survey (NHIS) and the Medical Expenditure Panel Survey (MEPS) indicate that self-reported health status is generally worse among rural residents than among urban residents and that this situation has persisted over the past two decades. After adjusting for differences in age, NHIS respondents living in nonmetropolitan counties were more likely than metropolitan residents to rate their health as only fair or poor. Similar patterns in self-reported health status were also found among MEPS respondents. Likewise, most chronic diseases have been, and continue to be, more prevalent in rural areas. Data from the NHIS also confirm these patterns for chronic conditions such as various types of joint pain, low back and neck pain, and vision and hearing problems. In addition, data from the U.S. Centers for Disease Control and Prevention (CDC) show higher rates of obesity, cigarette smoking, and total tooth loss in nonmetropolitan counties.

During the past decade, rural areas have seen a steep decline in manufacturing jobs (which tended to offer higher rates of employer-sponsored health insurance coverage than other jobs), accompanied by a rise in service-sector employment, where access to health insurance has been much lower. This has resulted in a greater percentage of rural residents being uninsured than urban residents. In 2001–2002 nearly 4 million rural families (30%) had at least one uninsured member. And many

rural residents with private health insurance may face large out-of-pocket costs for care as a result of being underinsured.

Some of the earliest research on rural healthcare focused on the geographic distribution of physicians. That has continued in studies of the distribution of primary-care practitioners as part of policies intended to identify the places with the fewest health professional resources, either as health professional shortage areas (HPSAs) or as medically underserved areas (MUAs). These designations are used by the federal government to qualify localities for a multiplicity of programs that allow them to seek grants for clinics, placement of practitioners, and special payment regimes under Medicare and Medicaid. Underserved areas are defined and designated by the Shortage Designation Branch of the Health Resources and Services Administration's (HRSA) Bureau of Health Professions. Both geographic areas and population groups can be classified as either shortage or underserved areas. The percentage of both metropolitan and nonmetropolitan counties with either a single-county or a part-county primary-care HPSA designation increased from 1987 to 2004. Over 75% of nonmetropolitan counties were designated as HPSAs by 2004.

Other Health Professions and Services

The geographic distribution of health professionals in rural areas has long been identified as a problem; more than half of all the nation's counties have no licensed psychiatrist or psychologist, and virtually all these counties are rural. As of 2004, 79% of nonmetropolitan counties and 55% of metropolitan counties were identified as being either single- or part-county mental health HPSAs. Counties with mental health HPSA designations have a shortage of psychiatrists and/or other core mental health professionals such as clinical psychologists and clinical social workers.

Rural communities have proportionately fewer dentists than urban places. In 2004, there were 3.8 general practice dentists per 10,000 urban residents but only 2.3 per 10,000 rural residents. The geographic distribution of registered nurses in nonmetropolitan counties is proportional to the general population distribution, but in the least populous and most isolated rural counties, the

numbers are below the general population share. Public health agencies in rural places also tend to have smaller staffs, lower budgets, and less technical capacity than in urban areas.

Persistent Problems

The nature of rural places makes them less attractive to many professionals and less able to invest in high-technology, high-cost healthcare services. This economic reality presents a challenge to public policies that attempt to equalize access to services in government programs such as Medicare and Medicaid and for the regulation of private health insurance. A constant challenge to researchers and policymakers is to identify optimal minimums of healthcare services that should be provided to small and isolated populations. The same problems of scale affect the diffusion of clinical as well as organizational innovations. Rural communities often have less access to newer medical technologies and specialized treatments. Health reform programs that depend on market forces, such as managed-care programs or group practices, often do not work well in rural places.

Rural communities and rural health policies remain an important part of national healthcare policy due to the structure of the U.S. Congress, which gives proportionately greater power in the U.S. Senate to the residents of the more sparsely populated states of the West and Midwest. This political reality has provided a balancing force to even out the market forces that often leave rural communities at a disadvantage.

Thomas C. Ricketts

See also Access to Healthcare; Geographic Barriers to Healthcare; Health Planning; Health Professional Shortage Areas (HPSAs); Health Resources and Services Administration (HRSA); Medicaid; Medicare; Primary Care

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- National Rural Health Association (NRHA): <http://www.RuralHealthWeb.org>
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S

SACKETT, DAVID L.

David L. Sackett is widely regarded as one of the originators of evidence-based medicine (EBM), which is the integration of the best research evidence and clinical expertise in the care of individual patients. Evidence-based medicine has revolutionized the thinking of many clinical practitioners.

Over the years, Sackett has developed and mentored a cadre of applied clinician-scientists who have disseminated the practice of evidence-based medicine throughout the world. These research teams have been at the forefront of medicine. They were the first to validate the efficacy of aspirin and carotid endarterectomy for patients with threatened stroke. They developed strategies for hypertensive patients to comply with their drug regimes. And they found compelling evidence for the effectiveness of nurse practitioners.

Sackett was the founding chair of the Department of Clinical Epidemiology and Biostatistics at McMaster University in Hamilton, Ontario. He rose through the academic ranks at the university and became professor and chair of the Division of Internal Medicine. After nearly 27 years at McMaster University, Sackett moved to Oxford University in 1994 to become founding director of the Centre for Evidence-Based Medicine and professor of Epidemiology in the Nuffield Department of Clinical Medicine. He also was founding chair of the Cochrane Collaboration Steering Group, which is an organization dedicated to the dissemination of

systematic reviews of the effects of healthcare interventions.

Sackett has authored many books in the field of epidemiology, including *Clinical Epidemiology: A Basic Science for Clinical Medicine* and *Evidence-Based Medicine: How to Practice and Teach EBM*. He has also authored or coauthored over 300 journal articles. Sackett has been involved in hundreds of randomized controlled trials (RCTs) as a principal investigator, consultant, or member or chair of a data safety monitoring board.

Sackett has received numerous honors and awards, including the Trillium Clinical Scientist Award, the Zinkoff Honor Award, the J. Allyn Taylor International Prize in Medicine, and the Health Services Research Prize from the Baxter International Foundation, and he was elected to the Canada Medical Hall of Fame. He is a fellow of the Royal College of Physicians of London and Edinburgh. He is also an elected member of many learned societies, including the Royal Society of Canada, the American and Canadian Societies for Clinical Investigation, the Association of American Physicians, the Canadian Society for Internal Medicine, and the Pan American Health Association.

Born in Chicago, Sackett earned a bachelor's degree from Lawrence College in 1956. He earned a second bachelor's degree from the University of Illinois in 1958. He then went on to earn his medical degree from the University of Illinois College of Medicine, followed by a medical residency at the University of Illinois Research and Educational Hospital. Sackett then completed a postdoctoral

fellowship in nephrology and earned a master of science degree in epidemiology from the Harvard School of Public Health. He also was awarded a doctor of science degree from the University of Bern.

Currently, Sackett resides in Canada, where he continues to write and teach. He is the founder and director of the Kilgore S. Trout Research and Education Centre in Hamilton, Ontario, an organization dedicated to training young researchers.

Jared Lane K. Maeda

See also Clinical Practice Guidelines; Cochrane, Archibald L.; Epidemiology; Evidence-Based Medicine (EBM); Outcomes Movement; Public Health; Quality of Healthcare; Randomized Controlled Trials (RCTs)

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Trout Research and Education Centre at Irish Lake:
<http://users.sitewaves.com/index.cfm?member=sackett>

populations. Some responses reflect governmental mandates, while others represent institutional missions or charitable initiatives to offer free or reduced-fee care. In its 2000 report, *America's Health Care Safety Net: Intact But Endangered*, the national Institute of Medicine (IOM), arrived at a two-tiered definition of safety net providers. Most broadly, it defines the safety net as including those organizations that provide healthcare services to the uninsured, Medicaid recipients, and other vulnerable populations. In addition, it singled out a subset of core safety net providers with two distinguishing characteristics: (1) by legal mandate or explicitly adopted mission, they maintain an "open door," offering access to services to patients regardless of their ability to pay, and (2) a substantial share of their patient mix is composed of uninsured, Medicaid recipients, and other vulnerable patients. Taken together, these providers and the resources that support them constitute a distinct system of care for the nation's most vulnerable individuals.

This entry provides an overview of how the safety net emerged as the nation's healthcare system evolved. Subsequent sections describe components, sources of financing, threats to stability, and resources for monitoring the safety net. Health services researchers and policymakers have become increasingly interested in and concerned about the nation's safety net as healthcare costs rise and the number of uninsured persons continues to grow.

History

At the beginning of the 20th century, medical care was neither particularly costly nor effective for most conditions. Middle- and upper-middle-income families typically received medical care in their home. The major economic concern associated with illness was lost wages. Hospitals were most often charitable institutions supported by local government appropriations predominantly serving as respites for the poor. Private donations and fees supported a smaller number of religious or ethnically affiliated institutions. However, as services became more sophisticated and costs rose—with the advent of modern anesthetic techniques, antiseptics, and antimicrobial agents—medical care became a valuable and costly commodity. Health insurance began to emerge during

SAFETY NET

The nation's healthcare safety net is a patchwork of responses to the health needs of underserved

the Great Depression as prepaid hospital plans. During World War II, at a time when the U.S. Congress had instituted wage and price controls, employers competed for scarce labor by offering health insurance benefit packages. In addition, the federal government waived payroll taxes for employer contributions to employee health insurance plans. These incentives established the linkage between employment status and access to private health insurance that characterizes the United States today.

Government support of private approaches to insuring healthcare coverage evolved in the context of several failed attempts to institute a universal health coverage program dating back to the early years of the 20th century, again during the Great Depression, and following the election of President Harry S. Truman in 1948. The continued rise in healthcare costs accompanied by incremental rather than universal expansion of health insurance created serious gaps as more Americans found themselves in need of services they could not afford. In 1946, the U.S. Congress passed a law called the Hill-Burton Act, which gave health facilities grants and loans for construction and modernization. In return, the facilities agreed to provide a reasonable volume of services to persons unable to pay for care. The 1960s saw the emergence of Medicare to improve access for the elderly and disabled and Medicaid to improve access to those most impoverished and ill.

Despite governmental incentives and subsidized programs, there existed no guarantee of basic care to those without coverage for an emergency condition. It was not until 1986 that the U.S. Congress passed the Emergency Medical Treatment and Active Labor Act (EMTALA) to prevent hospitals that have entered into provider agreements under the Medicare program from denying medical services to patients with emergency medical needs because of their inability to pay. The essential provisions of the statute are that every patient must receive a medical screening examination and obtain appropriate stabilizing treatment or be transferred to another facility, if clinically indicated, for an emergency condition. The law applies to any hospital-based provider, including off-site clinics and primary-care centers that operate under the name, ownership, and financial and administrative control of the institutions that contract with Medicare.

An important difference between EMTALA and other incremental reforms to improve access, however, is that EMTALA is an unfunded mandate. In other words, the law provides no financial support for the required services. As a result, it places an enormous burden on patients who are shouldered with bills they cannot pay and on the hospitals that serve them and accrue the resulting bad debt.

In sum, over the past century incremental reforms to broaden access to healthcare have followed failed attempts to establish any system of universal healthcare coverage, resulting in federal and state programs, incentives, and statutes that benefit some individuals but not others. The emergence of a safety net system of providers has been an outgrowth of this process.

Components

As noted above, the IOM has distinguished between core providers and other providers in the healthcare safety net system. Core providers include two groups. First, there are “essential community providers,” defined by the U.S. Congress in 1993 as those located in federally designated Medically Underserved Areas (MUAs); these include Community Health Centers/Federally Qualified Health Centers (FQHCs), FQHC Look-Alikes (FQHC-LA), and many public hospitals and local public health departments. These facilities are typically eligible for various federal and state grants or subsidies. Second, there are mission-driven organizations that may not meet the criteria for essential community provider but nevertheless serve a disproportionately poor and uninsured population. Although the care of the uninsured is concentrated among core providers, the absolute volume of uncompensated care is larger across the many, primarily not-for-profit community hospitals and academic medical centers, private practitioners, and school-based health centers that make up what has been called the hidden safety net. Finally, although considered distinct from the safety net system because they serve two narrowly circumscribed populations, the Veterans Health Administration (VHA) and the Indian Health Service (IHS) provide care to two large groups that include many otherwise uninsured Americans.

Geographic regions of the nation vary greatly in their dependence on core versus noncore healthcare safety net providers. New York, Los Angeles, Chicago, and Atlanta all have major public hospitals or healthcare systems that cater primarily to the indigent and underserved. At the other end of the continuum are regions that rely on mainstream private institutions. Instead of directing low-income patients to a public hospital system, indigent patients are dispersed across a subset of private hospitals and clinics with a mission that includes them. Philadelphia, for instance, has not had a public hospital since 1978, and inpatient services for the uninsured are distributed across the 25% of mostly private hospitals in Pennsylvania that provide more than half of all services to the state's Medical Assistance Program. Proponents of the former emphasize the specialized services (e.g., assisting patients with language and cultural barriers) and focus of core providers. Proponents of the latter emphasize that mainstreaming safety net care avoids a potentially two-tiered healthcare system.

In differentiating core from noncore safety net providers, it is also useful to distinguish between the two types of uncompensated care: charity care and bad debt. Whereas the former refers to free or discounted health-related services to individuals deemed unable to pay, the latter relates to charges that hospitals or other providers have not collected from patients who are expected to pay. While both core and other safety net providers deliver unusually high amounts of uncompensated care, core providers typically stand out for their willingness not to bill many of their patients and to employ generous sliding-fee scales, thereby providing much charity care. Unfortunately, there has been a lack of available data about the proportion of uncompensated care that is due to bad debt versus charity care at many institutions—mainly due to inconsistent hospital bookkeeping and reporting practices, but core safety net providers are clearly the major source of the latter. Whereas the distinction has not, historically, been so significant to providers since both represent unreimbursed costs, for patients the inability to pay medical bills or even the fear of accruing such debt can significantly affect access to needed care. Health services-related bad debt is now the leading cause of personal bankruptcy in America.

In recent years, there has been a public outcry over the aggressive collection practices of many hospitals attempting to reduce bad debt while at the same time reporting high levels of uncompensated care. In the case of not-for-profit hospitals, the issue is that these entities receive considerable tax benefits with the expectation that they will “give back to their communities” an amount that is at least commensurate with those benefits. The concern is that hospitals that claim high uncompensated care costs but are primarily accruing those losses because of bad debt are not really serving a safety net function. An alternative argument, however, is that the willingness of some of these hospitals to provide certain services—such as trauma care—at a predictable loss in poor communities, to care for many publicly insured or uninsured patients despite their inability to pay at cost, and to write off losses from the latter without using overly aggressive collection practices constitutes an essential safety net function even if there is little documented charity care.

Financing

To care for some patients at a loss while still remaining in business, healthcare providers must be able to offset those losses from the revenues generated by other payers—a process known as cost shifting, from private donations, or from government funds or government-mandated charity-care pools. Alternatively, they must cut their expenses. Historically, prior to World War II, most charity care was financed by private donations. Then, with rising healthcare costs and the growth of indemnity health insurance, cost shifting became an important presumed mechanism to finance the care of the poor. More recently, however, economists have questioned the role of cost shifting. Empirical analysis of hospital charges to private insurers provides little evidence that markups have correlated with or offset rising uncompensated care costs, even during the pre-managed-care era, when hospitals were thought to have the capacity to raise prices. Instead, in the absence of other sources of revenue, such as federal subsidies, providers with a high indigent care burden cut costs by reducing personnel, limiting charity care, eliminating service lines that are loss leaders, and putting off pay increases for staff.

Because of the limited capacity of providers to shift costs, they depend on a variety of funding sources at the federal, state, and county levels. One important source has been Medicaid disproportionate-share (DSH) hospital payments. Established in 1981 by the U.S. Congress, the Medicaid DSH program requires state matching funds. Initially this dampened its appeal, until states adopted a number of ways to count various state expenses from other agencies to justify federal dollars in the 1990s, through a process known as Inter-Governmental Transfers (IGT). Unfortunately, some states misdirected the funds obtained toward ineligible healthcare or even non-healthcare-related expenses. Another problem was that since DSH payments were linked to Medicaid volume rather than to the volume of uninsured, an increasingly poor correlation between these two payer groups (as more and more upscale providers competed for Medicaid dollars but not for the uninsured) diluted the program's benefit to the safety net. As a result, the U.S. Congress passed laws limiting DSH payments to states (state DSH allotments) and to hospitals (hospital-specific DSH caps), the latter linked to the hospital's overall uncompensated-care costs. States and their hospitals must also currently comply with new auditing requirements that demonstrate that DSH payments are in fact offsetting the costs of care of indigent patients receiving medical services.

Although Medicaid DSH payments were originally established to fund hospitals, a number of states have found innovative and legitimate strategies to direct the funds toward primary- and preventive-care services, often with hospitals' support. In Maine, unused state DSH funds contributed to a Medicaid expansion for uninsured adults without dependent children called Access Health. In Georgia, DSH hospitals contribute funds to extend primary-care services through a program called the Georgia Indigent Care Trust Fund, which includes case management for the uninsured chronically ill and for pharmaceutical support. In Massachusetts, an uncompensated-care pool that supports both inpatient and community-based care is financed with DSH funds in addition to assessments on hospitals and health plans. In sum, Medicaid DSH funds are being successfully stretched across the safety net in many locales to cover a broader range of services than was originally intended.

Medicare DSH payments have also been an important source of additional revenue for safety net providers. Also dating to the 1980s, this adjustment was originally intended to compensate those hospitals serving a disproportionate number of low-income Medicare patients, who tend to be sicker and therefore more costly to serve than others with the same diagnosis. Specifically, the DSH payment is an add-on to the Diagnosis Related Group (DRG) payment, established 2 years after Medicare's prospective payment system (PPS) began in 1983. Although Medicare's PPS was established with no new money—by lowering the basic DRG rate and decreasing indirect medical education (IME) payments to teaching hospitals (which benefit from the DSH payments)—the program grew in the 1990s as the U.S. Congress added money for various categories of hospitals, particularly safety net providers. More than 95% of Medicare DSH payments goes to urban hospitals. Hence, while the original intention of the Medicare DSH payment was to offset the higher costs of caring for poor Medicare patients, it has come to serve the broader purpose of financially assisting hospitals serving low-income populations in order to preserve access to care.

DSH payments represent just one mechanism of many for funding safety net providers that rely on a patchwork of support from federal, state, county, and other sources. These include, at the federal level, funding from the Ryan White Care Act, which supports the unmet healthcare needs of individuals living with HIV; the Public Health Service Act, which provides Section 330 grants to eligible community and migrant health centers, homeless programs, and public housing primary-care programs; the Rural Health Clinics program, which allows enhanced Medicare and Medicaid reimbursement to encourage nurse practitioners, physicians, and physician assistants to work together in provider shortage areas; and the Critical Access Hospitals program, which provides cost-based reimbursement in an effort to reduce hospital closures in medically underserved areas.

Although states support the safety net primarily with federal matching programs, the presence of state-only programs can broaden access by extending coverage to residents who would otherwise fall through the cracks. For instance, MediKan in Kansas covers individuals trying to get Social Security

disability benefits but who are not yet approved; Wisconsin's General Assistance Medical Program (GAMP) covers indigent Milwaukee County residents who are not eligible for Medicaid or the State's Children's Health Insurance Program (SCHIP); and Minnesota Care and Basic Health (in Washington state) both provide subsidized insurance to Medicaid-ineligible residents not covered by other programs. Such state-only programs are relatively few and far between because of the challenge of enacting adequate financing mechanisms, usually through new taxes or cuts in other services.

In some states, counties contribute substantial funds and services to safety net care, while in others they do not. In Texas, for instance, counties are legally responsible for funding indigent care. Uninsured individuals receive services through county hospitals or local public health departments. In regions of the state without public hospitals or health systems, counties are required to administer an indigent healthcare program for eligible residents by funding services in the private sector. Counties receive state subsidies or matching funds depending on the cost and volume of the indigent care services they provide. As in Texas, the 58 counties in California play a crucial and state-mandated role in financing and delivering safety net services. Within these states, counties have substantial discretion in how they interpret requirements, so services vary widely. In contrast, in Alabama and Mississippi, few county programs exist for indigent care beyond those funded by Medicaid.

Finally, in addition to the federal, state, and county support, the safety net receives some support and resources from foundation grants, managed-care companies, and manufacturer's indigent drug programs. For instance, the Virginia Health Care Foundation was initiated in 1992 as a public-private partnership to raise private funds to supplement public indigent care services.

Challenges

The challenges affecting the nation's healthcare safety net include the rising numbers of uninsured individuals needing care and the changing structure and environment of the healthcare marketplace. The impact of these challenges and the resilience of the safety net vary regionally, based on local support and structural factors that affect

the safety net providers. Structural factors include the degree to which safety net services are concentrated among providers, such as a few public hospitals versus a wider network; the extent to which the burden is shared by both public and private entities; and the overall price competitiveness of the marketplace.

Equally important is the purposefulness with which healthcare administrators and policymakers have responded to local challenges to develop or maintain robust safety net systems. In some cases, adaptation has led to mergers, as in the joining of publicly owned Boston City Hospital and the private Boston University Hospital to establish Boston Medical Center. There have also been conversions of public hospitals to not-for-profit private status to facilitate joint ventures or improve efficiencies, as in the creation of the non-profit Cambridge Hospital, previously an agent of city government. And there have been restructured relationships within the public system resulting in administratively independent entities such as Denver Health, which consists of an extensive horizontally integrated system that includes a medical center with Level 1 trauma services, nine family health centers in underserved communities, 11 school-based clinics, and a wide range of detoxification, correctional-care facilities and behavioral health services that have provided over \$100 million in charity-care services annually. In addition, Denver Health established the vertical integration of insurance, hospitals, and clinicians to create a large and financially viable Medicaid HMO called Colorado Access.

Other geographic regions of the nation have been less successful in building viable safety net systems or are greatly struggling to meet the growing needs of a large indigent population. Such locales typically lack strong core providers or mainstream health systems that are able and willing to provide substantial inpatient and outpatient safety net capacity. Little Rock, for instance, has struggled with inadequate safety net infrastructure and growing poverty, individuals without health insurance, and an influx of undocumented immigrants. A generous public insurance program for children has helped, as well as the engagement of faith-based charities and the participation of the city's academic medical center, where waits for specialist appointments for uninsured patients

average 6 to 9 months. Even the most evolved safety net systems, however, remain vulnerable to the vicissitudes of public revenue streams, particularly Medicaid funding. For example, although it has been successful for over a decade, Colorado Access was forced to drop its physical health Medicaid contract in 2006 because of a 15% drop in the state's reimbursement rate. It has adapted by focusing on providing access for low-income children and for those needing behavioral health services and on Medicare Part D products; but 65,000 individuals lost their Medicaid coverage. In sum, success depends on adopting good business models that improve productivity, collections, economies of scale, and technical expertise and diversifying revenue streams—but with a mission to providing care for the poor.

Monitoring

Given the precarious nature of the healthcare safety net, with its wide variation across geographic regions of the nation, the IOM recommended a monitoring system for tracking its stability and performance in meeting the needs of vulnerable populations. Beginning in 2000, the federal Agency for Healthcare Research and Quality (AHRQ) and the Health Resources and Services Administration (HRSA) embarked on a joint safety net monitoring initiative with three strategies: to provide baseline information on hundreds of local safety nets throughout the nation, to establish and disseminate a standardized methodology for regional analysts to monitor the ongoing status of their safety nets, and to provide specific tools for assessing local capacity and performance. Initially, two data books were produced that described the status of safety nets in over 1,800 U.S. counties, with information on demand for safety net services (based on measures of poverty, individuals without health insurance, and illness), financial support for indigent care (including funding for Medicaid, DSH payments, and community health centers), descriptions of safety net structure, and measures of outcome of safety net performance (such as preventable hospitalizations and barriers to accessing care). A subsequent publication detailed how to estimate local demand for uncompensated care, assess safety net provider financial status, and measure performance

and outcomes, among other strategies to aid regional analysts. Finally, the project generated Web-based tools, including a worksheet for evaluating an entity's financial risk relative to a distribution of other safety net providers.

Future Implications

America's healthcare safety net is a complex patchwork of institutions, providers, and funding streams that offer medical services to individuals who lack the financial resources to pay for the care they need. Although various federal initiatives fund safety net programs, there are wide regional differences that reflect local variations in funding, political priorities, and demand for uncompensated care. Recently, a growing number of states have been leading innovators in identifying ways to reduce the burden on the safety net by expanding health insurance coverage. For the foreseeable future, however, the safety net will remain a vast but limited resource for many in America who must try to access it when they need healthcare.

Saul J. Weiner

See also Access to Healthcare; Community Health Centers (CHCs); Federally Qualified Health Centers (FQHCs); Health Insurance; Medicaid; Rationing Healthcare; Uninsured Individuals; Vulnerable Populations

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Center for Studying Health System Change (HSC):
<http://www.hschange.com>

National Association of Public Hospitals and Health
Systems (NAPH): <http://www.naph.org>

Urban Institute: <http://www.urban.org>

SATISFACTION SURVEYS

Obtaining information on how patients rate a health-care facility and its providers and how satisfied they are with the care they receive has become a major focus of healthcare organizations. Although healthcare providers have been collecting such information for decades, in the past, it was viewed as a routine function with little practical utility. Patients were plentiful, and a consumerist approach was not in vogue. Patient satisfaction was not seriously considered as a method to improve quality and reduce costs.

Today, healthcare organizations are increasingly aware of the importance of keeping their patients satisfied as a way of preventing their shifting to other providers for their healthcare needs. As revenues become scarcer and competition more acute, many healthcare organizations are using patient satisfaction data to improve their services, increase revenue, and attain a superior market position.

Many healthcare providers view the delivery of care differently from their patients. They often view care as "fragmented," or being provided in "silos." Patients, on the other hand, tend to evaluate their total care experience as an integrated whole. Thus, the way patients view and evaluate their experiences may be completely different from the isolated view of providers and healthcare

organizations. The implication, of course, is that low satisfaction levels for one or two aspects of care may result in significantly lower subjective assessments of the quality of the entire organization. And one or two positive experiences, on the other hand, may not be generalized to the whole experience.

Background

In the past, many healthcare organizations viewed patients as an unlimited resource. If patients became dissatisfied with their health care, and chose to switch their source of care, most healthcare facilities firmly held the attitude that there were "plenty more where they came from." Patient satisfaction therefore was of neither practical nor theoretical interest. However, in the 1970s, patient satisfaction became a phenomenon of theoretical interest to health services researchers. Patient satisfaction was used as a subjective measure of realized access to care. As such, satisfaction with care became a dependent variable of research interest as well as a predictor of other healthcare outcomes, including compliance with medical advice and return visits for care.

Today, there is an unprecedented revolution in healthcare. The informed consumer, who through an information explosion propelled by scientific and technological advances, mass media coverage, and the Internet better understands treatment options, is not afraid to challenge healthcare providers if the care does not meet his or her standards. Since patients can no longer be viewed as an unlimited resource, consumers have taken control and, in some cases, have more information regarding their specific diagnosis than some of their healthcare providers. Information flow helps set the standards for individual health behavior and for patient involvement in the diagnostic, treatment, and curative processes. Properly analyzed, patient satisfaction data can point to areas of patient concern, which when corrected will improve quality, reduce costs, and bring the patient back into the process of care.

Importance of Patient Perceptions

There are many reasons why all healthcare organizations should be concerned about patient perceptions of quality and their level of satisfaction. First,

satisfied patients are more compliant, which results in better medical outcomes. That is, they will follow treatment protocols, such as completing drug regimens. Second, satisfied patients are more likely to return for follow-up visits. Third, patient satisfaction data provide managers with useful information regarding the outcomes of care themselves. Since satisfaction can be viewed as a proxy measure for the outcome of care, patient perceptions can point out process areas needing improvement. Fourth, patient satisfaction is a subjective measure of access to care. Fifth, patients who are satisfied tend not to file lawsuits. Sixth, satisfied patients, even if the medical outcome is not positive, tend to view the healthcare they were provided as a quality experience if they were satisfied with the level of care provided. Finally, patients, like all consumers, want and deserve to be satisfied with the products and services they purchase.

The Joint Commission recognizes patient satisfaction as part of its ORYX performance measurement system requirements. In addition, the National Committee for Quality Assurance's (NCQA) Healthcare Effectiveness Data and Information Set (HEDIS), ISO 9000, many state agencies, and the Malcolm Baldrige National Quality Award competition all consider patient satisfaction to be of very high importance. All contain regulations and guidelines for the measurement and reporting of specific satisfaction indicators. Many hospitals, health systems, and business cooperatives are publishing report cards with the same patient satisfaction indicators.

Data Collection Methods

The main way to collect data on patients' perceptions of the care they receive is to ask them. Doing so requires the use of a questionnaire and a survey process. Healthcare organizations use different survey techniques to collect their data. They must decide whether to interview their patients retrospectively at some time after they received care or to use a more prospective, point-of-service approach to capture patient perceptions as close to the time when they received care as possible. They also must decide the specific data collection strategy they will use. In general, there are three choices: a self-administered questionnaire, a personal interview, or a telephone survey. Each approach has its

own set of advantages and disadvantages that affect cost, response rates, and ease of follow up. Personal interviews of past patients tend not be used because they are very costly to conduct.

Using mail surveys can be the most cost-effective and reliable method to collect patient satisfaction information. Response rates should generally be in the 50% range. Major costs in conducting a mail survey include the printing of the survey and cover letter; postage, including survey return postage; follow-up reminder letters or postcards after the first mailing; and a second mailing letter and survey for a portion of the original sample. Staff time is needed for the process as well. Time must be allocated for assembling the cover letter and survey, addressing the envelope package, mailing the package, compiling return surveys, and preparing the responses for analysis. Information-system time is also required to generate a random sample of patients to be surveyed and to produce their addresses and mailing labels. In terms of time, as many as 40 hours per survey may be required to successfully complete the process. If a healthcare organization uses a third party vendor to conduct the survey, it should compile and distribute regular reports within the organization. If the survey is being conducted in-house, resources necessary to generate reports should also be considered.

Advantages of conducting mail patient satisfaction surveys include the following: the healthcare organization maintains control of the process; costs are limited to printing, postage, and staff time to administer the surveys; the result of the surveys are likely to be reliable; ongoing investment in the process of conducting the surveys can be constant and predictable for budgeting purposes; the surveys can be customized without much effort; the results from the surveys can produce data for benchmark comparisons; the surveys may provide actionable results within acceptable statistical variance; and they may be less expensive to conduct than using an outside company.

Disadvantages of conducting mail satisfaction surveys include the following: intensive internal staff effort is required to prepare the surveys for distribution; there is loss of control over individual questionnaires once they are mailed; the functional illiteracy rate in the United States is high, and patients may not understand the language used in the survey; it may be difficult to locate patients

such as those who are homeless; foreign-language-speaking patients may not be able to respond; return rates may vary greatly given the population being sampled; the lag time of results reporting can be from 30 to 60 days post survey mailing; if the survey is changed, it must be reprinted, thus increasing the costs; increases in postal rates can negatively affect the survey's budget; and staff departments involved in the survey process may stop or delay the timing of the survey.

The main difference between a mail survey and a telephone survey approach is the use of an interviewer. Using a telephone as the delivery mechanism, rather than the mail, means that an interviewer is necessary to ask the questions once a respondent is contacted. Interviewers are useful because they can circumvent the illiteracy problem, they can establish a sense of personal relationship, and they can assist the respondent if the questions are unclear.

Advantages of telephone patient satisfaction surveys include the following: there is immediate response and feedback, as it is a relatively fast process; callbacks are easy and inexpensive; it generally produces a greater response rate; no staff time is involved in data collection; standard questions are available; sample size and response by demographic group are more controllable; they produce reliable statistical results; they can produce large comparative benchmark databases; and they produce actionable reports and results.

Disadvantages of telephone patient satisfaction surveys include the following: they are more costly than mail surveys; customized questions may be available but at a premium price; patients receiving the telephone calls may view them as intrusive; individuals conducting the calls may be inconsistent in their presentations; some patients may not have a telephone; patients with multiple telephone numbers may be called several times; there may be multiple callbacks to obtain a response; the results of the survey may be difficult to compare with other survey methods if change is implemented; and comparative databases are generally unavailable for customized questions.

Point-of-service strategies include exit or discharge surveys, bedside surveys, or surveys of patients at any time during their visit or hospital stay. These data collection approaches are relatively simple for organizations to implement

in-house, but if done on a large scale, they can become complicated.

The advantages of point-of-service patient satisfaction surveys include the following: there is immediate feedback; the patient can enter information via a kiosk or a computer terminal; any problems or concerns presented can be immediately addressed; they are cost-effective in that the patient does the work with little direct staff involvement; reports can be computer generated from the database; it is easy to change or add questions; the surveys can be used as an ongoing method to acquire information; computer software to conduct the surveys is easily updated; and data from the surveys can be continuously collected.

Disadvantages of point-of-service patient satisfaction surveys include the following: responses to the survey's questions may be biased due to the patient's medical condition; patients may perceive a lack of confidentiality and/or anonymity; the data collection method usually involves nonprobability samples, making any generalizations difficult; the initial costs of point-of-service systems are generally high; no comparative database may be available; there is no method to control respondents, which may result in oversampling of population groups; patients may respond more than once during their stay; the results may not be statistically reliable; patients may be fearful of computers; and there is the potential problem of safeguarding electronic information.

The method by which an organization chooses to measure patient satisfaction will be based on issues such as cost, philosophy toward satisfaction, and how the results will be used. Perhaps the most frequently used strategy is a self-administered questionnaire approach. Usually, healthcare organizations rely on a mail survey approach because of its low cost and low pressure on patients to respond. Another approach, growing in popularity, is to use kiosks located around the healthcare facility. This allows patients to stop at their convenience to assess the level and quality of care received. The problem with this approach is that the resulting sample of patients is not random and may not include all patients in the population base. Should the sample not be indicative of the total population of patients, the results may be biased and not nearly as useful to administrators.

No matter what data-gathering approach is used, the heart of the process is the questionnaire itself. Those using patient satisfaction surveys should be concerned about their validity and reliability. Making meaningful quality and cost improvements requires high-quality, valid, and reliable data. *Validity* refers to whether a survey's question actually measures what it is intended to measure. *Reliability* refers to whether a survey's question measures the same thing each time it is used. Validity ensures reliability, but a reliable question is not necessarily valid. That is, a survey's question may be measuring the same thing each time it is used, but it is not measuring what it is intended to measure. Obviously, when it comes to using patient satisfaction data for improving the quality of care an organization provides, both issues are key. In addition, issues such as sample size, response rate, generalizability, and statistical significance must also be recognized to generate usable results.

To make quality decisions regarding improvement strategies, it is important that the data used to make such decisions is of high quality. The old data processing adage of "garbage in-garbage out" (GIGO) is relevant and applicable to using patient satisfaction data for quality and performance improvement.

Many healthcare organizations currently outsource patient satisfaction data collection to proprietary companies. The reasons for outsourcing the data collection are usually related to cost, convenience, and organizational competence. That is, some healthcare organizations feel that it is less expensive to outsource the work than to maintain a qualified staff of survey and statistical experts. Others organizations may feel that receiving satisfaction data from a proprietary company on a regular basis is convenient and reduces the non-clinical functions within the organization. Still others may feel that they do not have the necessary level of competence within the organization to carry out the tasks associated with collecting their own patient satisfaction data.

Even if a healthcare organization outsources its patient satisfaction data collection process, it would be unwise to haphazardly select a company without considering several key factors. The fact that a company is in the business of collecting data for hospitals and other healthcare organizations does not automatically ensure that it provides a

quality product. Before selecting any data collection company, issues surrounding two key questions must be satisfactorily addressed. First, is the data collection instrument valid and reliable? Second, what specific questions are asked?

Measuring Patient Satisfaction

There are two general approaches to measuring patient assessment of care. The first is to ask questions directly related to satisfaction levels. For example, "How satisfied were you with the overall quality of care at your last visit?" The respondent selects a response from a list of possible answers, such as very satisfied, somewhat satisfied, somewhat dissatisfied, and very dissatisfied.

An alternative approach is to use a patient rating system. An example of this strategy is to ask, "How would you rate the overall quality of the care you received at your last visit?"—with the possible responses of "excellent," "good," "fair," and "poor." Although it could be argued that these two strategies tap into different perceptions, they tend to be viewed within the healthcare industry as interchangeable.

A strategy that is used to accumulate data on the patient's experience with care is to divide the visit into its component parts. For example, questions pertaining to waiting time, appointment time, staff and physician communications, and so on are presented as separate items. This allows an analysis of the various parts that make up the whole visit or hospital stay. Usually, the last question asks about the overall satisfaction with the visit or stay. This approach permits the relative importance of each item to be measured against the patient's overall perception of the care, and it will identify where problem areas exist. The approach allows healthcare managers to focus intervention strategies for quality improvement where they are most needed. It also can be used to highlight areas where the providers do an especially good job, which allows the opportunity to establish best-practices protocols that can be used across the organization.

Future Implications

Querying patients about all dimensions of the care they receive across the health system provides the

opportunity to identify areas where the process of care fails to provide an encompassing, satisfying experience. Satisfaction is a valuable weapon that provides an organization an edge in a highly competitive marketplace. If a hospital or other health-care organization is not using available tools to understand and interpret patient satisfaction data, it is missing a valuable opportunity for improvement. Patient satisfaction data reflect the voice of the customer. That voice provides a very personal view of the process of care within the organization.

It is important that the patient's input be taken seriously when attempting any improvement strategies. Early on, patient satisfaction surveys were conducted primarily to show the patient that the health-care organization "cared," with little practical use for the results. With the move by health-care-accrediting organizations, insurance companies, and government agencies to obtain and use more patient outcome measures, health-care organizations are now being required to demonstrate how patient satisfaction survey results are used to improve care.

Ralph Bell

See also Healthcare Effectiveness Data and Information Set (HEDIS); Health Report Cards; Health Surveys; Hospitals; ORYX Performance Measurement System; Patient-Centered Care; Pay-for-Performance; Quality of Healthcare

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- Consumer Assessment of Healthcare Providers and Systems (CAHPS): <http://www.cahps.ahrq.gov>
- Council of American Survey Research Organizations (CASRO): <http://www.casro.org>
- Health Resources and Services Administration (HRSA) Health Center Patient Satisfaction Survey: <http://bphc.hrsa.gov/patientsurvey>

SCOTT, W. RICHARD

W. Richard (Dick) Scott has made significant contributions to the field of organizational theory and the application of this theory to health-care organizations. He has conducted extensive research on professional organizations, with particular emphasis on social welfare, educational, and medical organizations. Scott is Professor Emeritus of Sociology, with appointments in the Graduate School of Business, the School of Education, and the School of Medicine at Stanford University.

Scott has spent his entire academic career at Stanford University, where he was the founding director of the Stanford Center for Organizations Research. Scott's early research focused on the sociological study of authority and control relations in organizations. Along with his colleagues John W. Meyer and James G. March at Stanford, Scott soon became a key theorist of organizational analysis within the school of neoinstitutionalism. This school examines how organizations operate in institutional and societal environments that govern behavior beyond market forces.

Scott is well-known for his historical study examining changes in the health-care delivery system of the San Francisco Bay Area over a 50-year period. The study, which is published in *Institutional Change and Healthcare Organizations: From Professional Dominance to Managed Care* (2000), examines the profound transformation of health-care organizations in the Bay Area. It charts changes since World War II in the number and types of organizations delivering health-care services as these have been affected by changes in the resource environment—for example, demography, financing, supply of health professionals—and in the

institutional environment—for example, changes in institutional logics and governance systems.

Scott has authored or coauthored many books and has published over 150 scholarly articles. Specifically, he has authored three widely used textbooks on organizations, *Formal Organizations: A Comparative Approach* (1962), *Organizations and Organizing: Rational, Natural and Open Systems* (2007), and *Institutions and Organizations: Ideas and Interests* (2008).

Scott has received many awards and accolades throughout his distinguished career. He is an elected member of the National Academy of Sciences, Institute of Medicine (IOM), and was a fellow of the Center for Advanced Study in the Behavioral Sciences. Scott also received the Distinguished Scholar Award from the Management and Organization Theory Division of the Academy of Management as well as the Richard D. Irwin Award for a career of distinguished scholarly contributions to management. In 2000, the American Sociological Association, Section on Organizations, Occupations, and Work created an award in Scott's name to recognize his contributions to the field of organizational sociology. The award is given annually to honor the most outstanding article contributing to the advancement of the field.

Scott was born in 1932 in Parsons, Kansas. He graduated from Parsons Junior College with an associate degree in 1952. He went on to receive a bachelor's and a master's degree from the University of Kansas and later completed his doctoral degree in sociology at the University of Chicago in 1961. While at the University of Chicago, he studied under Peter M. Blau, one of the founders of the field of organizational sociology. Scott has received honorary doctorates from the Copenhagen School of Business (2000) and the Helsinki School of Economics (2001).

Scott continues to teach doctoral-level seminars and conduct scholarly work at Stanford. He is currently engaged in the theoretical work of combining institutional theory in organizations with social movement theory as well as conducting research on institutional change at the community and the transnational level.

Jared Lane K. Maeda

See also Healthcare Organization Theory; Hospitals; Managed Care; Medical Sociology; Mental Health

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- Stanford University Department of Sociology: <http://sociology.stanford.edu>

SELECTIVE CONTRACTING

Selective contracting is when an insurer, usually a managed-care plan, contracts with some but not all healthcare providers in a market. In essence, the insurer trades patient volume in return for lower provider prices. Selective contracting has been the comparative advantage that managed-care plans have used to enter and eventually dominate the nation's private health insurance market during the past 20 years. The selective contracting process was successful in introducing price competition into healthcare markets in the 1990s. The rapid increase in health insurance premiums in the past several years can be attributed, at least in part, to the erosion of selective contracting.

Overview

The basic idea surrounding selective contracting is that insurers contract with hospitals, physicians, pharmacies, and other healthcare providers based on factors such as services, quality, amenities, location, and, potentially, price. In the 1970s and 1980s, competition in healthcare was characterized as a medical arms race. More competitors in a market, measured as more hospitals in a geographic area, were associated with higher, not lower, prices as simple economic theory would predict. In as much as consumers were reasonably well insured and insurers entered into contracts with all local providers, there was little reason for a provider to offer a lower price. A lower price would garner little additional patient volume. Instead, more services, greater quality, and additional amenities attracted physicians and their patients. Thus, costs were higher in areas with greater nonprice competition.

Empirical Evidence

Efforts largely beginning in California began to change the medical arms race. California's state legislature passed laws that made it clear that insurers did not have to contract with all licensed providers in a market. Prior to the laws, hospital costs were higher in highly competitive markets in California. However, after enactment of the laws, cost increases were much smaller in the more competitive hospital market areas—the opposite of the medical arms race scenario.

Even more compelling evidence was found in an analysis of the hospital prices that were negotiated by the Blue Shield of California preferred provider organization (PPO). An analysis of the medical-surgical price per day that the PPO negotiated with 190 California hospitals showed that the PPO was able to obtain a lower price when there were fewer hospitals in the market; when the PPO had a larger share of a hospital's admissions; when a hospital had only a small share of the PPO's local book of business; and when there was idle capacity in the hospital or, indeed, in the local hospital market. These findings were strong evidence that the standard economic model was functioning in the hospital market. A number of other recent studies have generalized these findings beyond California.

Managed Care

The success of managed care in reducing healthcare costs is attributed to selective contracting and the reduction of expensive services on the part of managed-care plans. There is substantial evidence that managed-care plans, particularly health maintenance organizations (HMOs), have attracted lower utilizers of healthcare. It is less clear, however, whether this reduction comes about as a result of actions that the health plans take to enroll lower utilizers and shun high users or whether their enrollment reflects individuals who disproportionately like the concept of health maintenance and who dislike interacting with the healthcare system. The evidence that managed-care plans discourage the use of expensive services is scarce.

There is some evidence that sorts out the relative impacts of selective contracting, favorable selection, and treatment intensity on the lower use of healthcare in the case of managed care relative to conventional plans. Researchers examining the per-enrollee expenditures for eight medical conditions (acute myocardial infarction, live birth, four types of cancer, and Types 1 and 2 diabetes) among Massachusetts state employees in the mid-1990s found that the HMOs offered by the state had per-person claims costs that were \$107 lower for these conditions than the analogous claims costs for the same conditions in the conventional plan offered. Fifty-one percent of the difference was attributable to favorable selection. The HMOs attracted younger enrollees and people with a lower incidence of the medical conditions. An additional 5% was attributable to lower treatment intensity. Selective contracting accounted for 45% of the lower claims costs. As an example, the HMOs on average paid \$20,302 for an angioplasty procedure, while the conventional plan paid \$37,330.

Increase in Insurance Premiums

Selective contracting also provides a potential explanation for the more rapid increase in health insurance premiums that the country has observed during the past decade. Two explanations are typically advanced for this increase. One is a backlash against managed care. The other is a consolidation among providers. Both suggest an

undermining of the comparative advantage that was offered by selective contracting.

The managed-care backlash is said to consist of physician and patient complaints about the nature of the restrictions that managed-care plans imposed on access to healthcare. These include restrictions on self-referral and the use of various utilization management techniques. In addition, patients seem to be concerned about the quality of the providers potentially available to them in their managed-care panel. As a consequence, there has been growth in the preferred provider organization (PPO) model of managed care at the expense of HMOs. PPOs allow subscribers to use a wider set of healthcare providers if they are willing to pay higher copays to use non-panel providers. Whatever the merits of this shift, it has the consequence of undermining selective contracting. By expanding their networks and allowing subscribers to step outside the established network of providers, managed-care plans are unable to trade patient volume for lower prices. As a result, health insurance premiums continue to increase.

The consolidation explanation for higher health insurance premiums holds that hospitals have combined through mergers and acquisitions and physician groups have entered into larger groups and formed marketing networks to negotiate with managed-care plans. These activities also have the potential to undermine selective contracting. Consolidations and marketing networks reduce the number of competitors, remove idle capacity from the market, and increase the share of the insurer's subscribers using the new entities. All these actions have the potential to raise the prices that managed-care firms could negotiate through selective contracting.

Michael A. Morrisey

See also Competition in Healthcare; Healthcare Markets; Health Economics; Health Insurance; Health Maintenance Organizations (HMOs); Hospitals; Managed Care; Preferred Provider Organizations (PPOs)

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America's Health Insurance Plans (AHIP):

<http://www.hiaa.org>

National Conference of State Legislatures (NCSL):

<http://www.ncsl.org>

SEVERITY ADJUSTMENT

A common problem with comparing performance among healthcare providers is how to adjust for differences in the disease severity of patients. For example, the mortality rate of patients in Hospital A may be higher than in Hospital B, but unfair and misleading conclusions may be drawn if patient characteristics in the two hospitals are not taken into consideration. Perhaps Hospital A is more likely to serve a large number of indigent patients, who lack health insurance coverage and tend to delay care until later stages of the disease, while Hospital B serves a large number of upper-middle-class patients, who have access to routine and preventive care. When assessing the relative performance of these two hospitals, these patient differences must be accounted for in some way, a process referred to as severity adjustment.

Although severity adjustment might initially appear to be straightforward, the process may be very complex. Methods of severity adjustment depend on the availability of data, the accuracy of the data, and the costs of data collection. A large number of factors may affect the outcomes of care, including the patient's age, gender, race and ethnicity, coexisting diseases, and psychosocial and socioeconomic characteristics. There are also a number of different severity adjustment methods and models available that often do not lead to similar conclusions.

History

The first attempts to measure patient severity took place in the 1970s. Later, particular attention was paid to severity adjustment in 1983, when the nation's Medicare program adopted a Diagnosis Related Group (DRG)-based prospective payment system (PPS) for hospitals. Hospitals were concerned that the new system would not pay for the provision of care to "sicker" patients. There was also concern about the accuracy of the DRG concept, since it assigns patients based mainly on principal diagnosis codes. Since compensation levels were at stake, critics argued that diagnosis severity could be exaggerated by hospitals in an attempt to improve their "bottom lines." These issues prompted debate over the use of code-based versus medical record surveys to assess patient complexity; thus, there were considerable efforts by developers of severity measures to explore and test a number of systems, such as disease staging, severity scores of Patient Management Categories (PMCs), and All Patient Refined Diagnosis Related Groups (APR-DRGs).

Selection of Performance Outcome

In the process of severity adjustment, healthcare managers and researchers must decide on a performance outcome of interest. Outcome measures that could be attributable to healthcare quality include morbidity, mortality, readmission rates, complication rates, functional status, and patient satisfaction. By far, mortality has been the most frequently used generic measure of hospital performance. Advantages of using mortality include the wide availability of this information, its clearly definable end point, and its importance. Further decisions about the mortality outcome measure may include whether to use in-hospital mortality, 10-day mortality, 30-day mortality, or 1-year mortality.

While a generic measure of hospital performance such as all-cause mortality may be used, it may be of greater interest to evaluate a disease- or procedure-specific mortality (e.g., in-hospital mortality among patients with congestive heart failure or in-house mortality after abdominal aortic aneurysm repair). Instead of mortality, healthcare managers and researchers may be interested in performance indicators such as the number of cesarean deliveries among high-risk women,

urinary-catheter-associated infections, or postoperative sepsis. Sometimes, selection of performance indicators may be hampered by small sample size, leaving inadequate statistical power to properly assess priority outcomes.

Selection of Severity Indicators

Fundamental to risk adjustment strategies is the selection of specific indicator variables that will help healthcare managers and researchers arrive at an adequate disease severity measure. If disease severity is poorly represented, then differences in healthcare performance outcome may be inaccurately estimated.

The selection of risk adjustment variables may be made on an individual level, the hospital or organization level, or both. For example, common variables to control for at the patient level include demographic factors such as age, gender, and race. Obviously, a hospital that treats more elderly patients will likely have a high mortality rate. Examples of health status variables at the patient level include the presence of coexisting diseases such as congestive heart failure, cancer, or chronic renal failure. An example of a health status indicator at the hospital level is the all-payer, DRG-based case mix index. Socioeconomic indicators at the county level, which could help adjust for case-mix differences among organizations, may also be incorporated into adjustment models. Variables might include per capita income, unemployment rate, or college graduation rate.

Data Sources

Decisions regarding the manner in which data are collected for severity adjustment may vary. For example, it may be less costly and less time-consuming to use routinely collected data already present in a hospital's computer system. However, this type of data may be very limited in nature and have questionable accuracy, depending on the habits of individual healthcare providers within the settings of interest. For these reasons, some experts have advocated going directly to medical records to extract relevant information. However, data extraction alone for a single hospital can cost tens of thousands of dollars and may therefore be prohibitive and not worth the net gain in added precision.

Severity Adjustment Methods

There have been numerous attempts to design the most ideal disease severity adjustment method, which have resulted in a variety of commercial products that are compared and contrasted in the literature. Due to the complexities of severity adjustment, practical limitations, and the evolving nature of the field, selection of an appropriate severity measure can be difficult. Different adjustment models require different inputs. Some models use clinical information that may only be extracted from the medical record, while others may require coding data that are already available in an electronic format.

Examples of severity measurement models include Acute Physiology and Chronic Health Evaluation (APACHE III—APS), MedisGroups Score, Severity Scores on Patient Management Category Severity Scales (PMCs), Disease Staging, Charlson Severity Score, and the All Patient Refined Diagnosis Related Groups (APR-DRGs).

Daniel K. Roberts

See also Case-Mix Adjustment; Diagnosis Related Groups (DRGs); Disease; Epidemiology; Health Report Cards; Outcomes Movement; Quality of Healthcare; Risk

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- American Health Information Management Association (AHIMA): <http://www.ahima.org>
- Leapfrog Group: <http://www.leapfroggroup.org>

SHAPIRO, SAM

Sam Shapiro (1914–1999) was both a founder and an exemplar of health services research as a recognized field of inquiry in public health and medical care. He was an innovative researcher, a dedicated teacher of a generation of health services researchers, a generous mentor to younger researchers, and a valued partner in research to colleagues.

Shapiro is widely recognized for research begun in the 1960s with Drs. Philip Strax and Louis Venet that demonstrated the effectiveness of screening mammography, combined with a clinical examination, in reducing breast cancer mortality. At the time, Shapiro was director of Research for the Health Insurance Plan of Greater New York. He, Strax, and Venet initiated a clinical trial that, between 1963 and 1968, enrolled 62,000 women aged 40 to 64 who were randomly assigned screening mammography and clinical examination versus regular care. Ten years later, cumulative mortality among women randomized to screening was about 30% lower than in the regular care group. In recognition of the importance of this work, Shapiro and Strax were awarded the Charles E. Kettering Prize for outstanding contributions to cancer diagnosis or treatment in 1988. Shapiro was the first public health researcher to receive this prize.

Shapiro was born and raised in Brooklyn, New York, and attended Brooklyn College, where he earned a bachelor's degree in mathematics in 1933. In the 1934–1935 academic year, he did graduate work in mathematics and statistics at Columbia University but left to work in Home Relief, a Depression-era program in New York City. In early 1943, he went to Washington, D.C., where he worked for the Selective Service System. In 1944–1946, he served in the U.S. Navy.

After being discharged from the Navy in 1946, he joined the National Office of Vital Statistics (now the National Center for Health Statistics), a component of the Public Health Service. It was there he began his work in public health, with responsibility for birth and infant death statistics. Among his earliest published papers are several concerned with the development and completeness of birth registration data and applications of these statistical data to answer public health questions.

He spent a year (1954–1955) as senior study director at the National Opinion Research Center (NORC) in Chicago, developing research designs and questionnaires for national and local studies on health services use. He joined the Health Insurance Plan (HIP) of Greater New York in 1955 as associate director of Research and Statistics and was promoted to vice president and director of Research and Statistics in 1959.

His research at HIP focused initially on the effects of prepaid group practice on health outcomes. With Paul Densen and others, he authored two research papers in 1958 and 1960 comparing prematurity and perinatal mortality among HIP members and the general population; he reported that women in the HMO began prenatal care earlier and had lower prematurity and perinatal mortality rates and that this occurred for both White and non-White groups. Differences were also observed between women seeing private physicians and those seeing “general-service” physicians.

Concurrently with the perinatal-care work, he and Densen examined patterns of ambulatory services utilization and hospitalizations. They designed and implemented one of the very early, if not the first, routine collections of encounter data in a prepaid group practice plan to support research on patterns of service utilization. His work in mental health began with analyses of prescriptions for psychotropic medications and patterns of medical care related to mental illness. Shapiro also conducted research showing that encounters for elderly patients took more time than for adults under age 65. This provided the basis for higher capitation payments by Medicare for elderly enrollees.

Under Shapiro’s direction, HIP launched a longitudinal study of the course of newly diagnosed coronary heart disease among its members in the early 1960s, taking advantage of the plan’s enrolled population, ready access to medical records, and extensive information on procedures and treatments available from the encounter data system. Over the next 10 years or so, a number of research papers were published describing, for instance, analyses of factors associated with the incidence of myocardial infarction and angina, lifestyle changes after a diagnosis of myocardial infarction or angina, and the disease course for women as compared with men.

In March 1973, Shapiro accepted the position of director of the Health Services Research and Development Center (HSRDC) at Johns Hopkins University. During the next 9 years, he developed an interdisciplinary team of health services researchers that competed successfully for a 5-year core support grant for the HSRDC from the National Center for Health Services Research and Development and for project grants from foundations and several of the National Institutes of Health (NIH).

His own research during this period addressed several disparate topics, including surveys of defined populations in Baltimore concerning utilization of health services for chronic and preventive care; the development of statistical procedures for measuring health status in geographic areas using vital statistics and hospital discharge data; evaluation of a Maryland statewide initiative to improve blood pressure control; and, with Ellen Mackenzie, reliability testing of the Injury Severity Scale (ISS) and its underlying Abbreviated Injury Scale (AIS) for evaluating trauma injuries.

In 1974–1976, with support from the National Center for Health Statistics (NCHS), Shapiro and Richard Yaffe conducted a pilot study to assess the costs and effectiveness of alternative methodologies for obtaining survey data on medical expenditures. The results of that work influenced the design of the 1977–1978 National Medical Care Expenditure Survey (now the Medical Expenditure Panel Survey).

Continuing his interest in perinatal care issues, he undertook between 1975 and 1981, with Marie McCormick and Barbara Starfield, an evaluation of the effects of Robert Wood Johnson Foundation (RWJF)–supported regionalized networks for high-risk pregnancy care. They found that while the program’s regions did not show better outcomes than nonprogram regions, its implementation coincided with increased centralization of high-risk pregnancy care nationally so that the decrease in neonatal mortality was accompanied by a decrease in selected morbidity overall.

In 1979, Shapiro joined with Morton Kramer and Ernest Gruenberg to lead the Eastern Baltimore Mental Health Survey, one of five sites for National Institute of Mental Health’s Epidemiologic Catchment Area Survey, which developed population-based estimates for the incidence and prevalence of mental

disorders in the United States and for met and unmet needs for mental health care among people with mental disorders.

Shapiro stepped down as HSRDC director in 1982, at the age of 68, but continued his active research career, publishing more than 55 research papers and two books over the next 15 years. In 1992, at the age of 78, he began his last major investigation, with Dr. Janet Hardy. The study traced the biological and social conditions experienced by a cohort of children born at Johns Hopkins Hospital between 1960 and 1965 and assessed their status at ages 27 to 33 years with regard to their health, educational attainment, employment experience, and family formation.

In the course of his long career at Johns Hopkins University, Shapiro was advisor to a large number of students, many of whom have gone on to make major contributions in health services research. He was also a mentor to many young faculty members who are now leaders in the field in their own right.

Shapiro received many awards in recognition of his unique contributions. The American Public Health Association gave him its Award for Excellence in Promoting and Protecting the Health of People in the Domestic Field in 1977, citing the breadth and groundbreaking nature of his contributions to our knowledge of health services and their contribution to the public's health. He was elected to the national Institute of Medicine (IOM) (1974); received the Distinguished Achievement Award of the American Society of Preventive Oncology (1985); was selected to give the American Public Health Association Lowell Reed Lecture (1989); was chosen to present the 14th Wendell G. Scott Memorial Lecture of the American College of Radiology (1992); and was made an honorary fellow of the American College of Radiology (1993). Shapiro was a key participant in the formation of the Association for Health Services Research (now AcademyHealth) in 1981, in recognition of which he was given the first Distinguished Investigator Award in 1985.

Shapiro's research defined standards for preventive services and provided new epidemiologic information on major risk factors for coronary heart disease. His research on organization and finance demonstrated that HMOs could provide care of equal or better quality than the alternatives.

He developed one of the first information systems to capture utilization and diagnostic information on each physician visit and demonstrated its potential value. Today, we rely on administrative data systems that are built on this experience, including Medicare and Medicaid. One of their uses is to analyze variations in medical-practice patterns and their relationship to patient outcomes and costs as a way to identify opportunities to improve the effectiveness and efficiency of health care. His work spanned pregnancy to old age, included physical and mental health problems, focused on prevention of disease and disability, and examined alternative approaches to the organization and payment of services to ensure that those who need care receive it. His contributions to the development of this new field of knowledge, health services research, were recognized by the Johns Hopkins University in 1998 with an honorary doctorate in humane letters, "for changing the face of American health care in this half-century." Shapiro died in Baltimore in 1999 at the age of 85.

Elizabeth A. Skinner

See also Health Services Research, Origins; Mental Health Epidemiology; National Center for Health Statistics (NCHS); Preventive Care; Public Health; Robert Wood Johnson Foundation (RWJF); Starfield, Barbara; Women's Health Issues

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Web Sites

Johns Hopkins University, Health Services Research and Development Center (HSRDC):
<http://www.jhsph.edu/HSR>

SHEPS, CECIL G.

Cecil G. Sheps (1913–2004), one of the founders of the field now known as health services research, was the Taylor Grandy Distinguished Professor of Social Medicine and Epidemiology at the University of North Carolina at Chapel Hill (UNC-CH), the university's former Vice Chancellor for Health Affairs, and founding director of UNC-CH's Health Services Research Center (renamed in 1991 as the Cecil G. Sheps Center for Health Services Research), where he maintained an active presence until his death in 2004.

Sheps spent two different periods of his long career as a member of the UNC-CH faculty. He first came to Chapel Hill in 1947, shortly after having completed his public health training at Yale University. He was born and had grown up in Winnipeg, Canada, and he took his medical degree at the University of Manitoba. At UNC, he was first employed in the Office of Planning for the newly created Division of Health Affairs, and he was on the campus as the School of Medicine expanded to become a 4-year curriculum and the School of Public Health was made a distinct academic unit. He taught basic courses in public health administration, biostatistics, and epidemiology in the latter school until he departed for Boston in 1953 to become director of the Beth Israel Hospital, one of the principal teaching hospitals affiliated with the Harvard Medical School, where he held a faculty position.

In 1958, he left Boston to become professor of Public Health and head of the graduate program in medical care administration at the Graduate School of Public Health at the University of Pittsburgh. After only 5 years in that position, he was lured back into an administrative position as director of the Beth Israel Hospital in New York and as a professor at the Mount Sinai School of Medicine.

In 1968, the University of North Carolina at Chapel Hill received one of five major grants from the U.S. Public Health Service to begin a multidisciplinary center for health services research. A search for an initial director of this new center began, and several faculty members suggested that an approach be made to Sheps to return to Chapel Hill to launch this new multidisciplinary center. Sheps and his wife decided to accept separate offers to return to North Carolina, he as director of the Health Services Research Center and as professor of family medicine and she as professor of Biostatistics in the UNC School of Public Health.

Sheps had developed a keen interest in multidisciplinary problem-focused research, especially research focused on the issues of concern to the field of healthcare. He had formed a multidisciplinary unit to carry out this sort of research at Beth Israel in Boston, one of the first hospital-based research institutes of its kind. Several of the investigators he attracted to work in that unit later became the leading figures in the emerging field of health services research, a field he helped to create and name. He was the first chairperson of the initial study section of the U.S. Public Health Service, giving grants to support the work of scholars in what was then called healthcare studies.

Sheps believed that the problems in assuring access to quality medical care for everyone were surmountable. He believed that one of the challenges of health services was to discover ways of converting an array of disconnected healthcare services into coherent and consumer/patient-centered programs of healthcare serving defined populations by offering clearly defined and needed care.

Throughout his career, Sheps had a strong interest in international healthcare issues and in the development of both research and educational programs addressing healthcare issues. He traveled and was actively involved in health services research in the United Kingdom, and he was one of the consultants involved over a number of years in the

development of a new community-oriented medical school at Ben Gurion University of the Negev in Israel.

Sheps published over 140 articles in scientific journals and wrote or edited nine books, including *Needed Research in Health and Medical Care: A Biosocial Approach* with Eugene E. Taylor and *The Sick Citadel: The American Academic Medical Center and the Public Interest* with Irving J. Lewis. Sheps passed away on February 7, 2004.

Gordon H. DeFries

See also Academic Medical Centers; Access to Healthcare; Comparing Health Systems; Epidemiology; Health Planning; Health Services Research, Origins; International Health Systems; Public Health

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Web Sites

University of North Carolina at Chapel Hill, Cecil G. Sheps Center for Health Services Research:
<http://www.shepscenter.unc.edu>

United States, Stephen M. Shortell has had a very productive and influential career. His groundbreaking, interdisciplinary research projects have sought to identify and understand the interactions among business strategies, organizational structures, quality improvement processes, and performance of healthcare systems. One important outcome of Shortell's research has been a typology of healthcare systems alliances. His research also has focused on organizational attributes of physician group practices, with an ongoing interest in quality, outcomes of care, and strategic alliances between physicians and other healthcare entities. Woven throughout his ongoing program of research are questions about the effectiveness of total quality management (TQM), strategic change in the healthcare sector, and ways to enhance community-based initiatives to improve health. At the heart of his scholarly and intricate studies is a concern for improving the organization of health services as a means to improve the health of populations.

After receiving his bachelor's degree in business from the University of Notre Dame, Shortell completed a master of public health degree from the University of California at Los Angeles. Next, he received a master of business administration and a doctoral degree in behavioral science from the University of Chicago. In 1998, Shortell became dean of the University of California, Berkeley, School of Public Health; Blue Cross of California Distinguished Professor of Health Policy and Management; and a professor of Organization Behavior at the Haas School of Business. He concurrently holds appointments in the Department of Sociology at Berkeley and the Institute for Health Policy Research at the University of California, San Francisco. For the 16 years prior to arriving at Berkeley, Shortell was A. C. Buehler Distinguished Professor of Health Services Management in the Kellogg Graduate School of Management at Northwestern University.

Over his long career, Shortell has received numerous distinguished awards for his various contributions. He received the Baxter-Allegiance Prize for innovative research and the Gold Medal from the American College of Healthcare Executives (ACHE). He was elected to the National Academy of Sciences, Institute of Medicine (IOM), in 1986 and served two terms on the Governing Council. He has served as editor-in-chief of *Health Services*

SHORTELL, STEPHEN M.

A highly distinguished scholar and well-respected leader in health services delivery systems in the

Research, president of the Association for Health Services Research, and chair of the Accrediting Commission for Graduate Education in Health Services Administration. More recently, Shortell was a fellow at the Center for Advanced Study in the Behavioral Sciences at Stanford University. He has received three “Book of the Year” awards from professional associations ranging from the American Nurses Association to the Academy of Management. The textbook Shortell wrote with Arnold D. Kaluzny is now in its fifth edition. It was one of the first textbooks written specifically for health services managers and researchers.

The extent of Shortell’s accomplishments is a testament to both his keen intellect and his ready willingness to engage with others in the pursuit of knowledge.

L. Michele Issel

See also Healthcare Organization Theory; Health Services Research Journals; Hospitals; Medical Sociology; Multihospital Healthcare Systems; Physicians; Public Health; Public Policy

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Web Sites

University of California, Berkeley Haas School of Business Faculty Profile: <http://www.haas.berkeley.edu/faculty/shortell.html>

University of California, Berkeley School of Public Health Faculty Profile: <http://sph.berkeley.edu/faculty/shortell.html>

SHORT-FORM HEALTH SURVEYS (SF-36, -12, -8)

The Short-Form Health Survey (SF-36) is a generic, multipurpose, 36-item survey that is widely used to measure the health status of general and specific populations for a variety of purposes. Specifically, the SF-36 survey instrument measures eight health domains, including the following: general health, physical functioning, role limitations due to physical health problems, role limitations due to emotional problems, social functioning, bodily pain, vitality, and mental health. The survey is usually self-administered and takes only 5 to 10 minutes to complete. Shorter versions of the SF-36 are available. The SF-36 has been translated into dozens of languages, and its use has been documented in thousands of published studies. Applications of SF-36 include comparing and evaluating health outcomes related to specific medical treatments, estimating and/or comparing the burden of different disease states, and comparing health status over time.

Survey Development

Most of the items used in the SF-36 have evolved from other survey instruments applied over several decades, but its immediate roots can be traced to the development of a 149-item Functioning and Well-Being Profile (FWBP) developed by researchers

involved in the RAND Corporation's Health Insurance Experiment (HIE) and Medical Outcomes Study (MOS). The 149 items used in the FWBP were taken and modified from a variety of other survey instruments, including the General Psychological Well-Being Inventory and the Health Perceptions Questionnaire. An initial version of the SF-36, the SF-20, was published in 1988 but received criticism for being too short and lacking sensitivity to health status changes. The SF-20 was therefore transformed into the SF-36, which has withstood considerable evaluation and scrutiny since then.

The SF-36 is currently published and coordinated by QualityMetric, Inc., a company that develops and markets patient-reported outcome instruments that measure health-related quality of life. The company publishes several manuals that contain detailed information pertaining to the survey's administration and scoring, as well as comparisons with other tools.

Due to time and cost constraints on the amount of data that can be collected for many studies, even shorter versions of the SF-36 have been developed that provide acceptable degrees of information for certain applications. The SF-12, a 12-item survey that fits on a single page, consists of a subset of the SF-36. Although it improves efficiency and lowers research costs, the shorter survey has limitations. Similarly, the 8-item SF-8 also has limitations, and it may be used in lieu of the SF-36 and SF-12.

Description and Content

The SF-36 contains 11 numbered sections, some of which have multiple items (Table 1). Each "item" is essentially a specific question; therefore, as the survey's name implies, there are 36 total questions or items that address eight health domains. Depending on needs and preferences, some variation may be applied to the scoring and analysis of the SF-36. The fundamental information provided, though, consists of two sets of scores, including eight individual domain scores and two summary scores. One summary score is calculated for the "physical health component" function and the other for the "mental health component." The physical health component summary score is derived from the physical-functioning domain, the role limitation due to

physical health domain, the bodily pain domain, and the general health domain. The mental health component summary score is derived from the general mental health domain, the vitality domain, the role limitation due to emotional problems domain, and the social-functioning domain.

All the items in the current version of the survey instrument (SF-36 Health Survey Version 2.0) have three or more Likert Scale responses (i.e., data that are categorical in nature yet have a hierarchical sequence). For example, for the question that asks how much pain the individual has experienced during the past 4 weeks, the possible ordered responses are "none," "very mild," "mild," "moderate," "severe," and "very severe." This type of question format provides more data than the older version of SF-36, which used simple "yes" and "no" responses. And the greater number of response categories in lieu of the dichotomous response options has resulted in greater measurement precision as well as a reduction in "floor" and "ceiling" effects whereby the survey instrument may fail to differentiate responses at the margins.

Although the SF-36 contains eight of the health domains most frequently used in other popular surveys, symptoms and problems connected to a specific medical condition are not included among the questions. Thus, it does not encompass content areas such as self-esteem, sleep adequacy, and cognitive functioning.

Survey Administration

The overall purpose of the SF-36 is to measure aspects of a person's health for those 14 years of age or older in a manner that is relatively comprehensive and from the individual's perspective. It is also intended to be brief. The survey instrument is designed to be self-administered, but it may also be administered through face-to-face or telephone interview. Computerized administration is also possible. When the survey is administered, individuals are not "coached," or provided with advice relative to its interpretation. Rather, instructions are limited to those printed on the survey. If any assistance is required, due to poor visual acuity, for example, it is limited to reading the survey verbatim.

Table 1 Short-Form 36 Health Survey

Your Health and Well-Being

This survey asks for your views about your health. This information will help keep track of how you feel and how well you are able to do your usual activities. *Thank you for completing this survey!*

For each of the following questions, please mark an X in the one box that best describes your answer.

1. In general, would you say your health is:

Excellent	Very good	Good	Fair	Poor
▼	▼	▼	▼	▼
<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5

2. Compared to one year ago, how would you rate your health in general now?

Much better now than one year ago	Somewhat better now than one year ago	About the same as one year ago	Somewhat worse now than one year ago	Much worse now than one year ago
▼	▼	▼	▼	▼
<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5

3. The following questions are about activities you might do during a typical day. Does your health now limit you in these activities? If so, how much?

Yes, limited a lot	Yes, limited a little	No, not limited at all
▼	▼	▼

- a. Vigorous activities, such as running, lifting heavy objects, participating in strenuous sports 1..... 2..... 3
- b. Moderate activities, such as moving a table, pushing a vacuum cleaner, bowling, or playing golf 1..... 2..... 3
- c. Lifting or carrying groceries 1..... 2..... 3
- d. Climbing several flights of stairs..... 1..... 2..... 3
- e. Climbing one flight of stairs..... 1..... 2..... 3
- f. Bending, kneeling, or stooping 1..... 2..... 3
- g. Walking more than a mile 1..... 2..... 3
- h. Walking several hundred yards..... 1..... 2..... 3
- i. Walking one hundred yards..... 1..... 2..... 3
- j. Bathing or dressing yourself 1..... 2..... 3

4. During the past 4 weeks, how much of the time have you had any of the following problems with your work or other regular daily activities as a result of your physical health?

	All of the time	Most of the time	Some of the time	A little of the time	None of the time
	▼	▼	▼	▼	▼
a. Cut down on the <u>amount of time</u> you spent on work or other activities	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
b. <u>Accomplished less</u> than you would like	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
c. Were limited in the <u>kind</u> of work or other activities	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
d. Had <u>difficulty</u> performing the work or other activities (for example, it took extra effort)	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5

5. During the past 4 weeks, how much of the time have you had any of the following problems with your work or other regular daily activities as a result of any emotional problems (such as feeling depressed or anxious)?

	All of the time	Most of the time	Some of the time	A little of the time	None of the time
	▼	▼	▼	▼	▼
a. Cut down on the <u>amount of time</u> you spent on work or other activities	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
b. <u>Accomplished less</u> than you would like	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
c. Did work or other activities <u>less carefully than usual</u>	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5

6. During the past 4 weeks, to what extent has your physical health or emotional problems interfered with your normal social activities with family, friends, neighbors, or groups?

Not at all	Slightly	Moderately	Quite a bit	Extremely
▼	▼	▼	▼	▼
<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5

7. How much bodily pain have you had during the past 4 weeks?

None	Very mild	Mild	Moderate	Severe	Very Severe
▼	▼	▼	▼	▼	▼
<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6

8. During the past 4 weeks, how much did pain interfere with your normal work (including both work outside the home and housework)?

Not at all	A little bit	Moderately	Quite a bit	Extremely
▼	▼	▼	▼	▼
<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5

Table I (Continued)

9. These questions are about how you feel and how things have been with you during the past 4 weeks. For each question, please give the one answer that comes closest to the way you have been feeling. How much of the time during the past 4 weeks...

	All of the time	Most of the time	Some of the time	A little of the time	None of the time
	▼	▼	▼	▼	▼
a. Did you feel full of life?.....	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
b. Have you been very nervous?.....	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
c. Have you felt so down in the dumps that nothing could cheer you up?.....	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
d. Have you felt calm and peaceful? ...	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
e. Did you have a lot of energy?.....	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
f. Have you felt downhearted and depressed?.....	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
g. Did you feel worn out?.....	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
h. Have you been happy?.....	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
i. Did you feel tired?.....	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5

10. During the past 4 weeks, how much of the time has your physical health or emotional problems interfered with your social activities (like visiting friends, relatives, etc.)?

All of the time	Most of the time	Some of the time	A little of the time	None of the time
▼	▼	▼	▼	▼
<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5

11. How TRUE or FALSE is each of the following statements for you?

	Definitely true	Mostly true	Don't know	Mostly false	Definitely false
	▼	▼	▼	▼	▼
a. I seem to get sick a little easier than other people.....	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
b. I am as healthy as anybody I know	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
c. I expect my health to get worse	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
d. My health is excellent.....	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5

THANK YOU FOR COMPLETING THESE QUESTIONS!

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When using the SF-36 to measure health status repeatedly over time, the standard form is designed for a 4-week recall. An acute (1 week) recall version is also available when it is desirable to measure health status weekly or biweekly. The 1-week recall version is more sensitive to recent changes in health status than the standard 4-week recall version. The 1-week recall form was created by changing the words “in the past four weeks” to “in the past week” in the health domain questions for which this is applicable.

Scoring the Survey

As with many other survey instruments, although the raw recorded data may appear straightforward initially, there are important considerations, and choice of analysis method may depend on the specific applications. There are many considerations, including whether health status is being compared among different populations or within the same population over time. Detailed manuals are best consulted for in-depth explanations and scoring options. Computer software is also available to assist with scoring, but expertise is required nonetheless.

Fundamental to the SF-36 is that it yields eight scale scores, one for each health domain, and two summary scores, one being a physical component score (PCS) and the other a mental component score (MCS). An initial step in the process of scoring requires some transformation of the data such that “better health” is represented by consistently higher values (on the original survey form, the numeral 1 may correspond to the “best” health response or the “worst” health response). Each item is then scored on a 0 to 100 scale such that the score 0 represents the poorest health option and 100 represents the best health option. Thus, an item’s answer represents the percentage of the maximum achievable score. Because the intervals in a Likert Scale are not typically proportional, an item that has five possible responses cannot simply be assigned 0, 25%, 50%, 75%, and 100%.

Instead, special weights that have been determined from Likert analyses must be used.

Domain scores are calculated by using averaging methods of the scores from each domain’s relevant items. Similarly, the summary scores (i.e., the PCS and the MCS) are derived using averaging methods applied to the relevant domain scores. During the scoring process, unanswered items may simply be ignored altogether while averaging a domain’s remaining items, but this can be handled in several different ways. Commercial software designed specifically for the survey instrument can be used to create imputed values to replace “missing” data if desired.

To make it easier to compare the eight domain scores, different populations, and survey results acquired using the SF-36, Version 2.0, with published results using the SF-36, Version 1.0, norm-based scoring algorithms were developed that yield standardized scores (with a mean score of 50 and a standard deviation of 10). This type of standardization allows an interpretation such that scores 0 to 49 are below average and scores 51 to 100 are above average.

Reliability and Validity

Developing an in-depth understanding of the reliability and validity of the SF-36 is complex, and assistance from someone familiar with the voluminous SF-36 literature and with expertise in survey research is desirable. Although the appropriateness of the short-form surveys must be considered in relation to specific applications, the survey instruments are generally both reliable (yield consistent results) and valid (accurately measure what is being tested). Numerous studies, using both internal consistency and test-retest methods, support the reliability of the eight health domain scores as well as the two summary measures. In particular, the physical and mental summary scores usually have exceeded median reliability coefficients. Reliability trends have been found to span many different sociodemographic groups and medical diagnoses.

Systematic comparisons of the SF-36 content validity with that of other widely used surveys show that the health domains addressed are some of the most frequently used for similar purposes. There are many different health domains, or

content areas, that are used in other surveys, but the SF-36 is designed to be a nonspecific, generic health survey. Thus, it will not indicate condition-specific problems, nor should it be expected to do so, because of its general nature.

Shorter Versions of the Survey

Both the SF-12 and SF-8 were developed as shorter alternatives to the SF-36. Having these shorter survey instruments to measure health status in a manner that is reasonably as accurate as the SF-36 is frequently necessary when there is a need to also collect other information that adds to cumulative testing time.

The initial version of the SF-12 was published in 1995, and it has been widely used. It contains only 12 items extracted from the SF-36, it fits on one page, and it takes only about 2 minutes to complete. Each of the eight health domains is addressed with only one or two items. Similar to the SF-36, the SF-12 has evolved so that all items have more than just a “yes” or “no” response, and this has improved the possible conclusions from the survey. Version 1.0 of the SF-12 was developed so that two summary scores, the PCS and the MCS, could be calculated with about 90% of the accuracy of the SF-36.

The SF-8, the shortest questionnaire, has only one item for each of the eight health domains. Unlike the SF-12, the SF-8 has only one item that has the same language as the SF-36. Scores from the SF-8 can be compared directly with scores from other SF surveys. Similar to the SF-36, the SF-8 is available in 1-week and 4-week recall formats. The SF-8 has also been modified into a 24-hour recall format.

Daniel K. Roberts

See also Disability; Disease; Health; Health Indicators, Leading; Health Surveys; Measurement in Health Services Research; Quality of Life, Health Related; Ware, John E.

Further Readings

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Web Sites

Agency for Healthcare Research and Quality (AHRQ): <http://www.ahrq.gov>

QualityMetric, Inc.: <http://www.qualitymetric.com>

RAND Corporation: <http://www.rand.org>

SINGLE-PAYER SYSTEM

The term *single-payer system* refers to any health-care scheme in which a sole source of funding provides payments to physicians, hospitals, laboratories, and other providers for services rendered to patients. While healthcare reform advocates often propose single-payer systems as a means to achieve universal healthcare, the terms should not be considered synonymous. Single-payer systems may serve patients grouped by government constituency (e.g., national citizens or state citizens) or by patient community. By this standard, the U.S. government currently manages several single-payer systems, including Medicare, for individuals 65 years of age and older, and the Veterans Health Administration (VHA), for eligible armed services veterans.

The payer in such a system may be a government entity or other designated insurance organization. But typically, when policy analysts refer to the United States moving to a single-payer-based healthcare system, they envision a system of national health insurance, implemented similarly to the system currently employed in Canada. Canada’s national health insurance scheme works according to a federal model, with mandates and guidelines set by the national government; it is implemented and provided by the individual provincial governments. Just as in the United States, Canada’s healthcare providers exist as a mix of

public, private not-for-profit, and for-profit, investor-owned organizations. Approximately 70% of Canada's healthcare expenditures run through its national health insurance plan, with the remaining expenditures made up of out-of-pocket costs and supplementary private insurance payments.

Canada's system originated with provincial-level programs, starting with Saskatchewan in 1946, and some advocates have proposed a similar approach to instituting single-payer systems in the United States. To date, state legislatures have evaluated proposals for state-level single-payer systems in California, Oregon, Massachusetts, and Illinois. Of these, only one bill, the 2006 Health Care for all Californians Act, passed the state legislature, but it went down to veto by California's Governor Arnold Schwarzenegger.

Advantages

Advocates of a single-payer approach to reforming the U.S. healthcare system point to several assumed advantages, chiefly cost reductions through administrative efficiency and bargaining power; increased access to insurance and healthcare; and improved healthcare quality and outcomes.

Approximately 31% of U.S. healthcare spending goes to overhead costs and profits. In contrast, Canada's national health insurance program spends a little more than 1% of its budget on overhead, and in the United States, the federal government keeps Medicare's administrative costs to less than 4% of the total spending. U.S. hospitals devote roughly one quarter of their budgets to administration and billing, while Canadian hospitals only spend about half as much for the same functions. In theory, a single-payer system would enable these savings on a nationwide basis. Policy analysts speculate that further cost reductions would come from the bargaining power a nationalized insurance plan would have to negotiate prices with service providers, drug companies, medical-device makers, and other suppliers.

While single-payer systems need not require individual coverage, most proposals for implementing national health insurance in the United States include either mandates or strong economic incentives to include as many persons in the pool as possible. Advocates of this approach point to lower costs of entry for individuals, as

well as reduced costs for those people currently insured, by virtue of enlarging the risk pool. The resulting equality of coverage should break down many of the current barriers to care experienced in the United States, particularly by persons of lower socioeconomic status, persons at high risk for disease or injury, and other populations that have trouble securing insurance, such as the self-employed.

With the massive spending outlays on billing and administration by hospitals and other healthcare providers comes a great drain on human resources. Advocates of the single-payer approach highlight the amount of time spent by U.S. physicians dealing with insurance paperwork and bureaucracy and suggest that moving to a simplified national insurance program would free providers to spend more time with their patients, improving quality of care.

Disadvantages

Even some advocates of single-payer systems criticize the Canadian model as preserving what both they and some critics see as a problematic fee-for-service delivery model. By itself, implementing the single-payer system in the United States would do nothing to address the broader quality-of-care issues that many analysts link to fee-for-service delivery.

More specifically, opponents of single-payer systems often argue against them on broad economic or philosophical grounds that sometimes have more to do with the means than the ends of such reform proposals. But in terms of the specifics of implementing a single-payer system in the United States, critics identify some potential pitfalls: healthcare rationing, insufficient redress of healthcare inequality, illusory cost savings, and the general repercussions of reducing competition in healthcare.

Many single-payer system plans operate on a global budget, specifying a maximum government outlay for healthcare during a given year. To remain within those budgets, countries such as Canada enforce limitations on resources, such as the number of appointments available, and on implementation of expensive technology, such as magnetic resonance imaging scanners. Opponents note that for the covered population, these limitations can

result in increased waiting times for nonemergency services and noncoverage of some services readily available in third-party-payer systems.

Despite assertions that a single-payer model would address health disparities, critics point out that even in nations with single-payer-based universal coverage, serious health disparities remain. One study, for example, found that Canada's system increased access to psychiatric services for persons in higher socioeconomic groups with lower morbidity while failing to address the needs of persons in lower socioeconomic groups with greater need for care.

Opponents of single-payer models argue that the cost savings seen in existing systems do not represent true savings but actually cost-shifting from patients and payers to caregivers and vendors. In other words, if a single-payer entity negotiates the fee for a service from \$1000 down to \$750, the payer may "save" \$250, but this transaction "charges" the provider \$250, leaving the social cost the same.

Finally, critics of single-payer systems suggest that reducing competitive payment from the U.S. healthcare system will ultimately harm patients by eliminating incentives for providers to compete through lower fees, increased convenience, and innovations in products and services. These policy analysts offer examples such as Lasik surgery and fee-based telephone physician consultation as the types of services that would not emerge and thrive under a monopolistic single-payer model.

Future Implications

With growing healthcare costs, swelling ranks of the uninsured, and increased global competition, few policy analysts would argue that the U.S. healthcare system does not require some kind of intervention and reform. But like so many issues of national policy, the question of whether or not to implement a single-payer system hinges on political and philosophical questions at least as much as questions concerning its potential economic and social impact. Most opponents of a single-payer system favor market-based solutions that minimize government's role in healthcare. In many ways, single-payer versus market reforms perfectly represents the broader fault lines in American politics.

For decades, policymakers have tried to sidestep the broader questions embedded in the healthcare debate by implementing incremental changes that both expand government's role as single payer for some populations (e.g., as in Medicare Part D) and use incentives to make healthcare more like traditional markets (e.g., as in health savings accounts). But while few analysts seriously propose eliminating government's role as a payer entirely, advocates on both sides of the debate increasingly acknowledge that these incremental, balanced approaches do not yield satisfactory results. At the same time, despite a growing sense of crisis about U.S. healthcare, observers find scant evidence that the political will exists to fully embrace either approach.

Despite the growing size and power of its national government, the United States remains a federalist nation. Just as Canada's national health insurance system originated in a single province, one or more U.S. states may pass single-payer legislation and thus serve as laboratories for a single-payer experiment. Success on the state level could well lead to a national tipping point for the single-payer system or, in the event of failure, a backlash favoring market-based solutions.

Jason Rothstein

See also Cost of Healthcare; Equity, Efficiency, and Effectiveness in Healthcare; Healthcare Financial Management; Health Insurance; Health Services Research in Canada; International Health Systems; National Health Insurance; State-Based Health Insurance Initiatives

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Web Sites

American Medical Student Association (AMSA):
<http://www.amsa.org>

National Association of Health Underwriters (NAHU):
<http://www.nahu.org>

Physicians for a National Health Program (PNHP):
<http://www.pnhp.org>

Single Payer Now: <http://www.singlepayernow.net>

SKILLED-NURSING FACILITIES

Skilled-nursing facilities play a vital role in the continuum of healthcare services, providing care in one of the most intensive healthcare settings outside hospitals. Skilled-nursing facilities meet the short-term care needs of individuals with intensive medical and rehabilitation needs or needs for hospice or respite services, and they provide more continuous long-term care for persons with disabilities, chronic conditions, and custodial care needs. For individuals with short-term care needs, skilled-nursing facilities play a transitional role in facilitating care that is less intensive than that provided in acute care settings and more intensive than care provided at home. For individuals with long-term care needs, skilled-nursing facilities provide services that may be rendered until the end of their lives.

The Nature of These Facilities

A skilled-nursing facility is a specific category of nursing home. A nursing home is defined as an establishment of three or more beds that provides individual care and services to the aged, infirm, and chronically ill. Nursing homes are licensed institutions that have the option to pursue

additional certification as skilled-nursing facilities. Nursing homes without skilled-nursing facility certification provide a less intensive, custodial level of care. Skilled-nursing facilities may be either independent, freestanding facilities or distinct units within a larger nursing home, hospital, continuing-care retirement community, or long-term care hospital.

There are approximately 15,000 skilled-nursing facilities throughout the United States. The majority of these facilities are proprietary (for-profit), followed by not-for-profit facilities, with the smallest number of facilities being government owned. Regardless of ownership, most skilled-nursing facilities are affiliated with a chain, while a smaller number are independent facilities. The majority of skilled-nursing facilities in the nation are located in the Midwest and South. And most facilities are located in metropolitan areas. The average size of these facilities is about 100 beds. Most skilled-nursing facilities are certified by both Medicare and Medicaid, although a small number of them are certified by only Medicare. Smaller facilities and those certified by only Medicare are often designated distinct units within larger institutions such as hospitals.

Problems

While the number of skilled-nursing facilities in the nation has been on the rise, the overall occupancy rate of these facilities has been declining. The decline in occupancy rate is the result of shorter lengths of stay and alternative options for care. Shorter lengths of stay are spurred by many factors, including changes in financing mechanisms and advances in medical treatment. Consumer interests, changes in financing mechanisms, and the development of various technologies are creating alternative options of care. Alternative settings to nursing facilities include the patient's home (in-home care), assisted living and supportive living facilities, and continuing care retirement communities.

Criteria for Care

Most individuals who are admitted to skilled-nursing facilities for short-term transitional needs

must meet the criteria established by Medicare, private health insurance companies, and/or the states. The criteria individuals must meet under Medicare and insurance companies typically include medically necessary nursing and therapy services provided by a licensed practitioner such as a physical, occupational, respiratory, or speech therapist or a licensed, vocational, or registered nurse. These services must be ordered by a physician and initiated and executed within specific time frames. With the qualifying criteria met, Medicare will pay for services rendered in a certified skilled-nursing facility; however, this benefit is limited to 100 days and may be discontinued prior to 100 days if the individual no longer meets the qualifying criteria. Financial coverage through private health insurance companies follows similar guidelines; however, the full extent of the coverage is specific to each individual insurance policy.

Individuals may be admitted to a skilled-nursing facility and not meet the qualifying criteria for coverage through Medicare or private health insurance. They may continue to live in a skilled-nursing facility after they no longer meet the qualifying criteria for financial coverage under Medicare or private insurance. They may also no longer meet qualifying coverage because they have exhausted their coverage benefit or because they no longer demonstrate a need that qualifies them for coverage.

Qualifying criteria associated with long-term care in a skilled-nursing facility vary from state to state. The criteria may correlate to payment for skilled-nursing facility care under the individual state's Medicaid payment program. This criterion often uses two variables associated with an individual's capacity in the areas of cognition and independence. An individual is scored to have a qualifying level of cognitive impairment through the administration of various tests, such as the Folstein Mini-Mental State Examination (FMSE). Criteria that measure an individual's independence are typically scored through the Activities of Daily Living (ADL) or the Instrumental Activity of Daily Living (IADL). These tests measure an individual's level of independence in a number of categories, including bathing, grooming, ambulation, shopping, and housekeeping.

Services Provided

Skilled-nursing facilities may provide a wide range of services. These services may be organized into dedicated units within the facility or offered as standard levels of care throughout the facility. These services may include intensive nursing care associated with ventilator care; intensive rehabilitation associated with postacute, postsurgical, or neurological needs; and complex medical care emphasizing the intensive combination of both nursing and rehabilitation. These varieties of highly skilled care may be referred to as subacute care. Skilled-nursing facilities may also offer specialized services for persons with Alzheimer disease, those in need of hospice care, or persons with respite-care needs. Other services provided include education of the individual patient and family, meals, medications, social services, activities, and dietary consultation.

As skilled-nursing facilities become more competitive and occupancy rates continue to decline, they are increasingly looking toward specialization in one or more of these services, to maintain or develop a position in the marketplace.

Future Implications

Skilled-nursing facilities play an important role in the delivery of healthcare services in the nation. They provide some of the most intensive settings for medical care outside hospitals. Providing both short-term and long-term care, skilled-nursing facilities meet the transitional needs of individuals who require care between the hospital and their home. They also play an important role in the provision of long-term care for individuals who are cognitively impaired or are dependent in a significant number of activities of daily living. A number of financing mechanisms pay for care in a skilled-nursing facility; however, individuals must often meet qualifying criteria to be admitted to the facility. As the need for skilled-nursing facilities evolves, more of them are developing specialized services or units focusing on specific conditions, treatments, and services.

Kimberly R. Clawson

See also AARP; Access to Healthcare; Long-Term Care; Health Insurance; Medicaid; Medicare; Nursing Home Quality; Nursing Homes

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- Centers for Medicare and Medicaid Services (CMS):
<http://www.cms.hhs.gov/center/snf.asp>

STARFIELD, BARBARA

Barbara Starfield is an internationally recognized health services researcher who is known for her work in primary care. She has devoted much of her career to studying the role and impact of primary care on health systems and the health of populations. She is also a strong advocate for the greater use of primary care as a way to improve quality and lower healthcare costs. Many of her publications are seminal works in the field. Two of her best-known publications are *Primary Care: Concepts, Evaluation, and Policy* and *Primary Care: Balancing Health Needs, Services, and Technology*.

Born and raised in New York City, Starfield earned her bachelor's degree from Swarthmore College in 1954, her medical degree from the State University of New York (through the Health Sciences Center in Brooklyn) in 1959, and her master of public health degree from Johns Hopkins University in 1963.

Starfield has been at Johns Hopkins University for most of her career. From 1959 to 1963, she was a fellow in the pediatrics department at the university's medical school. From 1963 to 1966,

she was an instructor in the pediatrics department and medical director of the pediatric medical care clinic. From 1966 to 1975, she was a professor in the department of medical care and hospitals at the university's School of Public Health. From 1975 to 1994, she was the head of the Division of Health Policy in the Department of Health Policy and Management. She is now University Distinguished Service Professor in the Department of Health Policy and Management and director of the Primary Care Policy Center at Johns Hopkins University.

Starfield is a prolific researcher and writer. She has authored or coauthored over 200 journal articles, 15 books and monographs, and 57 book chapters.

In recognition of her work, Starfield has received numerous awards and honors. She has been a member of the National Academy of Sciences, Institute of Medicine (IOM) since 1977. She received the Distinguished Investigator Award from the Association of Health Services Research in 1996 and the Baxter International Foundation Prize for Health Services Research from the Association of University Programs in Health Administration (AUPHA) in 2004. She was awarded the John G. Walsh Award for Lifetime Contributions to Family Medicine by the American Academy of Family Physicians (AAFP), and she received an honorary doctoral degree from the University of Montreal in 2005. She received the Annual Award for Excellence and Innovation and Value Purchasing from the National Business Group on Health and the Avedis Donabedian Award for Quality Improvement from the American Public Health Association in 2007.

Starfield was the cofounder and first president of the International Society for Equity in Health, a scientific society devoted to equity in the distribution of health care services.

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See also Community Health; Equity, Efficiency, and Effectiveness in Healthcare; Physicians; Primary Care; Primary Care Physicians; Public Health; Public Policy

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STARR, PAUL

Paul Starr is a noted professor of sociology and public affairs at Princeton University, where he holds the Stuart Chair in Communications and Public Affairs at the Woodrow Wilson School of Public and International Affairs. Starr was awarded the Pulitzer Prize for Nonfiction and the Bancroft Prize in American History in 1984 for his book *The Social Transformation of American Medicine*. This seminal work details the history of the nation's healthcare system over the past centuries. The book stimulated many scholars and students in history, political science, and public health to take stock of medicine's historical and future directions.

The Social Transformation of American Medicine documents the transformation of the nation's healthcare from a household service to one that has become dominated by market forces and the emergence of private medical practice. In the book, Starr details the institutionalization and professionalization of American medicine and the rise in influence of the medical profession and its authority over healthcare. He elaborates how physicians have

been able to exert their control over almost every aspect of the healthcare system and how hospitals have served as the medical workshops of physicians, subsidized by various government programs. As a result of the dominance of physician control, healthcare costs have risen dramatically, and the public has become increasingly frustrated. This also has led to corporate conglomerates exerting greater influence over the burgeoning healthcare system.

Starr also authored the book *The Logic of Health Care Reform*, which advocated a national health insurance system and managed competition based on President Clinton's healthcare reform proposal. During 1993, Starr served as a senior advisor to the White House and was the chief architect of the Clinton administration's proposed healthcare reform plan. Starr laid out a variation of a managed-competition scheme to cover all Americans, regardless of employment status or pre-existing conditions, which was to be funded through employer contributions and government subsidies.

Starr has published extensively on issues in politics, American society, and domestic and foreign policy. His most recent book, *Freedom's Power: The True Force of Liberalism*, argues that modern democratic liberalism is the only viable solution to the challenges confronting our modern society. Starr also is the coeditor of *The American Prospect*, a liberal monthly magazine about politics, policies, and ideas that he cofounded in 1990 along with Robert Kuttner and Robert Reich.

Starr previously served as the project director for the Center for the Study of Responsive Law from 1971 to 1972, and he was the director of the Century Institute from 1999 to 2003. Starr was assistant professor of sociology from 1978 to 1983 and associate professor of sociology from 1983 to 1985 at Harvard University. He received his bachelor's degree in 1970 from Columbia University and a doctoral degree in sociology from Harvard University in 1978. Starr also received in 1986 an honorary Doctor of Humane Letters from the State University of New York.

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See also American Hospital Association (AHA); American Medical Association (AMA); Hospitals; Medical Sociology; National Health Insurance; Nurses; Physicians; Public Policy

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STATE-BASED HEALTH INSURANCE INITIATIVES

Many states in the nation, including Illinois, Maine, and Massachusetts, have created state-based health insurance initiatives to expand coverage. These state-based initiatives have incrementally expanded existing health insurance programs as well as created new programs. Their varied attempts have resulted in equally varied results and outcomes. These varied outcomes mirror the states' diverse populations and situations. Their successes have been limited by federal laws, financial constraints, and political wills.

In 2006, approximately 47 million Americans, or about one in six residents, did not have health insurance coverage. Nationally, 15.8% of the population were uninsured, but the variation across states ranged from a low of 8.5% for Minnesota to a high of 24.1% for Texas. Individuals without health insurance receive no care, inadequate care, or care paid for by a third party such as the government, a charity, or involuntary subsidy. Inadequate healthcare often means more expensive care. Healthcare for the uninsured is

often delivered after a disease has progressed, when the disease is more difficult and expensive to treat. Preventive healthcare is likely to be the first type of care that uninsured people do without. When uninsured Americans finally do receive healthcare, other citizens and businesses ultimately pay for the cost of that care.

Individuals, businesses, and governments all have incentives to create an efficient and equitable health insurance coverage system. The federal government addresses this problem through several insurance entitlements and funding mechanisms. However, the federal government programs have not been able to provide all Americans with guaranteed health insurance. The unmet cost of healthcare for these uninsured Americans then falls to local charities and governments, and these entities have tried to meet this demand.

Many states are attempting to expand healthcare coverage in spite of the continued rise in the cost of health insurance and the decline in employer-sponsored health insurance coverage. The health insurance landscape creates many challenges. The states themselves, faced with budgetary constraints, political interest groups, and federal regulations, find their attempts to provide health insurance difficult. No state has been able to provide universal health coverage. In addition to the financial and political hurdles the states must face, they must also conform to federal laws. And federal law prevents them from mandating businesses to provide health insurance benefits.

Health Services Research Issues

State-based health insurance initiatives must address three health services research issues: access, cost, and quality of care. However, access issues have been their primary focus. State-based initiatives have mainly attempted to expand health insurance coverage through improved financing (increasing state funds) and lowering the cost of health insurance premiums. Funds for these goals can come from state taxes or from federal government programs and grants.

Access

State governments can increase access to healthcare by expanding eligibility to state-sponsored

health insurance (largely Medicaid and State Children's Health Insurance Programs, or SCHIP). They can encourage employee-sponsored insurance by providing subsidies to businesses that offer it or by providing premium assistance to employees who elect to take the insurance. The states can modify eligibility rules, and they also can attempt to increase access by lowering the costs of health insurance premiums. Lower health insurance premiums may increase the number of people who opt to purchase insurance.

Cost

Many states have attempted to lower the cost of health insurance by creating high-risk pools that organize high-risk individuals (individuals with preexisting medical conditions, individuals employed in small businesses, and others) into larger groups, thereby spreading the risk of insurance across the larger group of people. These high-risk pools do require higher premiums, but they provide insurance access that would otherwise not exist. The states have also provided liability protection to insurance companies (reinsurance) to limit the insurance companies' exposure from high-risk individuals' insurance claims. The states also have lowered health insurance costs by allowing decreased benefits (however, this can decrease quality). However, states have limited means to actually decrease the costs of healthcare.

Quality

Many states have attempted to increase the quality of care via expanded coverage within the state-sponsored entitlement programs or through rules mandating specific coverage benefits that insurance products must offer. Some states have set up commissions to address the quality of healthcare.

Types of State Initiatives

The individual states have taken several specific initiatives to increase health insurance coverage. These initiatives include the following: expanding eligibility for Medicaid and other federal programs, offering reinsurance, creating high-risk pools, establishing mandated and limited-benefit plans,

imposing individual mandates, allowing group purchasing arrangements, adding dependent coverage, and providing administrative assistance.

Medicaid and Other Federal Programs

Medicaid is the nation's largest health insurance program for the poor, covering over 40 million Americans. Medicaid is a joint federal-state government program. It is financed by both the federal government and the individual states. The federal government matches state spending on qualified Medicaid recipients.

Both the federal government and the states set the rules for Medicaid eligibility. The Medicaid program was created by the federal government to provide health insurance to needy members of society—impoverished families with children, the disabled, and elderly individuals. As a federal program, Medicaid is not a purely state-based coverage initiative; but the states define eligibility (within limits) and administer their own Medicaid programs. The federal government establishes some minimum and maximum eligibility criteria, but the states have some flexibility in determining who qualifies for Medicaid. Additionally, multiple waivers are available to allow the states to expand coverage beyond their historical limits. As a result, state control of the Medicaid program is the most important means for a state to provide coverage for its uninsured residents.

The states may expand Medicaid eligibility beyond the federal criteria, but matching federal funds will not be provided unless the state has a waiver for the expanded coverage. Certain groups are eligible for Medicaid, including children living under a specific federal poverty level, parents of children living under a specific federal poverty level (which differs from state to state), pregnant women below the poverty level, elderly and disabled social security insurance beneficiaries with incomes less than the poverty level, some working disabled, and Medicare buy-in groups. Other groups, if designated by the state, are allowed to be covered with-outspecial waivers. These optional Medicaid-eligible groups include some subsets of the same groups (children, parents of children, disabled, and elderly) that exceed the specific federal poverty limits—for example, children over the age of 6 who live over 100% of the federal poverty level but are still

impoverished by state-set standards. Other groups, such as the medically needy, may be permissible. The federal government sets specific guidelines for these groups, but multiple avenues exist for states to try to expand coverage and still receive matching funds. The flexibility of coverage criteria results in a wide range of eligibility standards from state to state. This range of eligibility variability will likely continue to expand.

The federal Personal Responsibility and Work Opportunity Reconciliation Act of 1996, better known as the Welfare Reform Act, created options for the states to expand Medicaid. The provisions in Section 1931 of the act require states to continue to cover families with incomes below the 1996 Aid to Families With Dependent Children (AFDC) income limits regardless of whether they receive cash assistance. More important, Section 1931 gives states greater flexibility to extend eligibility to more low-income families. The states are allowed to disregard some of an individual's income or assets. By ignoring some income or assets, many additional individuals meet the federal criteria for poverty.

Federal SCHIP allows states to provide health insurance coverage to uninsured children in low-income families that are not otherwise eligible for Medicaid. The states are allowed to include children from families with higher income levels than otherwise allowable. Additional funds were designated for this program, and additional rules for copayments and benefits are allowed. The federal matching rate is higher for this program than for traditional Medicaid, but the total SCHIP funds available to all the states, in aggregate, are capped, and new funds will determine the future of this program.

The federal Ticket to Work and Work Incentives Improvement Act of 1999 provides another way to increase Medicaid eligibility. Under this law, states may permit working individuals with disabilities to maintain their Medicaid eligibility.

Another major initiative of the federal government to encourage the states to explore novel ways to expand coverage is Section 1115 of the Social Security Act. This law allows the federal government to waive certain Medicaid requirements in order to conduct pilot, experimental, or demonstration projects that expand or improve health insurance coverage.

In 2001, the Health Insurance Flexibility and Accountability Act expanded Section 1115. It encourages new comprehensive state approaches to increase the number of individuals with health insurance coverage with current-level Medicaid and SCHIP resources. However, these new initiatives cannot increase a state's federal matching funds.

Reinsurance

Reinsurance, insurance for insurance companies, provides an avenue for insurance carriers to lower their risk and therefore lower the premiums they charge. The state is likely to be the source of the reinsurance, but reinsurance can be a private enterprise that is encouraged by the state. The reinsurance is specifically created to cap the risk exposure from high-risk health insurance policies. The reinsurance premium is paid by the insurance carriers in exchange for limiting their risk. For example, maximum 1-year claims may be capped at a predetermined figure. Any claims higher than the capped amount would be covered by the state reinsurance fund. Limiting the insurance carriers' liability should entice the carriers to offer policies to higher-risk individuals, groups, or small businesses. Only a few states currently have reinsurance plans.

High-Risk Pools

High-risk pools create a source of health insurance to high-risk individuals who could otherwise not access it. The high-risk pools attempt to create an option for individuals who are the most difficult to insure—those who do not qualify for entitlement programs, have preexisting medical conditions, and do not have access to group insurance policies. The high-risk pools are state associations specifically created as a last option for health insurance. Most states have created high-risk pools. The federal Health Insurance Portability and Accountability Act of 1996 (HIPAA) requires that people leaving a group health insurance policy be able to access an individual policy. Each state sets its own premium rates (usually significantly higher than group insurance rates) and then uses specific insurance carriers to administer the health insurance. High-risk pools usually require additional funds to cover the claims expenses, as many of the

covered individuals have costly healthcare needs. Most states view high-risk pools as a last resort and establish strict guidelines on accessing them to encourage individuals to seek other options first.

Mandated and Limited-Benefit Plans

State legislatures require health insurance policies to offer specific benefits. Each state has its own list of mandated benefits. Most of these mandated benefits are essential and needed safeguards, while a few of the mandates emerged as reactions to isolated public events. These mandates generally increase the quality of healthcare, but they also increase overall healthcare expenses. In an attempt to make health insurance more affordable, and thereby increase coverage, many states have allowed (and/or encouraged) insurance carriers to offer bare-bones policies. These policies usually suspend the state mandates and frequently offer a reduced set of healthcare benefits, such as catastrophic coverage only.

Several states have limited-benefit plans, but their effectiveness in expanding coverage has been small. The limited-benefit plans tend to be only slightly less expensive than comprehensive plans; they do not sell well, and insurance companies do not like to market them. Additionally, when individuals who previously had a comprehensive plan purchase limited-benefit plans, many of them actually reduce their health coverage, creating an unintended effect.

Individual Mandates

Individual mandates require individuals to obtain health insurance coverage. Presumably a financial penalty (added to an individual's state tax obligation) would ensue for those failing to obtain health insurance. Individual mandates have been passed by a few state legislatures, but they have not been effective. Impoverished or low-income individuals, those most likely to be uninsured, do not generally pay state income taxes.

Group Purchasing Arrangements

Group purchasing arrangements are small groups or individuals who join together to purchase health insurance. The goal is to create a large

group that can qualify for lower health insurance premiums. Group purchasing arrangements can be formed outside state governments, but many states have organized these groups to facilitate individual purchase of health insurance. Little evidence exists, however, that these groups actually have access to less expensive health insurance.

Dependent Coverage

Dependent coverage allows minors to receive health insurance through their parent or guardian. Young people older than 18 years often go without health insurance. Several states have changed laws to allow these individuals to continue qualifying for dependent coverage past age 18 and school enrollment. These arrangements are quite effective as the dependent coverage can be reasonably priced and involves no expense for the states.

Administrative Assistance

Some states encourage their residents to access health insurance by providing various kinds of administrative assistance. For some states, this means offices to enroll residents in Medicaid, but for other states the assistance can be quite extensive. Some states attempt to find private insurance or offer additional state financial benefits for individuals who use local government medical services.

Federal Limits on State Power

The federal Employee Retirement Income Security Act (ERISA) of 1974 created employer mandates for health insurance coverage. This federal law sets guidelines for companies offering health insurance coverage. The states may not pass laws with additional health benefit rules for specific companies. As a result, no state can expand health insurance coverage by placing the burden on business enterprises. However, the states are allowed to raise revenues from businesses and individuals to pay for state health insurance coverage schemes. Several states have implemented "play or pay" laws that force businesses to pay additional taxes if they do not provide additional state-mandated coverage. These laws seem to be allowable by the courts if the businesses are given a real option between the tax and employer-sponsored insurance. If the tax

poses a choice that is not much better than providing employer-sponsored insurance, it is unlikely to be considered legal under ERISA.

Future Implications

Increased globalization and the competitive economy are pushing many companies to decrease employer-sponsored health insurance. Without a national health insurance program, the states are being forced to develop expanded coverage systems. The states have implemented and proposed a wide variety of health coverage initiatives. State-based coverage initiatives have explored a range of proposals, but no state has successfully eliminated the problem of the uninsured. Many proposals are being tested, and many remain to be explored. As some states are finding ways to expand coverage, other states may follow their lead.

Richard A. Guthmann

See also Access to Healthcare; Economic Barriers to Healthcare; Employee Retirement Income Security Act (ERISA); Health Insurance; Health Insurance Coverage; Medicaid; Public Policy; Uninsured Individuals

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 Henry J. Kaiser Family Foundation (KFF):
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 National Academy for State Health Policy (NASHP):
<http://www.nashp.org>
 State Coverage Initiatives (SCI):
<http://www.statecoverage.net>

STATE CHILDREN'S HEALTH INSURANCE PROGRAM (SCHIP)

The federal Balanced Budget Act of 1997 created the State Children's Health Insurance Program (SCHIP) as part of Title XXI of the Social Security Act. SCHIP is the single largest expansion in health insurance coverage since the enactment of Medicaid in 1965. The goal of SCHIP is to increase the medical coverage of low-income, uninsured children up to the age of 19 by extending eligibility for public insurance to children in families earning too much to qualify for Medicaid yet earning too little to afford private health insurance, which generally includes families earning between 100% and 200% of the federal poverty level. The SCHIP legislation apportioned more than \$40 billion in federal matching funds over 10 years beginning in FY1998. States are allowed to use these funds to expand Medicaid eligibility, develop new insurance programs, and increase outreach for children already eligible for public coverage.

Program Design

Like Medicaid, SCHIP is a joint federal-state program, though SCHIP offers states more flexibility with respect to eligibility criteria, program design, and benefits. States had three broad options for

implementing SCHIP. They could expand their Medicaid programs by either increasing income eligibility thresholds or extending coverage to age groups that were not eligible for Medicaid previously, create a new separate health insurance program for children, or do both. At the time of implementation, a key argument for expanding Medicaid was that states could build on existing infrastructure for administration, enrollment, and processing of claims. The main disadvantages of this approach were the requirement of conforming to existing federal rules that some states considered burdensome as well as the effect of any negative reputation associated with Medicaid. The main argument for creating a new insurance program for children was that it would allow greater flexibility in designing a program that better met the needs of children in a particular state. However, a separate program must contend with the potentially higher costs associated with start-up and outreach.

Unlike Medicaid, the law creating SCHIP included specific provisions that mandated states to include outreach efforts as a part of their expansion. As part of this effort, states created television, radio, and print advertising campaigns to increase awareness about the programs. Toll-free information lines and Web sites were also established. In California, for example, the outreach campaign included two main components, (1) the use of community-based "application assistants" to reduce the process and outcome costs of enrolling and (2) a media campaign to increase awareness of the program and reduce the information costs of enrolling, with roughly \$7 million devoted to each component in the 1st year. Nearly every state also instituted a number of administrative reforms, such as simplifying application forms and eliminating face-to-face interviews, which had previously been required of Medicaid applicants.

Another innovative aspect of SCHIP is the explicit attempt to limit the degree of substitution from private insurance in favor of public insurance, or crowd-out. The most common strategy taken by states to reduce crowd-out was the requirement that children be without health insurance coverage for some period of time (typically 3–6 months) prior to enrolling in the program. In addition, a few states used sliding-scale premium contributions for families with incomes above 150% of the federal poverty level and subsidies to

encourage parents to take up employer-based health insurance coverage when it was available.

Like Medicaid, SCHIP financing features a federal matching rate for state dollars contributed to the program. The federal medical assistance percentage (FMAP) is the rate at which the federal government shares the expenditures associated with each state's Medicaid program. The FMAP formula is calculated annually and is a function of the average per capita income of the state relative to the national average. States with lower average per capita incomes receive a higher FMAP, while states with higher per capita incomes receive a lower FMAP. To encourage state participation in SCHIP, states receive an enhanced FMAP for their SCHIP expenditures. While the Medicaid FMAP ranges from 50% to 76% in FY2006, the enhanced SCHIP FMAP ranged from 65% to 83% across states.

Title XXI of the Social Security Act specifically states that children with insurance, including children with Medicaid coverage, are not eligible to enroll in SCHIP. To prevent states from shifting enrollees from Medicaid to SCHIP to take advantage of the more generous federal matching rates, the legislation requires that children who apply for SCHIP be screened for Medicaid eligibility and those found to be eligible only be enrolled in Medicaid. Because of this rule, it is possible that SCHIP "marketing" may have indirectly increased the Medicaid enrollment of children who were already eligible for but not covered by that program.

The benefit package for SCHIP enrollees was mandated to contain at least the benefits required for Medicaid recipients, though additional benefits could be added by states if they chose.

Implementation

States implemented SCHIP at various times and in various ways. Thirty-four states enacted their programs in 1998. Eleven states did so in 1997, and the remaining six states began in 1999 or 2000. Nineteen states have expanded their Medicaid programs to include SCHIP, 15 states created a separate new program, and 17 states implemented a combination of expanded Medicaid and the new program. States that implemented both Medicaid expansions and a separate SCHIP expansion were

able to start these components at different times, usually expanding Medicaid eligibility first.

States differed in their initial preprogram eligibility criteria, and within states, rules tended to be more generous for younger children. Prior to SCHIP, states were required to cover children 6 years of age and under up to 133% of the federal poverty level and were allowed to expand coverage up to 185% and still receive federal matching dollars. As of 1996, several states had used their own funds to expand eligibility beyond 185% of the poverty level. Since eligibility increases were larger in states that previously had lower eligibility limits for Medicaid, the SCHIP expansions have reduced the cross-state variation in public insurance eligibility standards. Likewise, in many states, prior to SCHIP, income eligibility limits were substantially higher for younger children than for older children. By increasing income limits more for older than for younger children, the SCHIP expansions largely eliminated this within-state variation in eligibility.

Effects on Insurance Coverage

The early experience with SCHIP was fraught with some degree of anxiety that enrollment was not meeting expectations. Some of this concern might have been rooted in the ambitious nature of many state expansion plans. A large number of studies have examined the impact of SCHIP on children's health insurance coverage. Fewer studies have examined the effect of SCHIP on children's health.

The best available evidence points to a modest effect of SCHIP on the health insurance coverage of children. Studies have found that about 8% to 10% of children meeting eligibility standards for SCHIP enrolled in the new program.

Recent Developments

In 2007, SCHIP came up for reauthorization. Considerable disagreements were apparent between those who wanted to expand the income eligibility limits for the program and those who wanted to maintain the status quo with respect to the program. Several expansion bills were passed by the U.S. Congress but were vetoed by the President. Ultimately, the program was not expanded.

In December 2007, the U.S. Congress passed—and the President signed—the Medicare, Medicaid,

and SCHIP Extension Act to continue SCHIP coverage through March 2009. This legislation maintains the current federal SCHIP funding level at \$5 billion a year. The bill also includes additional funds for states with projected shortfalls.

The ongoing reauthorization debate over SCHIP has created uncertainty among states regarding their programs. Several states, anticipating a lack of federal funding, are operating on contingency plans. Others have established enrollment caps and implemented more cost-sharing measures, including increasing premiums.

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See also Access to Healthcare; Child Care; Crowd-Out; Health Insurance; Medicaid; Public Policy; State-Based Health Insurance Initiatives; Uninsured Individuals

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STEVENS, ROSEMARY A.

Rosemary A. Stevens is a well-known and highly respected social medical historian. She began her career as a National Health Service (NHS) hospital administrator in Great Britain, and much of her subsequent academic work describes comparatively the orientation of healthcare in the United Kingdom and the United States. In her various scholarly works, Stevens has described how American hospitals are unique: a combination of public and private institutions that are at once charities and businesses, social welfare institutions and icons of American science, wealth, and technical achievements. This rare combination of public and private is different from hospitals in other advanced nations, especially her native United Kingdom. American hospitals have little concern with improving public health. Also, many professional healthcare organizations function largely as interest groups, jostling with others for political favors. Stevens' work is an alternative vision—one in which professionals, healthcare institutions, and government serve the public interest. She describes the American healthcare system without bitterness or anger. According to Stevens, this is how it is; it is not all bad, but it could be better.

Born in Lincolnshire, England, in 1935, Stevens attended Oxford University as an undergraduate, majoring in English literature. Later, she pursued graduate studies at Yale University, earning a master of public health degree in hospital administration and medical care in 1963 and a doctoral degree in epidemiology in 1968. After graduation, she taught at Yale University for 8 years, followed by a 2-year appointment at Tulane University. In 1979, she joined the University of Pennsylvania, where she has spent most of her career. Stevens served as chair of the department of history and sociology of science from 1980 to 1983 and again from 1986 to 1991, when she was appointed the first woman dean of the University of Pennsylvania's School of Arts and Sciences. In 2002, she moved to Cornell University. Currently, she is the DeWitt Wallace Distinguished Scholar at the Weill Cornell Medical College in New York City.

Stevens's scholarly works include *Medical Practice in Modern England: The Impact of Specialization and State Medicine* (1966) and

American Medicine and the Public Interest (1971). In 1974, in conjunction with Robert B. Stevens, she published *Welfare Medicine in America: A Case Study of Medicaid*. This was followed by *In Sickness and in Wealth: American Hospitals in the Twentieth Century*—arguably her best-known work. Stevens organized and coedited *History and Health Policy in the United States: Putting the Past Back In*. Her most recent book, *The Public-Private Health Care State: Essays on the History of American Health Policy*, includes 17 of her essays, spanning a 40-year period, from 1961 to 2001.

Stevens has received many awards and honors. For example, she received the Robert Wood Johnson Foundation Investigator Award in Health Policy Research for the years 1998–2003. In 2003, she received the Lifetime Achievement Award from the American Association for the History of Medicine. She also has been given four honorary doctoral degrees.

Stevens has served on numerous boards and committees, including the American Board of Medical Specialties, the Educational Commission for Foreign Medical Graduates, and the Milbank Memorial Fund. She has been a member of the National Academy of Sciences, Institute of Medicine (IOM), since 1973.

Blair D. Gifford

See also Comparing Health Systems; Hospitals; International Health Systems; Physicians; Public Policy; United Kingdom's National Health Service (NHS)

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STRUCTURE-PROCESS-OUTCOME QUALITY MEASURES

Avedis Donabedian (1919–2000), a physician and professor of public health at the University of Michigan, first proposed the conceptual model of assessing the quality of healthcare using structure-process-outcome measures in the 1960s. Donabedian's model continues to be widely used for evaluating quality within healthcare. Structure measures in the model include the characteristics and traits of the healthcare providers, their tools and resources, and their physical and organizational work settings. Process measures include the set of activities that occur with and between the providers and patients. Outcome measures include the change in a patient's current and future health status due to the care he or she received. Each of these measures is discussed in more detail below, along with the methods used to obtain information, research studies using this model, and future implications.

Structure Measures

Structure measures refers to the conditions under which care is provided, with the notion that if the structure is appropriate, good-quality medical care will follow. Material resources such as adequacy of facilities and equipment are taken into consideration, as are professional and organizational resources that support and direct provision of care (e.g., staff credentials, facility-operating capacities, performance review, and fiscal organization). Donabedian's concept of structure is especially relevant for organizational learning, in terms of encompassing the more stable characteristics of the care delivery system: staffing, equipment, facilities, and the way these are organized to deliver care. It also includes formalized organizational routines, such as the process of passing patient information across shifts.

Using structure to measure the quality of care leads to relatively concrete and accessible information. Structure data are essential to system-level organizational learning and improvement. The primary limitation in using structure is that the relationship between structure and process or structure and outcomes is rarely well established.

Process Measures

Process measures of quality refer to things done to or for the patient by practitioners in the course of treatment, including clinical history taking, the appropriateness and thoroughness of physical examinations, the number and type of diagnostic tests given, and technical competence in diagnostic and therapeutic procedures such as surgery. Other process measures include preventive management, coordination and continuity of care, referral criteria, and patient education. Estimates of quality obtained through process measures are not as stable or final as those obtained from outcome measures. Many times, process measures are used to identify whether medicine was practiced properly or not. Process-of-care evaluation has several advantages. It is directly related to the practice of medicine and is relatively easy to conduct. Many diseases have established, peer-reviewed models on which to base evaluations. In addition, data can be analyzed for population studies or health delivery systems where computerized data networks are available. Such measurements provide direct indicators to the areas needing quality improvement.

Two methods are used to measure process quality: explicit and implicit review. Explicit review is based on analyzing medical care from medical records. Under ideal circumstances, the analysis should be based on a set of concrete values formulated by experts or recognized professional organizations such as the American Heart Association. The measurement criteria are developed after careful evaluation of clinical trials, cohort studies, and established practice protocols to produce evidence-based quality indicators. Explicit reviews suffer some drawbacks in that the complexity and variety of medical care makes congruency in formulating such indicators difficult, and each organization can have different criteria. Also, they can be incomplete and fail to reflect the totality of care offered to a patient, as not only physicians are involved in care. To make explicit reviews more meaningful, there is a need to identify the processes that truly improve outcomes and correlate them with clinical judgments individually and not collectively, as each person can have unique factors that can influence outcomes.

In contrast, implicit review involves a personalized, critical appraisal of the quality of care

received and has no set protocols as yet. It is particularly relevant to physicians, as it takes into consideration the exigencies and limitations of the situation while administering care. Medical errors are commonly subjected to implicit reviews, which can be expensive and time-consuming. There can be significant differences in assessments between reviewers due to divergence of views in the absence of set protocols. Attempts to improve the quality of implicit reviews include the creation of standard review forms and coding criteria, aggregating scores, and making statistical adjustments for bias. Other changes include the process of simplifying the clinical factors under review to eliminate reviewer bias and the tendency to give credence to outcomes over process.

Quality improvement research suggests that process measures are more sensitive than outcome measures to differences in quality across providers and/or time. Process measures are easier to interpret, partly because accountability is clearer.

Outcome Measures

Outcome measures are the desired states resulting from care processes. Outcome measures such as recovery, restoration of function, and survival have been frequently used as indicators of the quality of medical care. Technical outcomes encompass the physical and functional aspects of care, such as the absence of postsurgical complications and the successful management of chronic conditions, while interpersonal outcomes encompass dimensions of the “art” of medicine, such as patient satisfaction with care and the influence of care on the patient’s quality of life as perceived by the patient.

Outcome measures can also be divided into five broad categories: death (mortality), disease (morbidity), disability (days of disability, work loss), discomfort (pain), and dissatisfaction (patient dissatisfaction, compliance with treatment regimens, provider retention). Excessive focus on the worst outcomes, such as death and severe disability, could lead to insufficient attention to prevention of minor disabilities, discomfort, and dissatisfaction.

Theoretically, lower mortality and morbidity rates, fewer readmissions or hospitalizations, and higher quality-of-life measures are equated with better quality of care. However, blind acceptance

of these statistics is not justified, as these numbers may not adequately reflect the case-mix differences in various categories of hospitals. For example, a large inner-city public hospital may treat patients with more complications, due to delays in seeking care because patients lack health insurance coverage, as compared with a suburban private hospital. To compare outcomes without accounting for these differences may lead to biased and false conclusions. Such measures act as disincentives to offering treatment to disadvantaged and more severe patients, to preserve rankings, and they also perpetuate disparities in care. There are few case-mix computerized data models available on which a fair evaluation of surgical and medical outcomes can be made. To improve quality-of-care outcomes research, it is imperative to create and use such assessment tools. In the absence of such tools, limited case-mix models are being used to judge whether quality of care was optimal at all levels: emergency department, inpatient, outpatient, and follow up.

Outcome measures can be viewed from several different perspectives, depending on the objectives of a study. Long-term, intermediate, and short-term outcomes need to be judged on different criteria. Consider, for example, patients suffering from heart attacks; for these patients, prevention of death soon after the attack is a short-term outcome involving different levels of care, while the long-term morbidity, quality-of-life, and mortality outcomes are viewed differently. Health outcomes are governed considerably by many factors outside the clinical domain, including social, psychological, environmental, socioeconomic, and personal factors, which need to be accounted for when studying health outcomes. Patients’ preferences for treatment and adherence to it, their will to recover, and their assessment of quality of service are difficult to quantify, though these may significantly influence health outcomes.

Outcome measures tend to have more face validity than process measures and are more meaningful in the discussion of patient safety. Outcomes tend to be concrete, and the use of outcome measures lends itself to precise measurement where validity is rarely questioned.

The advantages of outcome measurement include the ease of measuring concrete factors such as death or functional recovery from strokes or

injuries. They can be used as screening tools to indicate the areas that need process measurement to improve the quality of outcomes. The disadvantages of outcome measurement are that they tend to be focused on aggregate data rather than on individual cases. They are therefore not equipped to change individual behaviors. Second, they are retrospective, so that on-the-spot treatment decisions cannot be analyzed and changed for the better. Third, outcome measures have scant correlation to process measures in many areas, thus limiting reliance on outcome measures exclusively. Last, most patients receive care from several different physicians and facilities over their lifetimes, thus blurring the clear delineation of entry to and exit from care and the fixing of responsibility. The high costs of conducting such evaluations also act as barriers.

Several limitations exist in using outcome as a quality-of-care measure. Sometimes a particular outcome measure is irrelevant, or the outcome measure is not the most relevant measure. Factors outside medical care, such as genetic factors and personal history, can influence the outcome. Some outcomes are not clearly defined or can be difficult to measure: patient attitudes and satisfactions, social restoration, physical disability, and rehabilitation. The limitations of outcome measures do not mean that they are inappropriate indicators of quality; they just simply must be used carefully.

Sources and Methods of Obtaining Information

Patient medical records are often used for assessing the quality of healthcare. However, questions arise about how thorough or appropriate these records are as a source of information. For example, are the records complete, is the record or the care provided being rated, and should the entire record or only the abstracted information be used for evaluation purposes?

Patient medical records are often not adequate to serve as a basis for evaluation in general practice. Observation of a physician by a qualified colleague is the best alternative, though some dimensions of care are not observable and would not be included in the evaluation. The major limitation of direct observation is the change of usual practice by those who know that they are being observed.

Studying behaviors and opinions is an indirect method of obtaining information about quality. For instance, in seeking care for themselves and their families, physicians exhibit critical and valid judgments concerning the capacity of their colleagues to provide a high quality of care. An *auto-reputational* approach is one in which hospital personnel (managerial, profession, and technical) and knowledgeable community members rank and rate the hospital's quality of medical care.

Patient evaluation constitutes the consumer's perspective of the quality of care. Healthcare organizations and practices exist to serve patients, and their objective is to satisfy consumer needs and aspirations to the best of their ability. Collecting patient feedback provides valuable insights into perceived shortfalls in treatment and care and is gaining increasing acceptance as a way to evaluate quality of care. Patient evaluations are also able to provide feedback on organizational shortcomings in structure and process measures, such as long waiting times, unsatisfactory clinical care, or wrong billing. Constant review of patient evaluations is helpful in initiating changes to improve the overall quality of care.

Research Studies Using the Model

Most research studies using the structure-process-outcome model examining ambulatory care have focused on structure and the process of care rather than the outcomes of care. Physician characteristics that were found to be associated with greater conformity to standards of care are length of training, primary-care specialization, practicing area of specialty training, and continuing education.

In terms of inpatient hospital care, evidence supports a volume-quality relationship; that is, mortality rates are lower in high-volume facilities. A variety of structural measures have not been conclusively associated with outcomes, including: public versus private institutions, teaching hospitals and patient satisfaction, physician capabilities (board certification, years of experience), and nurse to patient staffing ratios. Higher registered nurse staffing and years of nursing experience have been found to be associated with better postsurgical outcomes but not with mortality rates.

Studies of the association between nursing home structure and resident-care outcomes focus

on capacity and capability measures. Outcome-centered studies demonstrate the lack of a consistent relationship between bed size and measures of mortality, discharge status, patient functioning, patient satisfaction, and quality of life. Registered nurse to resident ratios have been found to be associated with better physical functioning, lower mortality rates, higher likelihood of discharge back to the resident's home, and less unnecessary hospitalization.

A serious lack of information exists concerning whether structural characteristics make a difference in outcomes of home health care services.

The structure-process-outcome model is frequently used for assessing internal quality-of-care measures, which do not need to be very stringent. There is a lack of computerized systems that provide data on the continuum of care, so essential in managing chronic diseases, which now form the bulk of medical care. The use of integrated health systems that have community outreach is necessary to really assess quality outcomes in healthcare. This is now the focus of many health services researchers who are implementing such models.

Future Implications

Health services research using structure-process-outcome quality measures focuses on organizational capacity and capability. Concepts of structure and outcome are evolving as perspectives on what constitutes meaningful measures have changed.

The accrediting organizations, the government, and the general public are increasingly demanding quality and patient safety data from healthcare organizations. Clinical practice guidelines designed to capture the essence of state-of-the-art and evidence-based care have become more prevalent. And efforts to measure patient satisfaction have grown.

However, many challenges remain in identifying excellent quality of healthcare. Clinical knowledge is constantly changing; therefore, the definition of quality healthcare must evolve. Furthermore, individual patients tend to value different aspects of care. Researchers suggest

broadening the current quality measurement lens, specifically incorporating patient preferences, and adding a focus on the organization. Encouraging the development and use of integrated, computerized systems that can provide data on parameters of quality of care in its continuum will likely help improve the quality of healthcare at all levels.

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See also Case-Mix Adjustment; Donabedian, Avedis; Evidence-Based Medicine (EBM); Joint Commission; Quality Indicators; Quality of Healthcare; Outcomes Movement; Volume-Outcome Relationship

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SUBSTANCE ABUSE AND MENTAL HEALTH SERVICES ADMINISTRATION (SAMHSA)

The Substance Abuse and Mental Health Services Administration (SAMHSA) is a unit of the U.S. Department of Health and Human Services (HHS). Established in October 1992 as a result of Public Law 102-321, SAMHSA has as its statutory mission the provision of prevention and treatment services for people at risk of or suffering from mental or substance abuse disorders. SAMHSA works in partnership with states, communities, and private organizations to address the needs of people with substance abuse and mental illnesses as well as the community risk factors that contribute to these illnesses. SAMHSA's most recent strategic plan describes its vision as providing a life in the community for everyone and its operating mission as the building of resilience and facilitating recovery. A matrix of priorities based on cross-cutting principles and programs and issues delineates the overall scope of its services and program expectations.

Background

Prior to the creation of SAMHSA in 1992, the Alcohol, Drug Abuse, and Mental Health Administration (ADAMHA) was charged with both drug and alcohol research and the provision of treatment services. A study in early 1992 led to the decision to separate the research function from the treatment function to more efficiently and effectively use resources. As a result of this study, SAMHSA was created to provide treatment and mental health services, and research funding was moved to the National Institutes of Health (NIH), where two institutes—the National Institute for Drug Abuse (NIDA) and the National Institute on Alcohol Abuse and Alcoholism (NIAAA)—serve as the repositories for research into alcohol and drug abuse. A third NIH institute, the National Institute of Mental Health (NIMH), conducts and supports research on mental health and mental illnesses.

In the decade leading to the restructuring and creation of SAMHSA, efforts to use a public health

model with community treatment options for mental health issues were slowly being included in state health plans for services. Efforts also evolved to move services, particularly in mental health, from institutional models to community-based care. In addition, a core value in the creation of SAMHSA was to link services more closely to the results of research models validating an evidence-based framework for service delivery.

Structure and Function

SAMHSA is organized into three centers and an office. The units are the Center for Mental Health Services (CMHS), the Center for Substance Abuse Treatment (CSAT), the Center for Substance Abuse Prevention (CSAP), and the Office of Applied Studies (OAS).

Specifically, the CMHS is charged with improving the quality of and access to mental health services, particularly for those who are underserved. The CSAT promotes the quality and availability of community-based substance abuse treatment services for individuals and families. The CSAP works with states and communities to develop comprehensive prevention systems that create healthy communities in which people enjoy a high quality of life. The OAS serves as a focal point for data collection and analysis and for dissemination of critical public health data to assist policymakers, providers, and the public in making informed decisions regarding the prevention and treatment of mental and substance abuse disorders.

The CMHS leads government efforts to treat mental illnesses by promoting mental health and by preventing the development or the worsening of mental illnesses if at all possible. The center currently has initiatives in the areas of adults with severe mental illnesses, including those who are homeless; services to children and adolescents; emergency mental health and traumatic stress services; and work with jail and prison populations. It also works collaboratively with the other two SAMHSA centers to study the impact of managed care on services to individuals with substance-abuse-related needs. Public health education, advocacy, and data collection and analysis round out the scope of initiatives that are the primary responsibility of the center.

The CSAT works with states and community-based groups to improve and expand existing substance abuse treatment services under the Substance Abuse Prevention and Treatment Block Grant Program. The center supports a free treatment referral service to link people with the community-based substance abuse services they need. Programs and initiatives supported by the center embrace the philosophy that treatment and recovery work best in a community-based, coordinated system of comprehensive services. This philosophy is based on research and a consensus of experts in the addiction-care field. The center also supports the nation's effort to provide multiple treatment modalities, evaluate treatment effectiveness, and use evaluation results to enhance treatment and recovery approaches so as to reach the greatest number of individuals in need of services.

The CSAP provides leadership in the federal effort to prevent alcohol, tobacco, and other drug problems. The center has developed a model for prevention called the Strategic Prevention Framework (SPF), which aims to promote youth development, reduce risk-taking behaviors, build assets and resilience, and prevent problem behaviors across the individual's life span. The SPF is a five-step process—assessment, capacity, planning, implementation, and evaluation—and is designed to create sustainable and culturally relevant prevention services. Programs supported by the center's funds must use the SPF and be based on or adapted from recognized model programs.

Last, the OAS is responsible for providing data to the public related to the incidence of alcohol and drug use, drug-related emergency department treatment and deaths, and the treatment network of services. The data provided help support planning and budget efforts and validate the outcomes of efforts by SAMHSA-funded programs.

Linda F. Samson

See also Disease; Epidemiology; Mental Health; Mental Health Epidemiology; Pharmacy; Prescription and Generic Drug Use; Public Health; Vulnerable Populations

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Web Sites

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Substance Abuse and Mental Health Services Administration (SAMHSA): <http://www.samhsa.gov>

SUPPLIER-INDUCED DEMAND

Traditional economic theory assumes that the market for health services is characterized by an upward-sloping supply curve and a downward-sloping demand curve. Patients are assumed to be rational consumers who make informed utility-maximizing choices, while physicians are profit maximizers. The theory predicts that an excess supply of physicians in relation to the population will result in an outward shift of the physician supply curve, lower fees charged for services, and lower revenues. To avoid the loss of revenues, most economists believe that physicians exploit the information asymmetry (a result of patients' lack of clinical knowledge) in the market for their services and shift the demand curve up, resulting in higher revenues. This phenomenon is termed supplier-induced demand. It occurs when a physician has a financial incentive to recommend treatments whose medical benefits are outweighed by

the costs. Supplier-induced demand is equated with unethical behavior because of the social welfare loss associated with inefficient treatment. Due to the prominent role physicians play in the healthcare industry, cost control measures will be difficult to implement under supplier-induced demand. By studying this phenomenon, policymakers will be able to design and develop relevant tools to minimize waste and improve access to healthcare.

Traditional economic theory predicts that when physicians have mixed patient caseloads (Medicare, Medicaid, and privately insured patients), a decrease in the fees charged to Medicare and Medicaid patients will result in substitution and income effects. Under the substitution effect, physicians will reduce their Medicare patient caseload and treat more privately insured patients. The income effect will result in the delivery of more services to both the Medicare and the privately insured patients to make up the income lost from the reduction in fees paid by Medicare patients. The observed increase in services to privately insured patients is consistent with both physicians' profit-maximizing behavior and demand inducement.

Why is demand inducement an interesting problem for economists to study? In addition to the waste involved, the existence of demand inducement contradicts the predictions of neoclassical economic theories of demand and supply, where the excess supply of physicians should lead to fee reductions. Proponents believe that if the market does not work as expected for physician services, the practitioners must be inducing demand. While this observation may be true, it does not consider the uncertainties involved in medical decision making.

The Demand Inducement Literature

Under the competitive model, physicians are expected to be perfect agents for their patients and should not induce demand for personal financial gains. An increase in physician density relative to population must result in decreased fees and utilization. Researchers have investigated the impacts of physician density, fee changes, physician monopoly power, and target income on the existence of supplier-induced demand.

Impact of Physician Density on Demand Inducement

The evidence of demand inducement using physician density has been ambiguous. Most of the researchers did not control for quality in their studies. If physician density increases, physicians could respond to market competition by differentiating the services delivered based on quality. Under normal circumstances, quality of care is an increasing function of time spent per patient during visits. Patients who value quality must be willing to pay more for higher-quality care. Using time per patient visit as a proxy for quality care, some researchers found that physicians react to increased competition by increasing the time spent per patient visit. Patients were also willing to pay more for longer time spent during visits. This result is attributable to improvements in the quality of care under competition rather than demand inducement. One study found that as the number of competing physicians increases in a given location, fees decline if quality is not controlled for. However, physicians reduce the time spent seeing Medicaid patients (substitution effect) when there is increased competition, while spending more time with the privately insured patients. In general, to survive in physician-dense areas, providers must deliver higher-quality care at higher fees and earnings per patient. This evidence is consistent with nonprice (quality) competition and does not necessarily reflect demand inducement.

Impact of Fees on the Supply of Services

An alternative method of testing for demand inducement relies on the relationship between the fees paid to physicians and the supply of services. Traditional economic theory predicts that when payments to physicians are reduced, they should not induce or create unnecessary demand in order to maintain their previous income levels. Supply of services must be reduced as predicted by the competitive-market model (upward-sloping supply curve). Here too, the evidence on demand inducement according to physician payments has been mixed. One study found that when California froze Medicaid payments in the early 1970s, physicians reacted by increasing the quality of services delivered. The same evidence of demand inducement was found among physicians in urban areas

of Colorado in response to Medicare fee reductions. Health services researchers also found that Canadian physicians responded to slow raises in physician payments by increasing the quantity and intensity of the services they delivered. However, other researchers using Canadian data found no significant relationship between fees and the utilization of certain medical procedures. The major critique of using fee reductions to test demand inducement is that fee reductions simultaneously result in lower patient copayments. A utility-maximizing consumer must react to reduced out-of-pocket payments by increasing service utilization.

The physician is assumed to be a utility maximizer where utility is a function of income. However, if leisure is an additional argument in the physician's utility function, the joint optimization of income and leisure will result in a backward-bending supply curve. This implies that depending on the level of fees, payment reductions could lead to increased delivery of services. Therefore, the evidence from using physician payments to test demand inducement is consistent with both supplier-induced demand and predictions of traditional economic theory. It is likely that physicians, acting as agents, make their decisions based on their assessment of patients' utility from treatment. The uncertainty involved in physicians' assessment of patients' utility from treatment may explain some of the lack of consensus in clinical decision making.

After controlling for fees, income, gender, and other socioeconomic factors, some researchers found a wide variation in the use of well-known medical procedures between small geographic locations. For example, in some studies, the actual variation exceeded the predicted utilization of total hip replacement by a factor of 110%; and in the case of colonoscopy, the actual variation exceeded the predicted utilization by 2,000%. The argument is that practice patterns may not strictly reflect an established set of well-defined clinical guidelines. These patterns may instead depend on the multiplicity of factors that influence clinical decision making, such as training, peer behavior, location, conference attendance, direct-to-consumer advertising, use of the Internet by patients, personal temperament and experience, financial incentives, time, age, and infrastructural capacity. Without a clear appreciation of the

uncertainties involved in medical decision making, it will be inappropriate to base cost-control or reimbursement policies on the estimated magnitude of demand inducement.

Target Income and Monopoly

The target income hypothesis postulates that physicians use their monopoly power to induce demand in order to satisfy a predetermined target income. Physicians are capable of exercising monopoly power because reputation, location, treatment style, patient preferences, and payment types combine to produce strong bonds among patients and their physicians. These bonds make it difficult for patients to easily substitute one physician for another and provide physicians with some degree of monopoly power. The target income hypothesis implies that an individual physician's behavior may be influenced by relative income. When physician density relative to population increases, physicians may exercise monopoly power by increasing their fees to achieve a target income. Since insured consumers pay only a small fraction of the cost of their treatment, physicians can raise prices without losing their patients. This behavior is aided by the fact that medical care is a credence good, where the utility impact is difficult to ascertain even after consumption. Reputation and price are possible indicators of quality for credence goods. Physicians with established reputations can exercise monopoly power and raise fees and utilization. Critics of the target income hypothesis argue that it has no foundation in economic theory. In addition, it is not known how these targets are set. Results of studies of the effects of target income on physician pricing decisions are mixed.

Future Implications

Studies aimed at identifying supplier-induced demand have resulted in contradictory or mixed results. Critics of these studies have based their arguments on the misspecification of the economic models used in many of them. The outcomes from these studies can oftentimes be justified by supplier-induced demand behavior, rational utility, and profit maximization models and by uncertainties in medical decision making. The

only study that controlled for quality found that when physician density in relationship to population increases, physicians react by differentiating their products based on quality improvements.

Few studies have addressed the uncertainties involved in medical decision making. Is there a set of gold standard guidelines that physicians have to strictly adhere to under all circumstances? If a physician's treatments deviate from the guidelines, is he or she necessarily a biased and unethical agent? Under supplier-induced demand, physicians recommend treatments whose benefits are outweighed by the costs. Medical decision making is characterized by uncertainty, and practice patterns reflect economic and noneconomic factors, including motivation, judgments, altruism, and professionalism. Therefore, there will be significant variability in observed treatment patterns and outcomes based partly on noneconomic factors. Health services researchers have documented wide variances in outcomes within specific locations after controlling for socioeconomic factors.

It has been proposed that an alternative test of the availability of supplier-induced demand is to observe the health services utilization of well-informed patients, namely, physicians. However, the findings by some researchers that physicians and their families do not use fewer medical services than their patients suggest that physicians also self-induce demand. If inducement is for private gains, then this result contradicts the accepted definition of supplier-induced demand. The ambiguity in supplier-induced demand research suggests that physicians, so as to do the best for their patients and themselves based on their medical knowledge, may overtreat or consume excessive amounts of medical services. While some physicians may exploit the gap in information for private gains, there is little evidence that this behavior is pervasive.

Membership in social networks embedded in healthcare-purchasing groups, as well as health literacy education, may diminish the information asymmetry between physicians and patients and lead to more optimal utilization of health services. Future research on supplier-induced demand must include the factors that motivate physicians to

deliver excessive healthcare services to their patients. Governments should not base cost-control policies on the concept of supplier-induced demand without understanding the uncertainties involved in medical decision making. In addition, governments must control direct-to-consumer advertising of drugs to prevent consumer-induced demand from being a confounding factor in supplier-induced demand research.

Edward Mensah and Dennis Cesarotti

See also Cost of Healthcare; Healthcare Markets; Health Economics; Health Insurance; Market Failure; Moral Hazard; Physicians; Public Policy

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- American Society of Health Economists (ASHE):
<http://healtheconomics.us>
- International Health Economics Association (iHEA):
<http://www.healtheconomics.org>

T

TARLOV, ALVIN R.

Alvin R. Tarlov is a physician, educator, and researcher whose vision and leadership have influenced physician workforce structure and training, thinking about what constitutes effectiveness in healthcare, and theory and research on the relationships between and among health and its multiple determinants.

Tarlov earned a bachelor's degree at Dartmouth College (1951) and a medical degree from the University of Chicago (1956). He completed a residency in Internal Medicine at the University of Chicago and spent 5 years conducting hematologic research.

Tarlov joined the faculty of the University of Chicago in 1964. As chairman of the Department of Medicine (1968–1981), he established the first academic division of general internal medicine in the country to address the growing problem of fragmented medical care caused by overspecialization of the physician workforce. In 1978, the Secretary of the U.S. Department of Health Education and Welfare appointed Tarlov chairman of the Graduate Medical Education National Advisory Committee (GMENAC) to advise the secretary on the most desirable number, specialty distribution, and geographic placement of physicians in each specialty. GMENAC's report stirred controversy because it refuted the commonly held belief that the geographic maldistribution of physicians and the poor health of large segments of the population could be effectively addressed by increasing the physician supply.

Struck by the lack of evidence comparing the effectiveness of medical specialists, surgical specialists, and generalists in treating specific conditions, Tarlov cofounded the Medical Outcomes Study to develop and apply measures of patients' functional capacity, well-being, and quality of life as the principal indicators of the effectiveness of medical services. This work became a bellwether in health services research as it led to a paradigm shift in thinking about the aims of medical care, the establishment of outcomes as the centerpiece of health services research, and spawned new fields of inquiry, including methodological research on functional status and quality-of-life measurement.

As President of the Henry J. Kaiser Family Foundation in Menlo Park, California (1984–1990), Tarlov developed a national program on community-based health education and disease prevention. Questioning the assumption that the substandard health of disadvantaged Americans could be explained by inadequate access to medical care, Tarlov began an interdisciplinary collaboration with sociologists, economists, psychologists, neuroscientists, and other scholars to explore the question of how social factors influence health. He convened an international conference on the social determinants of health, which led to the first book published on this topic.

Moving to Boston, Tarlov was appointed professor of medicine at Tufts University and professor of health promotion at the Harvard School of Public Health (1990–1999). He was director of The Health Institute at the New England Medical Center, devoted to research on the outcomes of medical care and on the

relationship of societal characteristics to population health. At Harvard University, he was chairman of the Mind/Brain/Behavior Society and Health Interfaculty Initiative. During this time, he developed and published a theoretical framework to describe the relationship between social inequality and social, psychological, and biological responses.

Tarlov served as director of the multiuniversity Texas Program for Society and Health in Houston (1999–2005) where he also was a professor in the University of Texas School of Public Health, professor of medicine at the Baylor College of Medicine, and Sid Richardson and Taylor and Robert H. Ray Senior Fellow in Health Policy at the James A. Baker III Institute for Public Policy, Rice University. While there, he received three statewide awards from community organizations in Texas for contributions to public policies to enhance early-childhood development and education.

Tarlov is a former Markle Foundation Scholar and National Institutes of Health (NIH) Research Career Development Awardee. He served as president of the Association of Professors of Medicine. He was elected to the national Institute of Medicine (IOM) and selected a master of the American College of Physicians. In 1992, Tarlov received from the Society for General Internal Medicine the Robert Glaser Award for Distinguished Contributions to the Advancement of General Internal Medicine. He was named Distinguished Internist of 1997 by the American Society of Internal Medicine. In May 2000, he was made an honorary fellow of University College London.

Tarlov, who is currently a professor of medicine at the University of Chicago, is completing as editor a book examining the evidence that public investment in early childhood development has greater promise and cost-effectiveness for improving population health, reducing health disparities, enhancing human capital formation, and promoting economic development than other public policy interventions designed for those purposes.

Elizabeth Tarlov

See also Health Disparities; Health Workforce; Kaiser Family Foundation; Outcomes Movement; Primary-Care Physicians; Public Policy; Short-Form Health Surveys (SF-36, -12, -8)

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TAX SUBSIDY OF EMPLOYER-SPONSORED HEALTH INSURANCE

One explanation for the structure of health insurance in the United States is the federal tax code. The nation's tax code excludes from taxation compensation received by employees in the form of employer-sponsored health insurance. This implicit subsidy encourages people to purchase insurance through their employers and to buy more health insurance coverage than they otherwise would. Thus, the tax treatment encourages both broader and deeper coverage by individuals. A case can also be made that the tax treatment, by encouraging generous health insurance coverage, increases healthcare utilization and prices. This leads to higher health insurance premiums and to many people forgoing private health insurance coverage.

History

Private health insurance in the United States essentially began with the Great Depression and grew

through the 1930s and into the early years of World War II. However, the federal tax code was silent on whether employer-provided health insurance was to be considered income that was subject to income tax. Employers increasingly used health insurance as a means of attracting and paying scarce workers during the war years. In 1943, the Internal Revenue Service (IRS) issued a private ruling holding that employer-sponsored health insurance benefits were not subject to federal income or payroll taxation. Over the years, a series of contradictory private rulings emerged, and in 1954, the U.S. Congress passed legislation making employer-sponsored coverage exempt from federal income taxes. With the enactment of Medicare in 1965, the exemption was expanded. The states have also followed the federal lead in the definition of income subject to state income taxes and similarly exclude employer-sponsored health insurance.

Impact of the Exclusion

The tax exclusion of employer-sponsored health insurance is not a trivial matter. It was estimated that in 2006, the combined federal and state income tax and federal payroll tax exclusions reduced tax collections by \$208.6 billion. Nearly 54% were the result of exclusion from the federal income tax, and more than 35% were from the exclusion of Social Security and Medicare payroll taxes. To put these values in context, in 2006, total Medicare spending was \$402 billion. The tax subsidy for employer-sponsored health insurance is slightly over one half as much as was spent on Medicare.

The tax exclusion provides strong incentives for workers and their employers to shift the form of employee compensation. From the employer's perspective, the tax exclusion is largely irrelevant. Whether the employer compensates its employees with money wages or with health insurance, both are legitimate business expenses, and both are deducted from revenue before computing the employer's tax liability.

From the worker's perspective, the form of compensation matters. Consider a single individual, who after claiming one exemption and taking the standard deduction has a taxable income of \$45,000. Under the federal tax laws and assuming

a 5% state income tax, the individual faces a marginal tax rate of 32.64%. That is, on the last \$100 earned, the individual owes combined taxes of \$32.64. Suppose that instead of taking all the compensation as money income, the individual took some as employer-sponsored health insurance. For every \$100 of coverage the individual took through his or her employer, the individual would reduce the tax liability by \$32.64. Stated another way, the \$100 of insurance coverage effectively cost the individual only \$67.36. If the individual had taken the average insurance bundle offered to insured workers in 2006, he or she would have effectively "purchased" \$4,248 worth of coverage for only \$2,860.60. The individual can be viewed as purchasing the coverage because he or she gave up money wages that would otherwise have been received as compensation for labor.

It is worth noting that this example is in no way extreme. It is estimated that the average tax subsidy for employer-sponsored health insurance is approximately 35% of the premium.

The tax subsidy for employer-sponsored health insurance provides incentives for people to buy insurance coverage that they otherwise might have ignored. They would do this by seeking out jobs that offered health insurance and lower wages rather than just higher wages. In addition, the tax subsidy provides incentives for people to take jobs that offer more generous health insurance packages than would otherwise be the case. They might do this by seeking out employers who offer better benefits or by encouraging their employers to expand the health benefits offered.

Empirical Evidence

A number of studies have attempted to estimate the effects of differences in tax rates on the prevalence and generosity of employer-sponsored health insurance. The difficulty is in marshalling data that contain information on the relevant household tax rate and the nature of the coverage available.

One study, by Jonathan Gruber and Michael Lettau, provides the most exhaustive analysis to date. It used wage and nonwage compensation data from the 1983 to 1995 Bureau of Labor Statistic's Employment Cost Index (ECI), augmented with data on individual workers from the Bureau of the Census's Current Population Survey

(CPS) and data on family taxes from the Department of the Treasury's Statistics of Income (SOI). The ECI provided information on some 203,000 jobs in more than 48,000 firms. The compensation data were the average for all workers holding the sampled type of job. The average worker could be single or married and file an itemized or nonitemized tax return. For each of these possibilities, the study imputed the average spousal and unearned income based on the state in which the firm was located, its industry, the occupation classification of the job, and the wage rate using data from the CPS and SOI. Given these characteristics and family incomes, the study computed the relevant marginal tax rate for the household. Then, using the proportions of married people and itemizing deductions, married and not itemizing, and single itemizing and nonitemizing, it was able to compute the marginal tax and the marginal "tax price" of health insurance for the average worker in each firm. The tax rate is analogous to the 32.64% marginal rate in the example above; the tax price is the 67.36% of the insurance premium that the employee would pay after the tax exclusion. The computation of the tax price allowed the study to estimate whether or not a firm offered coverage, based on the tax status of their average employee and the generosity of the coverage, if offered.

The study concluded that a 10% increase in the tax price (a cut in taxes) reduced the probability of a firm offering coverage by 3.1%. This is in the lower tail of the range of prior estimates. Thus, the tax subsidy does encourage firms to offer coverage. The study estimates suggest that it is the workers in small firms who are the most tax-price sensitive to buying coverage through their employers.

The effects of the generosity of coverage were much larger. The study estimated that the same 10% increase in the tax price would lead firms that currently offer coverage to reduce their expenditures on that coverage by approximately 11%. This is in the middle of the earlier estimates. Based on insurance theory, such reductions would likely be achieved by eliminating coverage on things that are of lesser value to employees, such as first-dollar coverage of physician services and prescription drugs and perhaps the elimination of dental- and vision-care coverage.

The tax treatment of employer-sponsored health insurance stands in marked contrast to the

treatment afforded to individually purchased coverage. Individuals are allowed to deduct for federal income tax, but not payroll tax purposes, the portion of their health insurance premiums (plus other medical expenses) that are in excess of 7.5% of adjusted gross income. This is a very modest subsidy compared to that afforded by employer-sponsored coverage.

Consider again the individual with \$45,000 in taxable income and a marginal tax rate of 32.64%. If the individual bought insurance directly from a broker and paid the same average premium of \$4,248 as in the original example, the individual would receive a tax subsidy of less than \$300, compared with nearly \$1,400 for employer-sponsored coverage. In addition, the individual would get this only if he or she itemized the tax return.

Self-employed individuals can do somewhat better. They can deduct all their health insurance premiums prior to computing their adjusted gross income. However, the deduction may not exceed their profits, and they are not eligible to claim the deduction in any month in which they or their spouse was eligible for employer-sponsored coverage.

Proposed Changes

A number of approaches have been proposed to change the nature of the tax treatment of employer-sponsored health insurance. Of course, one could simply abolish the exclusion and treat employer-sponsored health insurance as taxable employee compensation. The study described above suggested that a total elimination would reduce spending on employer-sponsored coverage by 45%, combining both the reduction in the probability that coverage was offered and the reduced generosity. However, healthcare spending likely would be reduced by considerably less than that amount because many people would pay higher deductibles and copays out of pocket.

In 2007, the Bush administration proposed a standard deduction of \$7,500 for individuals and \$15,000 for families in place of unlimited tax exclusion of employer-sponsored coverage. This deduction was to apply whether one purchased health insurance directly or through an employer. The amount of the deduction would be fixed each year regardless of how much was actually spent on

insurance as long as they bought a qualified health plan. However, no action was taken on the proposed plan.

Such a plan could change health insurance incentives in several ways. First, by limiting the size of the deduction, it would provide incentives for those with very generous plans to cut back on their health plans. Effectively, anyone with insurance premiums above the size of the deduction would receive no further tax subsidy. Second, because the size of the deduction would be available to anyone who had a qualified health plan, it would provide incentives for people to consider reducing their benefit package even if the premium was below the size of the deduction. The tax on the difference between the deduction and the premium would be a tax refund. The individual with the \$45,000 in taxable income who took the least costly insurance plan, a health maintenance organization (HMO), offered by the employer would receive a tax refund of approximately \$450. Third, because the standard deduction applied on any qualified health plan, the tax subsidy would apply to those who purchased individual coverage as well as those who purchased coverage through an employer. Thus, there would be a new tax subsidy for non-employer-based coverage. Finally, if the standard deduction were tied to general inflation rather than medical-care inflation, it would gradually reduce the tax subsidy relative to the costs of medical care.

Both before and after the Bush proposal, a number of policy experts had proposed that the tax exclusion be replaced with a refundable individual tax credit. Under the current exclusion and under the Bush proposal, the value of the tax subsidy depends on one's marginal tax rate. Those with higher taxable incomes face higher tax rates and therefore receive higher tax subsidies for purchasing health insurance through their employers. A tax credit fundamentally changes this. The recipient of a tax credit receives a reduction in tax liability in the amount of the credit. Thus, a \$1,000 tax credit reduces one's tax liability by \$1,000 regardless of one's marginal tax rate. A refundable tax credit allows one to receive the full tax credit even if one's tax liability is less than \$1,000. Moreover, because the tax credit would not be tied to employer-based coverage, it would be available to those who purchased nongroup coverage.

Advocates tend to favor such a general tax credit for several reasons. First, because it expands the tax subsidy for purchasing coverage to all individuals, not just those with employer-sponsored coverage, more people would be likely to buy coverage. Second, because the tax subsidy does not increase with income, it reduces the incentive for those in higher tax brackets to shift more of their income into more generous health insurance plans. Third, in principle, a tax credit could be tailored to the health status of recipients, thereby providing larger subsidies to those with substantial health problems.

In addition to the replacement of the tax exclusion with a general tax credit for the purchase of health insurance, some have proposed targeted refundable tax credits for those with incomes below some level. The argument is one of providing a subsidy to the targeted group to allow them to buy coverage in the private market.

Changes in the tax treatment of employer-sponsored health insurance are not without challenges. First, if nothing else is changed, eliminating its exclusion would constitute a substantial increase in taxes that would be felt by virtually all income tax payers who have employer-sponsored coverage. Second, replacement of the tax exclusion with a standard deduction or a tax credit implies potentially large numbers of winners and losers. Such shifts are always politically difficult. Finally, the introduction of a generous standard deduction or tax credit implies that the tax subsidy will be larger than the current subsidy, suggesting substantial increases in domestic governmental spending. Nonetheless, while politically challenging, reform of the tax treatment of employer-sponsored health insurance offers the potential for both a more efficient and a fairer tax and insurance system.

Michael A. Morrissey

See also America's Health Insurance Plans (AHIP); Blue Cross and Blue Shield; Coinsurance, Copays, and Deductibles; Compensation Differentials; Health Insurance; Moral Hazard; Public Policy; Regulation

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<http://www.hiaa.org>

Internal Revenue Service (IRS): <http://www.irs.gov>

Tax Policy Center: <http://www.taxpolicycenter.org>

TECHNOLOGY ASSESSMENT

Technology assessment is a form of policy analysis and evaluation that poses the question "What will be the social, economic, environmental, ethical, and political impacts of the introduction of a new technology?" In this sense, it is an analytic tool that is designed to provide decision makers with scientific information about the potential impacts of technology that might be introduced in the future. A technology assessment consists of three parts: (1) identification of problems, issues, and applicable technologies; (2) identification of relevant effects and impacts; and (3) development and evaluation/assessment of policy and decision alternatives. In the United States, one of the most important federal agencies to conduct technology assessment was the former Office of Technology Assessment (OTA). Today, several government agencies and private organizations conduct health-care technology assessment.

History

The technology assessment movement of the 1970s grew out of the history of trying to link the research and policy-making communities.

Technology assessment is a form of systems analysis that attempts to apply rational, systematic approaches to an area of public policy. Specifically, technology assessment represents a class of policy studies that systematically examines the effects on society that may occur when a technology is introduced, extended, or modified, with special emphasis on those consequences that are unintended, indirect, and delayed.

Technology assessment is known for its focus on not limiting impact studies to first-order consequences (e.g., the effect of canceling the Clinch River project on the nuclear power industry) but, instead, concentrating on discovering and predicting as many second- and larger-order effects as possible (e.g., environmental impacts of breeder reactors, the effects of research and development on the other breeder reactor technologies).

In other words, technology assessment represents a new form of evaluation that will allow officials to estimate (forecast) what the consequences of their potential actions are likely to be; as such, technology assessment represents an especially attractive source of expertise within a political environment in which decisions are made through bargaining and minimization of risks.

Office of Technology Assessment

Future-oriented systems analysis became very popular in scientific and government circles in the 1960s and 1970s. In recognition of the importance of this type of analysis, the U.S. Congress created the OTA in 1972 (PL 92–484). This office was designed to provide the Congress with the best scientific and technical information available on emerging technologies. This information was to be presented in a form that was understandable to lay audiences. During its 24 years of existence, the OTA produced 750 studies on a wide range of topics, including healthcare, acid rain, global climate change, and many new technologies that were being introduced (e.g., imaging medical equipment such as CAT scanners, and MRIs).

When the original bill was being drafted for the creation of the OTA, the staff of the House Science and Technology Committee took the tenets of technology assessment methodology quite seriously. The board overseeing the operations of the OTA would consist of citizens, representatives of

industry, scientists, and members of the U.S. Congress. However, Congress would not maintain the majority of votes on this board. The theory was that all stakeholders should have equal representation; and Congress was simply one stakeholder.

Clearly, as the history of the OTA indicates, this plan was fine in theory but inconsistent with the realities of politics. This original bill was not acceptable to Congress. If Congress was to have full trust and confidence in this body, then it should also control it. Furthermore, Congress argued that if the results of the OTA studies were to be useful to it, then Congress should also set and control the research agenda. Citizens, and other public representation, were important, but they should be on agency advisory councils or on project advisory committees.

When Harold Brown (then President of the California Institute of Technology) resigned as the first chairman of the OTA's Advisory Council, the strains between researchers/technicians and politicians over the creation of the OTA were evident. In his letter of resignation, Brown noted that few members on the council were satisfied with what had been accomplished, compared with what was hoped for and possible. Specifically, Brown felt that the OTA had failed to provide an early warning system for Congress so that it could consider the social and other impacts of technological advances. He blamed this failure on the tendency of the OTA to squander its energies on routine tasks for congressional committees. The OTA, according to Brown, should be in the position of turning down committee requests, particularly those that did not call for technology assessment but rather sought technical feasibility studies, reviews of existing programs, and literature searches—jobs that might be better performed by other research agencies with greater resources.

Presumably, the tendency to respond to short-term committee needs would not have been as prevalent under the original conception of the OTA first proposed by the House Science and Technology Committee staff. At the same time, Congress would not have supported this version of an OTA. In 1972, when the OTA was created, Congress was concerned with creating some of its own analytic capabilities that would provide information independent of the executive branch. However, Congress did not want to be responsible

for creating large, unwieldy bureaucracies. For example, Texas Democratic Congressman Olin E. Teague, Chairman of the House Science and Technology Committee and one-time chairman of the OTA board, indicated that the OTA was always supposed to be a contract operation with a small but highly capable in-house staff. Teague believed that OTA would not have been created without these assurances.

When the 104th U.S. Congress withdrew funding for the OTA, it had a full-time staff of 143 employees with an annual budget of \$21.9 million. The OTA closed on September 29, 1995.

At the time when the OTA was most active, there was also the creation of technology assessment capabilities within many executive branch agencies—most notably with the U.S. Departments of Commerce, Agriculture, and Energy, as well as the creation of the National Science Foundation Program designed to sponsor and develop technology assessment methodology.

The Professionalization of Technology Assessment

The development of technology assessment as a methodology was accompanied by the creation of several professional associations and groups of researchers and technicians who were promoting the technology assessment movement.

From a strictly methodological perspective, technology assessment represents an information resource that, by design, requires the following: boundary spanning and coordination among various disciplines; multidisciplinary work; a coordinated, planned, exploratory approach that is structured to acknowledge the uncertainty of the task; and the conscious and planned involvement of all parties who might be affected (stakeholders) by the adoption of the technology under study.

Each of these facets of technology assessment raises fundamental questions about control, institutional responsibility, and coordination; yet, from the perspectives of researchers, each is critical for attempting to provide the comprehensive analyses at the heart of the technology assessment movement. If they are to be translated into institutional terms, technology assessments would seem to implicitly require coordination at the inter- and intra-organizational levels. However, bureaucrats

traditionally have resisted this form of coordination. There have been attempts made at creating lead agencies, which are responsible for coordinating a particular substantive task in government (e.g., coordinating career-planning research). Interagency task forces have also been experimented with. Except for times of crisis, this type of coordination has encountered severe problems, which ultimately have led to failure.

However, as already outlined, the technology assessment movement represented a potentially powerful and useful tool for government officials. This is especially true given the pressure that is being put on government officials to reform their day-to-day operations by being more rational—in a formal, scientific sense of the term; using scientific information—or at least using the results of research funded through public funds; and relying considerably less on intuition than officials have been inclined to do in the past.

Technology Assessment as a System of Analysis

As it evolved, technology assessment was not just another form of research output or a bit of social science knowledge but is instead a system of analysis designed to inform the public-policy-making process.

System of analysis can be thought of as both formal and informal. The critical (essential) distinction between systems of analysis and more routine knowledge or information is that a system of analysis is associated with a set of general rules, procedures, and processes that guide the production of the end product. In recent history, examples of these kinds of systems have included the Program-Planning-Budgeting System (PPBS), the Environmental Impact Statement system, and the attempts by some federal agencies to build a routinized survey capacity into their policy-making process.

Technology assessment, as a system of analysis, is based on a general process that provides a systematic and rational input to societal decision making and management. These particularized policy studies attempt to account for direct and indirect effects as well as indirect and delayed impacts involved with technological change. To this end, technology assessment brings together multidisciplinary approaches, recommendations,

and the perspectives related to a new technological development. Although there is no single methodology common to all technology assessments, there are a number of common or generic elements involved in the creation of virtually every comprehensive technology assessment. When a decision maker reads a technology assessment, he or she can expect that each of these elements or perspectives has been taken into account and is documented in the technology assessment study.

It is important to distinguish systems of analysis from other, more routine information, whether generated in-house or sent to the organization free of charge, because the process that accompanies the creation of a technology assessment, which ensures the introduction and reporting of many different perspectives, may be just as important in understanding the ultimate impact of this class of policy studies on decision makers as the substance of the study itself.

Other Systems of Analysis

Technology assessment is not the only form of policy analysis or evaluation that represents a system of analysis. At the same time that technology assessments were becoming popular, environmental impact statements were also being developed and were also seen as attractive by government officials, because they know what to expect; they know the form (generally defined) in which they will receive the information; each environmental impact statement contains specific kinds of information and/or covers (accounts for) a set of perspectives; and there are few unexpected results that emerge from an environmental impact statement because of the process that was followed (i.e., set of procedures predetermined by the bureaucracy) in creating the environmental impact statement.

Future Implications

In the future, technology assessments, especially in healthcare, will likely increase and become a more important factor in evaluation. As new, enormously expensive medical equipment and drugs are introduced, federal and state governments, insurance companies, and consumers are increasingly questioning their value. Although the federal OTA no longer exists, other federal government agencies

currently conduct healthcare technology assessments (e.g., National Institutes of Health [NIH] and the Food and Drug Administration [FDA]). Furthermore, several private associations (e.g., Blue Cross Blue Shield Association [BCBSA], and the University HealthSystem Consortium [UHC] also conduct technology assessments for their members. Outside the United States, the best-known organization that conducts healthcare technology assessments is the United Kingdom's National Institute for Health and Clinical Excellence (NICE).

Robert F. Rich

See also Cost-Benefit and Cost-Effectiveness Analysis; Cost of Healthcare; Genetics; Health Economics; Public Policy; Quality of Healthcare; Rationing Healthcare; United Kingdom's National Institute for Health and Clinical Excellence (NICE)

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Web Sites

- Blue Cross Blue Shield Association (BCBS), Technology Evaluation Center (TEC): <http://www.bcbs.com/blueresources/tec>
- National Information Center on Health Services Research and Health Care Technology (NICHSR): <http://www.nlm.nih.gov/nichsr>
- United Kingdom's National Institute for Health and Clinical Excellence (NICE): <http://www.nice.org.uk>
- U.S. Office of Technology Assessment Archives: <http://fas.org/ota>

TELEMEDICINE

Telemedicine is the application of clinical medicine through the exchange of medical information from one site to another via electronic networks to improve patients' health. The number of existing telemedicine networks in the United States is approximately 200, and it involves nearly 2,000 medical institutions throughout the nation. Furthermore, it is estimated that about half, or nearly 100, of the telemedicine programs are actively providing patient care services on a routine daily basis. The American Telemedicine Association (ATA) reports that the total amount of federal grants and contracts for telemedicine is about \$270 million. More than one third of these funds are for research contracts with the U.S. Department of Defense (DOD), which allow for equipment and service delivery.

Overview

An elderly female patient presents at a rural hospital with cardiac problems and depression. The medical staff at this hospital prescribes a course of therapy for her heart troubles, and the patient is seen for regular, routine follow-up visits with a cardiologist. However, there is no psychiatrist on staff at this small facility. To ensure that the patient's depression, a serious comorbidity which can exacerbate the heart problems, is properly treated, the physicians connect her with a home-monitoring service. Every quarter, the service rings the patient and administers a telephone-based, interactive voice recording (IVR) screening using a health questionnaire as a way to monitor the patient's mental status.

A study by Carolyn Turvey and colleagues at the University of Iowa, whose parameters were outlined above, indicated that 90% of patients completed this telemedicine screening. The researchers found that a regular telephone IVR screen for depression could be used in a standard illness protocol. This program could potentially serve as a model for incorporating technology in the management of chronic illness with comorbid depression.

Chronic illnesses, like depression, account for most of the healthcare expenses in the United

States. Cutting-edge telemedicine projects like the one described above are increasingly being developed to decrease the burden of these illnesses on the medical system, to treat comorbidities, and to improve patient care and outcomes.

The term *telemedicine* appears frequently in news media reports and is often mentioned at medical conferences. Although telemedicine is not yet recognized as a separate medical specialty, technologies used for telemedicine are often part of a larger investment by healthcare institutions in either information technology or the delivery of clinical care. The new technologies involved in the practice of telemedicine include IVR, videoconferencing, transmission of still images over the Internet, online patient portals, remote monitoring of vital signs, and continuing medical education delivered online.

For clinical care, there are several applications of telemedicine that are becoming well established. Some of the applications include referral to a specialist, consultation with a patient, remote monitoring, networking hospitals, continuing education, and consumer education.

Referral to a specialist typically occurs when a specialist assists a general practitioner in arriving at a diagnosis. This often involves a patient seeing a specialist over a live network. But it can also happen with transmission of diagnostic images and/or video along with patient data, for later viewing by the specialist. Radiologists make the greatest use of telemedicine, with thousands of images read by remote providers each year. Other major specialties that rely on telemedicine include dermatology, ophthalmology, psychiatry, cardiology, and pathology. According to reports and studies, almost 50 different medical subspecialties have successfully used telemedicine.

Using telecommunications, which includes audio, still or live images, or the Internet, a primary-care health professional can consult with a patient to render a diagnosis and develop an appropriate treatment plan. Devices can be used to remotely collect and send data to a monitoring station for interpretation. The home-based applications may include the collection of vital signs, blood pressure, and blood glucose levels, an EKG, or an array of other health indicators. These services can be used to supplement visiting nurses.

Networking hospitals involves linking urban hospitals and clinics with clinics and community

health centers in suburban and rural areas. These networks include dedicated high-speed lines or the Internet for telecommunication links between sites. Additionally, this involves linking primary-care providers, specialists, and nurses with remote patients over single-line telephone-video systems for interactive clinical consultations. This can be used for monitoring of cardiac, pulmonary, or fetal signs. Generally, conventional telephone lines are used to communicate directly between the patient and the center. Using point-to-point private networks, hospitals and clinics also deliver services directly or contract out specialty services to independent medical service providers at ambulatory-care sites. These include specialties such as radiology, psychiatry, and even intensive-care services.

Using the Internet, physicians and other healthcare professionals can receive continuing medical education credits. For example, Harvard Medical School offers courses online for physicians for \$20 or less per class.

In terms of consumer education, using online access, consumers may seek out specialized health information and participate in online discussion groups that provide peer-to-peer support for conditions such as cancer and cancer aftercare.

Investment in Telemedicine

Spending on telemedicine in the United States involves both the private and the public sector. The expenditures for telemedicine are composed of three segments: grants for demonstrations and research, direct telemedicine services by federal agencies for covered populations, and reimbursement for remote medical services under Medicare. Although the amount of spending on telemedicine services provided directly by federal agencies is not tracked, the Veterans Health Administration (VA), the largest provider of remote medical services, delivers annually approximately 350,000 patient services remotely. Other federal providers of direct services include the Department of Defense, the Indian Health Service (IHS), and the Bureau of Prisons in the Department of Justice.

Medicare spending for telemedicine is also not accurately tracked. According to the ATA, the largest source of Medicare expenditures for telemedicine is for teleradiology. A Medicare program supporting videoconference-based patient services

in nonmetropolitan areas is rapidly growing, but it reimburses less than \$1 million a year. Medicare reimburses services for remote cardiac monitoring services, and in some areas for telepathology, and remote screening for diabetic retinopathy. Home telehealth applications fall under Medicare's prospective payment system (PPS) and may be used as part of a patient's plan of care, although no specific Medicare funds may be used to pay for home telehealth delivery.

Limited Growth and Acceptance

Telemedicine has slowly emerged from the fringes of medicine to mainstream use. However, there are still concerns among advocates about its pace of growth and general acceptance. Studies have clearly shown that telemedicine can increase the availability of healthcare services, decrease the amount of travel and related expenses, and enhance patient outcomes. Thus, with all these advantages, the slow take-up of telemedicine poses a dilemma.

Despite a 40-year history and the past 10 years of intensive activity, telemedicine is neither a household word nor secure in clinical use. It is estimated that less than 300 nonradiology programs are in use, with some ceasing operation each year.

Several factors contribute to the slow growth of telemedicine. First, there are reimbursement issues, concerns over whether physicians will be paid for their services rendered online rather than in person. This issue could be remedied if the patients paid for these services. However, there are other issues as well. There are concerns in the medical community about practicing virtual medicine across state lines and whether or not this is legal. Finally, the technology for telemedicine is somewhat complicated. Although physicians are technical specialists, they may not be computer specialists, which may limit the acceptance of telemedicine.

It has been noted that the slow pace of change in medicine is not unusual. The adoption of electronic health records has also been a slow process, despite its touted utility and long history.

There are several possible ways to facilitate the adoption of telemedicine technology. For example, standardization of the technologies and applications could be required by the federal government

through regulation, perhaps through additions to the Health Insurance Portability and Accountability Act of 1996 (HIPAA), which mandates privacy of personal health records. There could also be federal and state financial incentives for hospitals and healthcare providers to adopt the technology, including tax reductions. Last, the Medicare program could announce a major spending program on telemedicine technologies, which would influence technology markets in the nation. Ultimately, the use and transformation of telemedicine may be a public policy decision even broader in scope than those envisioned. Some researchers have indicated that the public health benefits of telemedicine are so great that they justify a massive expansion of the investment in the field. The public health concerns raised by the global war on terror and homeland security concerns are becoming drivers of spending in this area. This is particularly salient with the concerns about domestic biological or dirty bomb attacks on American civilian populations.

Currently, most disease reports received by state public health departments originate from clinical laboratories. It has long been recognized that the paper reporting methods used in public health surveillance are unreliable and tremendously slow, which leads to late submission of reports and substantial underreporting of communicable diseases. A recent project undertaken by researchers at the Indiana University medical school automated the reporting of diseases to local public health authorities from clinical laboratories. Reports are sent out overnight and disseminated much more quickly than paper or fax-based transmissions. When an outbreak of shigella occurred in Indianapolis, the electronic reporting system was able to notify public health officials much earlier with greater information.

Imagine the implications of such a telemedicine system in the event of a terrorist biological attack on a major urban public transportation system. The information about this occurrence could be disseminated quickly, including information on the type of attack, the means of detonation, and the type of biological agent involved—and it could be used to prevent further attacks using the same techniques.

Gene J. Koprowski

See also Access to Healthcare; E-Health; Electronic Clinical Records; Emergency and Disaster Preparedness; Health Communication; Health Informatics; Rural Health; Vulnerable Populations

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- Association of Telehealth Service Providers (ATSP):
<http://www.atasp.org>
- Canadian Society of Telehealth (CST):
<http://www.cst-sct.org/en>
- International Society for Telemedicine and eHealth (ISFTEH): <http://www.isft.net>

TERRORISM

See Bioterrorism

THOMPSON, JOHN DEVEREAUX

Familiarly known as Tommy, John Devereaux Thompson was a nurse, health administration educator, and health services researcher. Thompson along with Robert B. Fetter developed Diagnosis Related Groups (DRGs) as a tool to standardize hospital cases for studies of quality and cost, subsequently changing the way the

nation's hospitals were reimbursed when Medicare adopted DRGs for its prospective payment system (PPS). Thompson's passions for studying the history of hospital operations as well as nursing resulted in a creative and respected book that focused on the social and architectural history of hospitals.

Born in Franklin, Pennsylvania, Thompson was raised in Canton, Ohio. Thompson's stepmother, a nurse, encouraged him to also become a nurse. Following her advice, he completed his nurse training program in 1939. With World War II imminent, he enlisted in the U.S. Navy and served as a pharmacist's mate, eventually achieving the rank of warrant officer. After the war, he enrolled in the City College of New York in 1948, working nights as a nurse riding ambulances and doing psychiatric nursing. Thompson received his bachelor's degree with distinction in business. Subsequently, he enrolled in the new hospital administration program at Yale University and undertook the required administrative residency training at Montefiore Hospital in New York City. Thompson completed this praxis experience in 1950 and remained at Montefiore Hospital for 6 years, becoming one of the hospital's assistant directors. Albert W. Snoke, then director of the hospital administration program at Yale and senior administrator at the then Grace-New Haven Hospital, had received a federal Hill-Burton grant to study hospital function and design, and he was successful in recruiting Thompson back to Yale in 1956.

Thompson's directorship of the hospital administration program at Yale University was novel in its emphasis on public health, yielding students who recognized that their actions as health services managers must be related to improving the health status of communities. He was beloved as a teacher and mentor.

Much of Thompson's research was based on his underlying philosophy that clinical and administrative data must be brought together to identify and solve both operational and financial problems. Thompson was instrumental in creating the Connecticut Hospital Information Management Exchange (CHIME), one of the first of 34 statewide databases built from hospital billing systems that form the foundation of large data sets, which are often used for health services research.

Thompson studied operations research with Russell A. Nelson and Charles D. Flagle at the Johns Hopkins University School of Engineering. This interest in data and their use for management decision making as well as for policy formulation and analysis led Thompson to develop a research and teaching relationship with Robert B. Fetter, then in Yale University's Department of Administrative Sciences. With others, they were important in developing the Center for Health Services Research in Yale University's Institute for Social and Policy Studies; the Center was among the first in the country.

Thompson's published articles include topics such as hospital operations, including nursing services and nursing intensity, hospital function and design, application of operations research to hospital studies, costs of care, economics of care, education for health services administration, emergency medical services, chronic hemodialysis, the role of schools of public health, hospital architecture, case-mix cost accounting, regulation, DRGs and hospital prospective-based payment, quality appraisal, and cost funding.

Thompson epitomized the adage "He who dares to teach must never cease to learn" (Anonymous). Thompson received numerous awards and honors. He shared the Baxter Prize (now the William B. Graham Prize for Health Services Research) with Robert B. Fetter in 1992; this award is the highest distinction that health services researchers can achieve. Various awards have also been named in his honor, including the John D. Thompson Prize for Young Investigators, sponsored by the Association of University Programs in Health Administration (AUPHA), and the John D. Thompson Distinguished Visiting Fellow at the Yale University School of Public Health. In addition, the teaching arm of the Connecticut Hospice was named after him—the John D. Thompson Hospice Institute for Education, Training, and Research.

David A. Pearson

See also Association of University Programs in Health Administration (AUPHA); Diagnostic Related Groups (DRG); Medicare; National Association of Health Data Organizations (NAHDO); Payment Mechanisms; Prospective Payment

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TIMELINESS OF HEALTHCARE

Timeliness is one of the six key dimensions of healthcare quality identified by the National Academy of Sciences, Institute of Medicine (IOM). Timeliness can be defined as the healthcare system's capacity to provide care quickly after a need is recognized. Timeliness is a measure of a continuum ranging from an intervention that is too early, in which the diagnosis cannot be made, through a delayed intervention, in which treatment may no longer be effective. There are many reasons why timeliness as a quality measure is critical to the effectiveness of a well-functioning healthcare system, and a great deal of research exists showing its positive and negative repercussions on emergent, urgent, and chronic conditions as well as preventive services. There are also many direct and indirect factors that play a significant role in the aspect of timeliness, including cost, proper access to medical resources, and even individual patient attributes.

There has been increasing attention given to this topic in recent years, and thus, there has been a shift in ideology and the organization of hospitals, primary-care offices, and public health departments to continually improve the timeliness of healthcare.

Benchmarks

Many benchmarks are valuable in the evaluation of timeliness of healthcare, including morbidity, mortality, cost, and patient satisfaction. Quality assurance programs in ambulatory-care and emergency department settings are increasingly implemented and used to monitor timeliness assessments. This is important not only to observe and improve patient outcome data but also to give attention to the service aspects of the healthcare industry. For example, patient visits may be evaluated by the length of wait times, and no-show rates. Wait times, in particular, may be monitored closely as patient satisfaction decreases as perceived wait times increase. Many benefits such as the shorter duration of illness, the decreased likelihood of complications, reduced anxiety on the part of the patient, and reduced activity limitation are linked to receiving timely care.

Contributing Factors

Many contributing factors may affect the aspect of the timeliness of healthcare on multiple levels and points of intervention. These contributing factors, in turn, could have, separately, or in conjunction, large ramifications on the outcomes of care. For example, transportation to and between medical facilities can have a large impact. Ease of scheduling an appointment within a given target time is also essential. In addition, patient individual characteristics such as age, gender, and race may play a role in the diagnosis of some chronic conditions. Attributes such as good communication skills, motivation, positive attitude, good learning capacity, and willingness to seek timely care may be critical factors that result in the early diagnosis of illnesses. The significance of provider judgments in accurately assessing the severity of the presenting problem and patient prognosis has been shown to affect outcomes. After diagnosis, efficient communication within and among providers and medical establishments also play a decisive role in outcomes of care.

These aspects include timely documentation, reliable physician orders, ease of referral, clear prescriptions, and assurance of patient follow-up. Communication between the medical establishment and the public health system is paramount. Timely physician reporting of communicable diseases, obviously, could have far-reaching consequences. Articulation of established clinical practice guidelines and public health initiatives to medical practitioners is also very important. Of course, there are a vast number of contributing factors that should be considered in the evaluation of timeliness within the medical and health systems; however, all influence, ultimately, efficiency, precision, and patient flow.

Range of Medical Settings

The critical nature of the timeliness of healthcare spans the range of care provided within the United States, including emergency department visits, surgical procedures, primary-care visits, specialty-care visits, and public health initiatives. Some research has shown that as many as half of all hospital emergency department visits in the nation are for nonurgent care. This is notable as it illustrates the possibility of emergency department congestion threatening timely care for urgent cases and demonstrates the importance of access to healthcare services. Studies have found that Medicaid patients in urban areas (who are often not accepted by many primary-care offices) are more likely than others to seek nonurgent care at hospital emergency departments.

Timeliness is also a critical aspect in primary healthcare. However, a growing number of individuals are delaying their care because of its cost. The National Center for Health Statistics (NCHS) estimates that about 7.7% of the nation's population in 2005–2006 delayed receiving care because of its cost, up from 6.9% of the population in 1997–1998. This can have devastating effects on patient care, especially in consideration of chronic disease states for which proper care also involves timely specialist referral and ready access to care. For example, a late evaluation by nephrologists of patients with chronic kidney disease results in a significantly greater burden and severity of comorbid disease and a shorter duration of survival. Lack of health insurance plays an important role in individuals delaying care.

As increasing attention is placed on the significance of timeliness, healthcare organizations are changing to address it. In particular, clinical practices are converting to more flexible scheduling systems that allow for a greater number of walk-in appointments and same-day scheduling. These alternative models are sometimes referred to as the carve-out model and the advanced-access model and are being shown to provide more patient satisfaction, shorter wait times, and lower no-show rates. The advanced-access model also creates the possibility for the preservation of the continuity of care. This is of note as the ability of the provider and patient to establish a consistent and reliable relationship has a great impact on the quality of care, in particular the measure of timeliness.

Future Implications

Timeliness is critical to the effectiveness of a well-functioning healthcare system, in particular emergent, urgent, and chronic conditions as well as preventive measures at multiple levels of intervention. There is increasing attention being given to this topic, including major shifts in ideology and organizations to continually improve this measure as the nation strives toward improving the quality of care within the healthcare system.

J. Andrew Dykens

See also Emergency Medical Services (EMS); Equity, Efficiency, and Effectiveness in Healthcare; Joint Commission; National Healthcare Quality Report (NHQR); Patient Safety; Quality Management; Quality of Healthcare; Transportation

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- Joint Commission: <http://www.jointcommission.org>
- National Quality Forum (NQF): <http://www.qualityforum.org>

TOBACCO USE

Tobacco use is one of the biggest public health challenges of the 21st century. It is the single most preventable cause of disease and death. It is estimated that worldwide tobacco use causes about 4 million deaths a year. And the number of deaths caused by tobacco use is expected to rise to about 8.4 million by 2020.

Tobacco use imposes a significant burden on society. People who use tobacco in its various forms face multiple health risks. Moreover, they impose a heavy burden on society by increasing the nation's medical expenditures of treating many costly tobacco-related diseases as well as through an enormous loss in productivity. Sustained public policy efforts, as well as the provision of cessation counseling as a part of routine healthcare, may contribute to the decline of tobacco use in the United States.

Background

The use of tobacco as a stimulant goes back many thousands of years. It is estimated that the cultivation of the tobacco plant began as far back as

6000 BCE in the Americas. The indigenous people of the Americas were using leaf-wrapped cigarettes long before the arrival of Columbus, and from the late 1400s onward, tobacco was used in various other forms such as cigars and pipes, snuff, and chewing tobacco. However, it was not until the 1880s, when the first cigarette-making machine was invented in the United States, that natural-leaf cigarettes made from domestic tobacco began to dominate the consumer market. This development led to machine-rolled butts replacing the hand-rolled varieties, consequently making cigarettes more affordable and thereby more accessible. By World War I, cigarettes had become immensely popular, and troops in both World Wars I and II used smoking as a means of relieving the physical and psychological stress of war.

Public Health Challenge

Smoking continued to gain widespread public acceptance until 1964, when the first U.S. Surgeon General's report on smoking and health brought to the fore the many health risks associated with tobacco use. Although tobacco use has declined by more than 50% since the initial Surgeon General's report, there are still more than 40 million smokers in the United States. Tobacco use in the nation generally begins in early adolescence, and the earlier young people begin using tobacco, the more heavily they are likely to use it as adults. The addictive properties of nicotine ensure that many adolescent smokers will become regular users of tobacco as adults, leading to the eventual development of chronic health problems.

In the general population, tobacco use is associated with many diseases such as cancers of the lung, throat, pharynx, and esophagus and contributes to the development of cancers of the pancreas, cervix, kidney, and stomach. It is also associated with chronic bronchitis, emphysema, and chronic obstructive pulmonary disease (COPD). Specific to female smokers are health risks such as primary and secondary infertility and delays in becoming pregnant. With respect to pregnancy outcomes, women who smoke are at increased risk of premature rupture of membranes, low-birth-weight babies, and preterm delivery. Smoking is also a major cause of coronary heart disease among women.

Economic and Social Costs

Tobacco use not only imposes a heavy toll on health, but it also is associated with a significant economic burden by way of medical expenditures and the loss annually of billions of dollars in lost productivity. Coupled with the high medical costs of treating diseases caused by tobacco is the lost productivity from the shortened lifespan of those who use tobacco regularly. Tobacco users are also less productive while they are alive due to increased sickness and absenteeism from work.

Smokers impose costs on society that are distinct from their private costs of using tobacco. These costs include costs borne by families of tobacco users, health costs borne by governments, and the costs of environmental tobacco smoke. Smokers impose direct health costs on nonsmokers, such as low-birth-weight babies born to mothers who smoke during pregnancy. Furthermore, nonsmokers who are chronically exposed to secondhand smoke are at increased risk of diseases such as asthma and lung cancer along with other adverse health effects. Nonsmokers also end up bearing, at least partially, the higher medical costs incurred by smokers through smokers' increased use of medical-care facilities. Most medical care in the United States, specifically care associated with hospital treatment, is financed through public and/or private health insurance programs. Unless smokers contribute to these financing mechanisms by paying differentially higher insurance premiums or taxes, nonsmokers are in effect partly subsidizing medical care for smokers.

Control Measures

While smoking has been identified as a serious health hazard among healthcare professionals, economists and policymakers are still debating the many aspects of tobacco control measures, including the economic costs and benefits of tobacco consumption, the relative merits of different methods of tobacco control, and how efficient and equitable they prove to be. In the past, efforts were focused on individual-level interventions, such as clinical and small-group interventions. However, current tobacco control measures focus more on population-level strategies,

such as normative change of the social acceptability of tobacco use, higher taxes on cigarettes, advertising and marketing restrictions, countertobacco marketing, prevention and cessation services, media campaigns, and other policy and legislative actions. The shift from individual- to population-level interventions has occurred not only because of the realization that large-scale change can only be achieved through concerted public policy efforts but also because of the growing awareness of the rights of nonsmokers.

Niranjana Kowlessar

See also Causal Analysis; Epidemiology; Mortality, Major Causes in the U.S.; Preventive Care; Public Health; Public Health Policy Advocacy; Public Policy; World Health Organization (WHO)

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- Centers for Disease Control and Prevention (CDC): <http://www.cdc.gov>
- World Health Organization (WHO) History of Tobacco: <http://www.who.int/tobacco/en/atlas2.pdf>

TRANSPORTATION

There are many forms of transportation available to transport the ill, the injured, and the disabled to and from various healthcare facilities. Medi-vans, helicopters, and ambulances are some of the ways by which patients are transported to receive needed healthcare. The lack of access to reliable individual and public transportation, however, continues to be one of the largest and most widely recognized barriers to receiving healthcare in the United States. Although patients no longer have to rely on physicians to make routine house calls, rural residents, minorities, the elderly, children, and the indigent are more likely to experience travel burden or transportation barriers to healthcare.

Overview

Studies have shown that people with a driver's license have two and a half times more visits for chronic care and almost two times more visits for regular check-up care than those who do not have a driver's license. Additionally, people with access to affordable public transportation have four more chronic-care visits annually than those who do not. Transportation barriers have also been linked to lower rates of preventive care, compliance with treatment regimens, and accessing emergency care. In 2006, it was estimated that 3.2 million people (4% of the population) either missed a scheduled visit or did not schedule a visit to a healthcare provider because of transportation issues. This estimate increased to 7% for families with an income of less than \$50,000 per year.

Urban areas in the United States have tremendously benefited from the vast amounts of healthcare resources available, ranging from ambulatory and air transportation to a choice of medical facility.

Although efficient transportation services in urban areas allow those with an emergent condition to choose from various acute-care facilities, many more individuals fail to receive adequate transportation to even primary healthcare. Urban health departments are using multi-million-dollar government grants to coordinate emergency transportation for thousands of people to receive medical care in the event of a mass casualty; however, more than half of some rural residents cannot find any transportation to receive immediate medical care. Furthermore, if transportation becomes available, many still cannot afford to pay for it.

Inaccessibility

While transportation has certainly eased the suffering of many, it is still an inaccessible resource to many—namely, the elderly, children, minorities, the indigent, and the rural population. The elderly use a variety of transportation methods to access the healthcare system, including driving themselves, depending on someone else, or using public transportation. Due to health problems with aging, the elderly may be unable to access healthcare because of travel burdens.

For children, the lack of transportation may mean missing out on routine medical care such as immunizations and well-child care, in addition to the increased suffering from chronic illness. Because children miss out on routine medical care, they are often transported to emergency rooms when the need for care is urgent—resulting in an increased use of emergency rooms and hospitalizations. These emergency room visits may be prevented with better access to transportation to primary care. As late as 2001, one in five children living in families at or below the poverty level in the United States was unable to access routine medical care due to the lack of transportation. (Though Medicaid recipients are entitled to transportation to receive care, many are unaware of this benefit.) Additionally, almost 50% of families reported that public transportation was not a viable option to travel to medical facilities. In rural areas, this figure was almost 75%.

Racial and ethnic minorities also have a greater likelihood of experiencing transportation barriers to healthcare. Minorities are more likely to use public transportation and travel longer distances than Whites.

The lack of transportation is not merely an option for people without any means of accessing medical care. Transportation becomes a large barrier for people with few financial resources. For the indigent, timely, reliable, and affordable transportation to healthcare can be difficult.

Rural residents are more likely than urban residents to experience travel burden or transportation barriers. This is the case because there are not as many healthcare facilities located in rural areas, and therefore residents must generally travel farther to receive their care. It is not uncommon for families to travel 20 miles or more to receive their primary care in rural areas. Rural areas also typically lack public transportation systems. It has been shown that as the distance traveled increases, healthcare utilization decreases. Because of transportation barriers, people in rural areas access healthcare at later stages of illness and, as a result, have poorer outcomes. Furthermore, many individuals in rural areas are unable to access any care, or they have to wait for a long period of time, resulting in a decline of health status. Public health and medical prevention and intervention efforts rarely reach rural areas because they are so difficult to get to. Additionally, even when present, healthcare providers have limited access to needed resources to modify lifestyles.

Future Implications

Transportation options are pivotal in opening up channels of access to healthcare. Adequate transportation to healthcare is a vital factor in access to care for a large portion of the population. If proper transportation options are not provided, it may not only make it more difficult for patients to access care, but it may also ultimately prove to be more costly for the U.S. healthcare system.

Amy Sulkin

See also Access to Healthcare; Economic Barriers to Healthcare; Emergency Medical Services (EMS); Geographic Barriers to Healthcare; Patient Transfers; Rural Health; Timeliness of Healthcare; Vulnerable Populations

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TRICARE, MILITARY HEALTH SYSTEM

TRICARE is the U.S. Department of Defense’s (DOD’s) medical entitlement program that covers eligible uniformed services beneficiaries for medically necessary care. Eligible beneficiaries may

receive care either at a DOD military treatment facility or from a TRICARE authorized civilian provider. TRICARE is the health benefit for all seven uniformed services: Army, Navy, Marine Corps, Air Force, Coast Guard, Public Health Service, and National Oceanic Atmospheric Administration.

The TRICARE healthcare program serves active-duty service members, retirees and their families, survivors, and certain family spouses worldwide. As a major component of the Military Health System (MHS), TRICARE brings together the healthcare resources of the uniformed services and supplements them with networks of civilian healthcare professionals, institutions, pharmacies, and suppliers to provide access to healthcare services while maintaining the capability to support military operations.

The plan comprises insurance and care services. The TRICARE Management Activity (TMA) unit of the DOD administers the program. Currently, the system serves 9.2 million beneficiaries at an annual cost of \$39 billion.

History

Since 1956, the DOD has been permitted to provide civilian healthcare to dependents of military service members as a result of the U.S. Congress passing the Medical Care Act. Over the years, that Act was amended, and the Civilian Health and Medical Program of the Uniformed Services (CHAMPUS) was created. As of October 1, 1966, only the family members of active-duty personnel were eligible. On January 1, 1967, retired service members and their dependents became eligible. Thus, since 1967, the DOD has funded care by civilian providers to dependents, retirees, and dependents of retirees who are under age 65 and unable to obtain access in a military health facility.

After several demonstration projects in the 1980s, the U.S. Congress and the DOD made numerous changes to the CHAMPUS Program. TRICARE was organized as a separate office under the Assistant Secretary of Defense and replaced CHAMPUS in 1994. Benefits covered under CHAMPUS are now covered under TRICARE Standard.

After 1991, the DOD began, with congressional support, moving toward managed-care arrangements under the TRICARE program that include

greater use of civilian healthcare providers even for active-duty personnel. Since then, TRICARE has undergone several restructuring initiatives, including realignment of contract regions, base realignment and closure, and the addition of TRICARE for Life benefits in 2001 for those who are eligible and TRICARE Reserve Select in 2005.

Options

For eligible persons under age 65, TRICARE consists of TRICARE Prime, a managed-care option; TRICARE Extra, a preferred provider option (PPO); and TRICARE Standard, a fee-for-service option. TRICARE partners with civilian companies, Health Net Federal Services, Inc., Humana Military Healthcare Services, Inc., and TriWest Healthcare Alliance, Corp., as well as military hospitals and clinics, to provide healthcare services and support.

TRICARE Prime is a plan similar to a civilian HMO that provides the lowest out-of-pocket cost, in return for the requirement that enrollees use only physicians, hospitals, and other healthcare providers that are part of the TRICARE network. Enrollees are assigned a primary-care physician, known generally as a “gatekeeper,” who supervises all medical care and is the one who authorizes referrals for specialty care. Active-duty and reserve service members are automatically enrolled in TRICARE Prime. However, military dependents and retirees must choose the TRICARE option that best suits their needs. Active-duty service members and their dependents have no enrollment fee. Retirees pay an annual enrollment fee and enroll for 1 year at a time.

Eligibility

TRICARE Prime is available to the following beneficiaries as long as they are not entitled to Medicare Part A and Part B due to age (65 years of age or older): active-duty service members and their families; retired service members and their families; eligible former spouses; National Guard and reserve members and their families when the National Guard or reserve member is activated for more than 30 consecutive days; retired National Guard and reserve members and their families; and Medal of Honor recipients and their families.

TRICARE Extra is the PPO. It offers choices of civilian physicians and specialists from a network of healthcare providers. It is often chosen by individuals and families whose regular physician lives too far away from a military hospital. The government shares the costs of healthcare. For using this network of preferred physicians and specialists, the government will pay an additional 5% of medical costs incurred (85% for dependents of active duty). There is no annual enrollment fee to participate in TRICARE Extra.

TRICARE Standard is the healthcare option formerly known as CHAMPUS. Eligible beneficiaries have the greatest flexibility in choosing a healthcare provider, and the government will pay a percentage of the cost. It is chosen most often by individuals and families having established relationships they wish to maintain with civilian physicians. There is no annual enrollment fee to participate in TRICARE Standard.

TRICARE for Life (TFL)

On October 1, 2001, a new TRICARE entitlement for Medicare-eligible uniformed-service retirees, eligible family members, and survivors referred to as TFL came into effect. TFL is TRICARE’s Medicare-wraparound coverage available to *all* Medicare-eligible TRICARE beneficiaries, regardless of age, provided they have Medicare Parts A and B. TRICARE acts as a second payer to Medicare. TRICARE pays the remaining out-of-pocket expenses (Medicare deductibles and cost shares) for services paid by Medicare and covered by TRICARE. Under TFL, a beneficiary will currently not pay more than \$3,000 per family per year in TRICARE-allowable expenses. After that, TRICARE pays 100%. In most cases, TFL-eligible beneficiaries have little need for other health insurance besides Medicare and TFL.

Other Coverage

The TRICARE senior pharmacy benefit provides Medicare-eligible retirees of the uniformed services, their family members, and survivors the same pharmacy benefit as retirees who are under age 65. It includes access to prescription drugs not only at military treatment facilities but also at retail pharmacies and through the TRICARE mail

order pharmacy program. The current pharmacy cost-share structure—meaning the percentage of fixed amount that the beneficiary pays toward the cost of the medication—is based on whether a prescription medication is a generic, formulary, or nonformulary pharmaceutical. The copayment is the same for all TRICARE beneficiaries (except active-duty service members, who receive medications free of charge) depending on where the beneficiaries choose to fill their prescription.

Vision Care

TRICARE vision benefits vary depending on beneficiary status (i.e., active-duty member, active-duty family member, retired service member, or retired family member) and enrollment in TRICARE Prime. TRICARE Prime enrollees aged 3 and older are authorized a comprehensive eye examination once every 2 years. Prime enrollees may receive the services from any TRICARE network provider without a referral or authorization from the primary-care manager, healthcare finder, or any other authority. If the beneficiary receives services from a nonnetwork provider that has not been authorized, the beneficiary is responsible for the entire amount of the bill. Pediatric vision screening is available at birth and at approximately 6 months of age. Diabetic patients, at any age, are allowed annual comprehensive eye examinations.

Behavioral and Mental Health

The behavioral health program now provides a locator and assistance service, which is especially helpful for those who may find it hard to locate a behavioral healthcare provider in the network. Active-duty service members must have a referral from their primary-care physician for behavioral healthcare. TRICARE Prime active-duty family members can receive the first eight outpatient behavioral healthcare visits per fiscal year without a referral, but they must receive the care from TRICARE network providers to avoid point-of-service cost-sharing charges.

Skilled Nursing

Skilled-nursing coverage typically covers the following: medically necessary skilled nursing

care, rehabilitative therapies, room and board, prescription drugs, laboratory work, supplies, appliances, and medical equipment. There are four admission criteria for skilled nursing care. First, the beneficiary must be treated in a hospital for at least 3 consecutive days, not including the day of discharge. Second, he or she must be admitted within 30 days of hospital discharge (with some exceptions) to a skilled-nursing facility. Next, a physician's treatment plan must demonstrate the need for medically necessary rehabilitation and skilled services. And finally, the facility must be Medicare certified and a participating provider.

Hospice

Hospice is available for terminally ill patients expected to live 6 months or less if the illness runs its normal course. A Medicare-approved program must provide the hospice care.

Funding and Cost Containment

In addition to revisions in military planning, nationwide changes in the practice of medicine have also affected the DOD. In particular, managed-care initiatives and capitated budgeting that are widely adopted in the civilian community are being implemented in the DOD's TRICARE program. TRICARE is also designed to coordinate the medical-care efforts of the three military departments in three geographical regions, each under a single military commander known as a lead agent. The lead agents are responsible for managing care provided by all military medical facilities in their respective regions and for contracting for additional care from civilian providers. These competitively bid, regionwide contracts represent a significant change in the delivery of defense healthcare and will, it is anticipated, result in cost savings.

The U.S. Congress, as is the case with all federal entitlement programs, determines the funding of TRICARE in the National Defense Authorization Act. The dollar amounts allocated to healthcare in the budget of the DOD have doubled during the past 5 years, from \$19 billion in FY2001 to more than \$37 billion in FY2006,

even as the size of the active-duty force has remained relatively steady. The DOD's projections for healthcare indicate that even further growth can be realistically anticipated, perhaps reaching \$64 billion in 2015. In 1990, according to the DOD estimates, healthcare expenses constituted 4.5% of its budget; by 2015 it could reach 12%. This growth in healthcare costs could have a substantial effect on spending for other defense programs and/or the overall size of defense spending within the federal budget.

There are complex considerations with regard to any of the various approaches to dealing with the growth of military medical spending. To some extent, they reflect larger healthcare issues affecting the entire country. In the case of retired service members and their dependents, most recognize a special responsibility for the nation to provide healthcare after retirement, which is an important incentive for those who follow a difficult and often dangerous career.

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See also Congressional Budget Office (CBO); Health Insurance; Health Maintenance Organizations (HMOs); Managed Care; Medicare; Preferred Provider Organizations (PPO); Primary Care

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UNCOMPENSATED HEALTHCARE

Uncompensated healthcare is care provided by physicians, hospitals, and other medical personnel *pro bono*, a shortened form of *pro bono publico*, a Latin phrase meaning “for the public good.” In 2008, about 47 million Americans lack health insurance coverage, and many of the uninsured are indigent. Their only health services come from physicians, hospitals, and other medical personnel who provide uncompensated healthcare *pro bono*. Public debate concerning the uninsured continues, so it is important to examine why medical personnel provide uncompensated healthcare, its role in American politics and beliefs about healthcare for the poor, issues in defining uncompensated care, how to estimate the amount of uncompensated care, and the future implications of uncompensated healthcare.

History

Uncompensated healthcare, and the general issue of how to care for the poor, has been an important issue in America since colonial times. Reflecting English practice and law, such as the 1601 Statute of Charitable Uses, some colonies emphasized public support for the poor. However, other colonies placed greater emphasis on each community’s need to take care of its own poor, the efforts of voluntary charities and mutual benevolent societies, and the private efforts of individual providers. The need for uncompensated healthcare grew during the 19th century, as

urbanization and immigration separated many of the poor from traditional sources of support, such as extended families, while exposing them to the health risks of concentrated urban poverty. These developments continued into the 20th century and became part of the new problem of the “uninsured” and “underinsured.”

While other nations adopted universal, government-supported medicine, the United States provided healthcare for the poor through private charity, either through institutions such as charitable hospitals or through the charity care provided by physicians and other medical providers who otherwise would be paid for their services. Throughout much of the 19th century, Americans who could afford care paid a physician to come to their home, while the poor went to hospitals or clinics (almost all of which were charitable). Hospitals were founded as charitable institutions, and many held that physicians had an ethical requirement to provide charity care, as part of their accepting the Hippocratic Oath.

Throughout, the 19th century governmental activities were limited primarily to local government (especially cities) establishing public hospitals and clinics. Many of these facilities became part of the safety net of facilities that continue to provide care to the indigent. The federal government did not expand its role in healthcare beyond providing care to merchant seamen, military personnel, and American Indians until the 20th century, when it partnered with states to pay for care to the categorically needy, such as the poor elderly. States administered these programs with

financial support from the federal government. While these programs were expanded during the Great Depression, the federal government did not assume a major role in healthcare until these categorical programs became part of Medicare and Medicaid in 1965.

The reliance on the private sector to provide charity care had several sources. American tradition since the Revolutionary War emphasized each person's responsibility to take care of himself or herself ("the rugged individual") and the belief that local governments and private charities, rather than the national government, should care for those who needed and deserved help ("the deserving needy"). The national government's role was seen during most of the 19th century as dealing with issues that involved more than one state—interstate issues rather than local or intrastate issues such as healthcare. During the latter part of the 19th century, the emphasis on private charity, donated services, and local government assumed new importance as an alternative to socialism, especially the Marxism espoused by some immigrant groups and workers' organizations.

After slowly expanding health-related programs during the Great Depression, the U.S. Congress passed the Hospital Survey and Construction Act, commonly called the Hill-Burton Act (PL 725), in 1946. This act provided federal funds to help states construct and modernize nonprofit hospitals, nursing homes, and other health facilities. These facilities were then obligated to provide a reasonable amount of charity care for 20 years afterward. The last Hill-Burton grants were awarded in 1997, and approximately 300 hospitals and nursing homes still have Hill-Burton obligations.

More recently, some states have attempted to require nonprofit hospitals to provide charity care in order to retain their tax-exempt status. Since 1986, the federal government through the Emergency Medical Treatment and Active Labor Act (42 USC 1935), commonly called EMTALA, requires that the hospitals that participate in the Medicare program provide pro bono emergency care to all patients, even if they are not Medicare beneficiaries.

Definitions

Uncompensated healthcare has many definitions, depending on the perspective of the observer. It

can be defined narrowly to mean totally uncompensated healthcare (charity or pro bono care) given by those who normally charge for their services. The American Institute of Certified Public Accountants (AICPA) requires that financial statements use this definition, and the Healthcare Financial Management Association (HFMA) recommends it. The American Hospital Association's definition of uncompensated healthcare comes close to this definition, although it includes bad debt as well as charity care. On the other hand, uncompensated healthcare has also been defined to include services provided at less than full charges, such as services to Medicaid recipients, and even services provided on a sliding scale.

The definition of the cost of uncompensated healthcare also can be restricted to the marginal cost to provide that care—the additional cost that the provider incurred by treating that additional patient, or it can be defined to include the full cost of that care, which includes the marginal cost and a share of the fixed cost. This distinction is especially important because healthcare has a substantial fixed cost, which makes the marginal cost much less than the total cost. The marginal cost of 1 day of hospital care is mainly food, linen, drugs, and the marginal cost of a physician's visit. Those costs are much less than the full cost of a day of care, which includes capital costs, salary costs, and maintenance costs. The marginal cost of an outpatient visit to a physician's office can be almost zero, compared with the full cost, which includes physician's capital costs, practice expenses, and so forth. From an accounting perspective, valuing charity care at its marginal cost is more logical when it is only a small percentage of total expenses, such as 3% (or less), versus when it is a larger percentage of total expenses, such as 10%.

These differences in definition determine not only how to measure uncompensated healthcare but also its significance in the American healthcare system. Charity care represents a true cost to the provider, a cost that represents a contribution to society. Including all services provided at less than regular charges can include services that reflect a business decision as much as good intent. A hospital might accept Medicaid recipients because they can serve as patients for its residency programs or because Medicaid's limited payments will still contribute to the hospital's total profits or surplus if it

has already covered its fixed costs. Measuring uncompensated healthcare at its marginal cost makes the care burden much smaller than measuring the care at its full cost.

Amount of Uncompensated Healthcare

The American Hospital Association (AHA) reports that community hospitals provided \$28.8 billion of uncompensated care in 2005, about 5.6% of total expenses, compared with \$3.9 billion in 1980. This change is an increase of 638% unadjusted for inflation and an increase of about 100% adjusting for general inflation. Community hospitals include both nonprofit and for-profit hospitals but exclude long-term hospitals and hospitals that provide only one type of healthcare, such as psychiatric care, rehabilitation care, or orthopedic care. Between 1980 and 2005, uncompensated healthcare ranged between 5.1% and 6% of total expenses. The percentage was constant despite economic fluctuations during this period, which included recessions and changes in the percentage of managed care. The Federation of American Hospitals reported that in 2005, the average acute-care for-profit hospital provided \$15.4 million in uncompensated healthcare.

Using data from the Center for Studying Health System Change's Community Tracking Study (CTS), which included a telephone survey of physicians, researchers found that during 2004–2005, 68% of responding physicians had provided charity care during the month prior to their participating in the survey. This estimate is conservative, however, since it includes only the charity care provided during the previous month. During that month, these physicians had provided an average of 10.6 hours of charity care, which represented 6.3% of their practice time. Surgical specialists were more likely to have provided charity care than other physicians, because they were assigned charity care by the hospitals where they have admitting privileges. Physicians in solo practice or in other physician-owned practices were also more likely to have provided charity care than physicians such as those working in hospital-owned practices. The percentage of group practice physicians who provided charity care declined with the size of the practice. In small-group practices, 78%

of physicians provided charity care, compared with 62% of physicians in practices with more than 50 physicians.

Using cost survey data from the Medical Group Management Association (MGMA), the researchers also found that 43% of group practices reported having given charity care during 2005, and the average amount of charity care was 1.7% of gross charges, or a median of \$180,000 per practice. Preliminary research by the MGMA indicates that this estimate understates the amount of charity care since some practices that reported no charity care actually provided free services but did not include the services in their financial or billing records.

In 2005, the Pharmaceutical Research and Manufacturers of America (PhRMA) helped organize the Partnership for Prescription Assistance (PPA), which provides prescription medications to patients either at no cost or at reduced cost. The American Academy of Family Physicians (AAFP), American Autoimmune Related Diseases Association (AARDA), Lupus Foundation of America (LFA), National Association for the Advancement of Colored People (NAACP), National Alliance for Hispanic Health (NAHH), and National Medical Association (NMA) also collaborate with this program. The PPA directs patients to other sources of pharmaceutical assistance such as Medicaid. It also helps consolidate assistance programs sponsored by individual drug manufacturers, some of which had been in existence for 50 years. Since 2005, the program has helped approximately 3.6 million people, and PhRMA estimates that the program has already provided billions of dollars in pharmaceuticals.

In 1999, the American Dental Association (ADA) reported that 69.7% of dentists provided free or discounted charity care. The ADA also has described the charity care individual dentists have provided and has called attention to the need to enable indigent patients to afford dental care.

The American Health Care Association (AHCA), which represents long-term care facilities, has studied the differences between Medicaid payments and the cost to provide healthcare to Medicaid patients. That study estimated that unreimbursed nursing home Medicaid allowable costs were \$4.5 billion in 2006, a 4% increase over the previous year.

Trends in Supply and Demand

As noted above, the percentage of hospital revenue allocated to charity care has remained stable over the past 20 years. However, there is evidence that charity care is becoming more concentrated in a smaller number of hospitals. Some hospitals, especially those that are not a part of the safety net of hospitals that provide healthcare to the indigent, are trimming services commonly used by indigent patients. However, safety net hospitals, especially publicly owned hospitals, will likely face increased financial pressures, while at the same time local governments may seek to avoid tax increases.

The number of physicians providing charity care also appears to be declining. Researchers have found that the percentage of physicians who provide charity care declined from 76% during 1996–1997 to 68% in 2004–2005. They attribute this decrease primarily to the decline in physicians' practice income during the period. MGMA data also show that the percentage of medical groups reporting charity care appears to be declining.

The demand for uncompensated healthcare, however, will almost certainly continue to increase. The reasons include the continued increase in the number of uninsured, increased deductibles and copayments among insured patients, and the increasing age of the nation's population. People with chronic diseases such as diabetes and HIV/AIDS are living longer, and others (especially members of the baby boomer generation) expect to be healthier longer.

Future Implications

A number of factors will likely shape the future of uncompensated healthcare in America. These factors include economic, life style, and health insurance trends, changes among healthcare providers, and the increasing use of nonphysician providers.

Economic Trends

General economic trends will be a major factor in uncompensated healthcare. The adage "It's the economy, stupid" applies to uncompensated care as well. Economic downturns increase the number of unemployed (and therefore uninsured), increase

the number of jobs that do not provide health insurance, and increase the number of workers in low-paying jobs who cannot pay for healthcare. Downturns also increase the number of people living in poverty, especially urban poverty, and the health risk factors that poverty brings. The links between poverty and illness are well established.

Life Style Trends

Preventable illnesses are becoming an increasingly large percentage of all illnesses, especially among the poor, who are the most likely to need uncompensated care. Increasing exercise alone could reduce illnesses such as heart disease and diabetes, which are costly to treat and are becoming more frequent. Yet the poor have the least access to opportunities for exercise, including health clubs and parks. Changing lifestyles, especially among vulnerable populations, can do much to reduce the need for uncompensated healthcare.

Health Insurance Trends

While the current health insurance system emphasizes choice, including the choice to have no insurance coverage, it creates coverage gaps that uncompensated healthcare is asked to fill. In recent years, deductibles (the amount that the individual must pay before the insurance starts) and copays (the amount or percentage the individual must pay after the insurance starts) have increased, and a smaller percentage of employers offer health insurance coverage. The current system leaves many poor and low-income people with no health insurance. The Medicaid system covers only the "deserving needy," such as dependent children, and in most states, Medicaid does not pay enough to encourage a large number of physicians, dentists, and therapists to accept Medicaid recipients. The uninsured poor present a substantial burden to safety net providers and to all providers of charity care. Because of this, there have been calls for universal coverage, either through a single-payer system, such as the Canadian system, or through a multipayer/universal enrollment system, such as the one found in Ireland, Japan, and the Netherlands. The poor can be included in a universal health system, or they can be included in community-based programs. Such

efforts to change the American health insurance system to a universal system have not succeeded in the past.

Changes Among Healthcare Providers

Changes among healthcare providers may also affect the amount of charity care. Physicians are moving out of solo practice into groups, which are less likely to provide charity care, and the percentage of medical practices not owned by physicians is increasing. Both of these practices are much less likely to offer charity care than physician-owned practices. Whether these trends continue will affect how much uncompensated healthcare is provided. Additionally, hospitals are increasingly becoming part of multihospital systems, although it is too early to tell what these changes mean for the provision of charity care. Not-for-profit hospitals will continue to face debates on whether their tax-exempt status requires charity care or general community benefit.

Use of Nonphysician Providers

Nonphysician providers, especially therapists, are becoming increasingly important in patient care. For example, stroke patients may need physical, speech, and occupational therapy in addition to physician and hospital care to return to normal life. Many patients also need laboratory and diagnostic procedures. Hospitals and physicians have long traditions of providing charity care. In the past, many therapists and laboratory technicians were employed by hospitals and therefore provided charity care as part of the hospital's charitable activities. However, they are increasingly practicing outside hospitals in settings without a strong charity care tradition and no legal charity care obligation. Nonphysician providers may face similar charity care decisions in the future to those hospitals and physicians already face.

Uncompensated care will likely remain an important issue as medical care continues to expand and the categories of personnel providing healthcare continue to increase. Hospitals, physicians, dentists, therapists, and other providers will have to decide how much charity care to provide, society will have to decide how much care to provide to those who cannot afford to pay, and

patients who cannot afford to pay will have to find providers that will treat them pro bono.

Steven Andes and David N. Gans

See also Charity Care; Cost of Healthcare; Free Clinics; Healthcare Financial Management; Health Insurance Coverage; Hospitals; Safety Net; Uninsured Individuals

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Partnership for Prescription Assistance (PPA):

<http://www.pparx.org>

UNINSURED INDIVIDUALS

The number of people who do not have any type of health insurance—that is, they are not covered by private policies or public programs such as Medicare and Medicaid—has been steadily increasing since the late 1970s, when the first federal surveys began asking about the coverage of individuals rather than just the head of a household. The uninsured as a percentage of the population has also been increasing. In 2006, the most recent year for which data are available, 47 million Americans did not have any type of health insurance. This was 2.2 million more people than in 2005, and it was the largest 1-year increase in the number of uninsured since the U.S. Census Bureau started collecting insurance status data in 1979. The fraction of the nation's population who were uninsured in 2006 stood at 15.8%, and among the population under age 65, 17.8%—one in six people—are uninsured.

Being without health insurance places a person at risk for potentially catastrophic expenses if he or she develops a disease, such as cancer, or a chronic medical condition, such as multiple sclerosis, or survives a major car accident or stroke. Such expenses can cause families to declare bankruptcy. Equally concerning is that the lack of health insurance can limit a person's access to healthcare. Many physicians and hospitals will not provide nonemergency services to people who are uninsured. Furthermore, people without health insurance who are treated often are not given the newer, most effective treatments, including newer pharmaceuticals, because they cost more. Thus, being uninsured involves serious risks.

Because private health insurance coverage is strongly tied to having an employer that sponsors group coverage and Medicaid coverage is tied to meeting eligibility criteria that include a low income, there are dynamic aspects to being uninsured.

Losing a job is often a trigger for losing health insurance, and likewise, changing jobs to one with a company that offers insurance can enable a person to gain coverage. Similarly, individuals can work in low-wage jobs and qualify for Medicaid, but if their employer asks them to work overtime, they can earn too much to still be eligible for Medicaid. These scenarios play out every day—people lose and gain jobs, and some lose or gain health insurance coverage, and some people lose eligibility for Medicaid, while others become eligible because of some misfortune.

These dynamics mean that over a period of time—say a year—there are people who are uninsured for part of the year while others are uninsured the entire year. Research on the dynamic aspects of health insurance coverage shows that although the median length of time that people are uninsured is about 6 months, a significant fraction (between 25% and 30%) of uninsured spells last more than a year. The implication of these studies is that surveys that ask about people's insurance situation at a point in time are not capturing the full extent to which being uninsured is a problem for people over a year or several years' time. Over the course of 2 years, the number of people who have at least 1 month without health insurance is perhaps one and a half times the number of people who are uninsured in any given week during the year when a survey may occur. Thus, the estimate of 47 million people without health insurance in any given week in 2006 could indicate that between 2005 and 2006, closer to 70 million people spent at least a month without health insurance coverage.

The dynamics of health insurance coverage point up a third risk that uninsured people face even if they are uninsured for only a short time: They may have a medical problem while they are uninsured, and then they are in trouble if they ever want to obtain self-purchased health insurance coverage. Insurers in the individual (or nongroup) market are very wary of adverse selection. In many states, insurers can reject applicants who have had medical problems, place restrictions on what medical services will be covered, or medically underwrite (i.e., increase the usual premium based on the medical history) the premium a person would have to pay. Thus, even being uninsured for a short time creates a risk for people.

Descriptions of the uninsured generally rely on annual surveys of the general population and do not include the dynamic aspects of health insurance coverage. This discussion of the uninsured follows that convention, but it is important to note that many people change their health insurance status over the course of a year.

Major Subgroups

People without health insurance coverage do not fit a single description—and the composition of the uninsured in terms of large subgroups of people has changed considerably since the late 1970s. The reasons for these changes are discussed in a separate section below. Before examining why people are uninsured, however, it is useful to know where the uninsured live and the characteristics that describe major subgroups of the uninsured. Using U.S. Census data from 2006, only slightly more than half are poor by official federal poverty standards, and the uninsured include a substantial number of middle-class people. Certain subgroups stand out: 20% are children, and another 40% are younger adults, 25 to 44 years old. One fifth are foreign-born, legal residents who are noncitizens. The primary reason these people are uninsured is that they lack access to employer-sponsored health insurance and most cannot afford to buy it in the individual market. The doubling of healthcare spending in the past decade has driven premiums to the point that an increasing number of companies are limiting their insurance costs and even individuals with middle-class incomes cannot afford individual coverage.

Where the Uninsured Live

As Figure 1 and Table 1 show, the uninsured are concentrated in the South and Western regions of the nation. More than half live in the South Atlantic, West South Central, and Pacific states. The regions with the highest proportions of their population who are uninsured are the West South Central (26%), Mountain (21%), South Atlantic (20%), and Pacific (19%). In contrast, New England has the lowest proportion of its population who are uninsured (11%). The fact that there is such variation in the proportion of the regions' populations who are uninsured is important

because those areas with the higher proportions of uninsured face a more difficult financial situation in their efforts to expand health insurance coverage to their residents.

The Poor and the Middle Class

It is commonly believed that everyone who has an income below the federal poverty level (\$10,294 for a single individual and \$20,614 for a family of four in 2006) is covered by Medicaid. However, Medicaid covers many of the poor but not all: 11.5 million people—a quarter of all the uninsured younger than 65 years of age—had family incomes in 2006 that were officially in poverty. Another 13.5 million people (29% of the uninsured) were near poor, with incomes between the poverty level and two times the poverty level. Together, just over half of the uninsured—25 million people—had incomes that were poor or near poor by official standards. In terms of simple chances of being uninsured, one third of the people with incomes below two times the poverty level were uninsured in 2006.

Figure 2 shows the family incomes of the uninsured in dollars rather than in comparison with the federal poverty level. Half of the uninsured have family incomes less than \$30,000. But almost 30% of the uninsured are middle-class people. The middle class can be defined as anyone with a family income above the median household income (i.e., the income level above which half the households in the nation have incomes). In 2006, the median household income was \$48,201. By this definition, 13.5 million uninsured people were middle class.

The simple probability of being uninsured for a working-age adult (23–64 years of age) has increased significantly during the past 25 years. In 2006, a third of all working-age adults with incomes below the middle-class threshold were uninsured. This fraction is again half as large as it was in 1979, when a fifth of lower-income adults were uninsured. For middle-class adults, the simple probability of being uninsured is significantly lower. However, it has increased from just 6% in 1979 and throughout the 1980s to between 10% and 11% in 2005 and 2006. The fact that 1 in 10 working-age middle-class adults is uninsured signals a significant problem with health insurance for a substantial portion of the middle class.

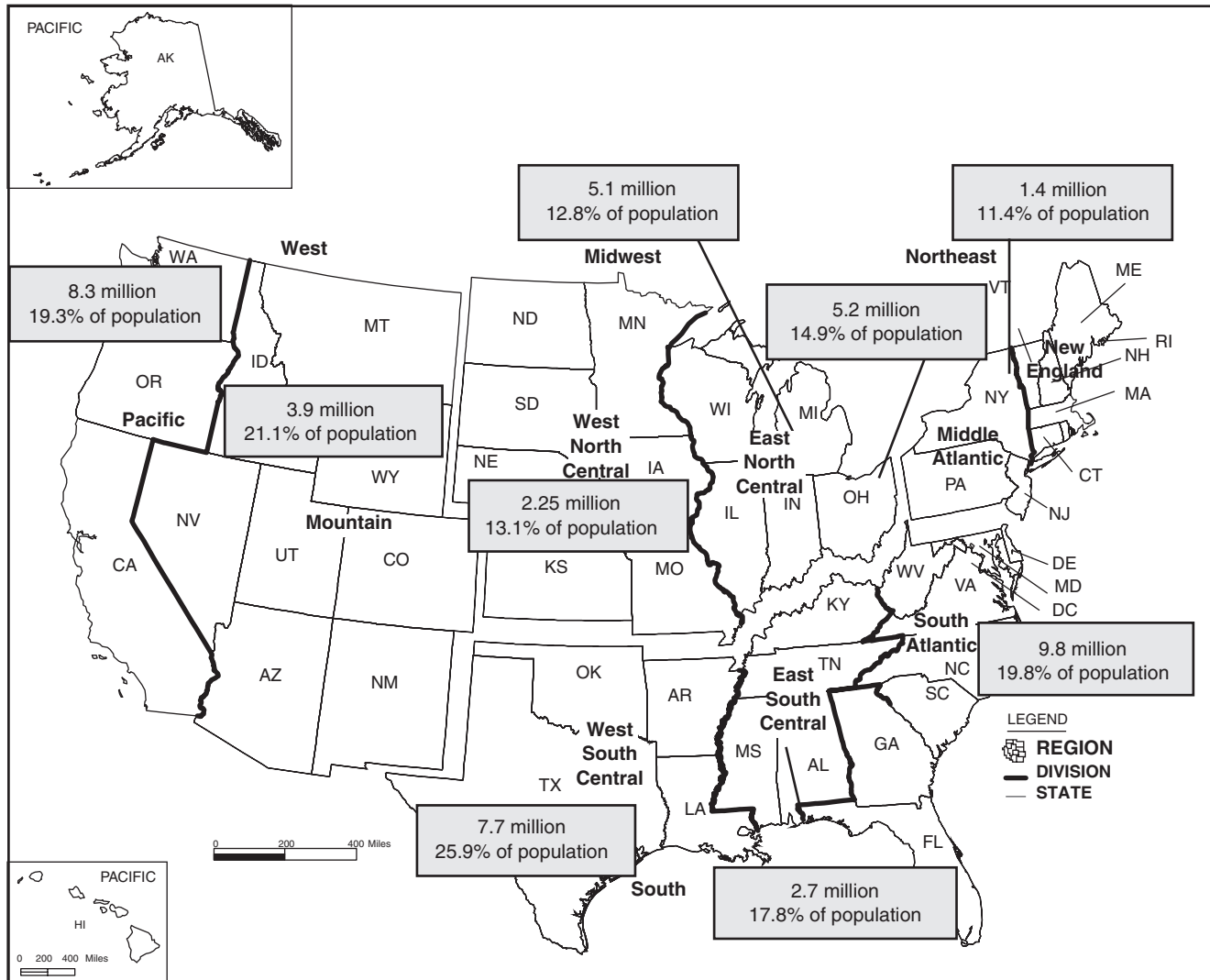


Figure 1 Numbers of Uninsured Younger Than 65 Years of Age by Regions of the United States and Percentage of Each Region's Nonelderly Population That Is Uninsured, 2006

Source: U.S. Census Bureau, Current Population Survey, March 2007.

Table 1 Regions of the United States Where the Uninsured Younger Than 65 Years of Age Live, 2006

Region	Number of Uninsured (Millions)	Percentage of Uninsured	Uninsured as Percentage of Region
New England	1.396	3.0	11.4
Middle Atlantic	5.158	11.1	14.9
East North Central	5.137	11.1	12.8
West North Central	2.253	4.9	13.1
South Atlantic	9.842	21.2	19.8
East South Central	2.711	5.8	17.8
West South Central	7.701	16.6	25.9
Mountain	3.939	8.5	21.1
Pacific	8.301	17.9	19.3
Total United States	46.438	100	17.8

Source: U.S. Census Bureau, Current Population Survey, March 2007.

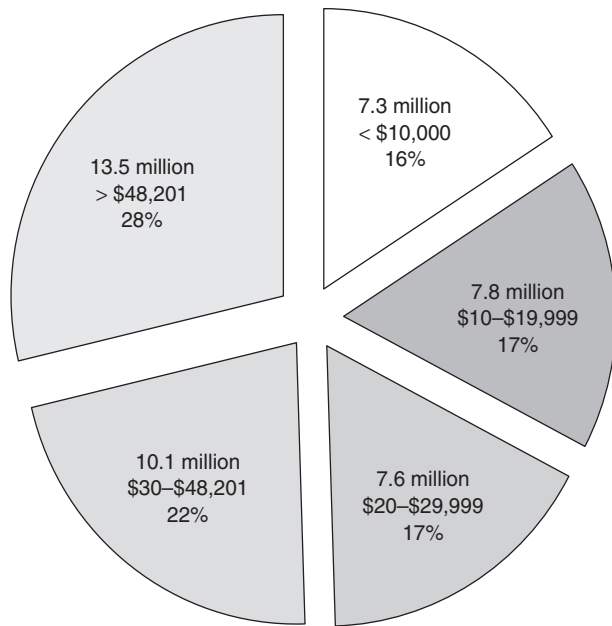


Figure 2 Family Income of the Nonelderly Uninsured, 2006

Source: U.S. Census Bureau, Current Population Survey, March 2007.

Adults 25 to 44 Years of Age and Children

As can be seen in Figure 3, two out of five uninsured in 2006 are 25 to 44 years old. More significantly, as Figure 4 shows, the percentages of all people in these age cohorts who are uninsured are at all-time highs: More than a quarter of all 25- to 34-year-olds and a fifth of all 35- to 44-year-olds were uninsured in 2006. These fractions of each cohort are twice what they were in 1979.

Twenty percent of the uninsured in 2006 were children younger than 19 years of age. This fraction of the uninsured is half what it was in 1979, when 40% of the nonelderly uninsured were children. The major explanation for the drop in the percentage of the uninsured who were children is that the Medicaid income eligibility cap for children was raised starting in the late 1980s and in 1997 the State Children’s Health Insurance Program (SCHIP) for near-poor children was implemented. In the early 2000s, the number of uninsured children stopped falling, and between

2005 and 2006, the number increased by 700,000, so that in 2006, 9.4 million children were uninsured. The fraction of all children who were uninsured was 12.1%, which was a slight increase over the past few years.

People With Less Formal Education and Occupations

Having low levels of formal education is a significant handicap for finding a job with employer-sponsored health insurance, and it is a major predictor of someone being uninsured. As Figure 5 shows, almost two thirds of uninsured adults 23 to 64 years of age have not gone past high school for formal education. Among adults who have not completed high school, 44% were uninsured; and a quarter of all adults who have high school diplomas but no further formal education were uninsured. This is a shift from a generation ago, when high school graduates could find well-paying jobs with large manufacturers. In 2006, five of the eight occupations that had the largest numbers of workers did not have high education requirements, and more than a

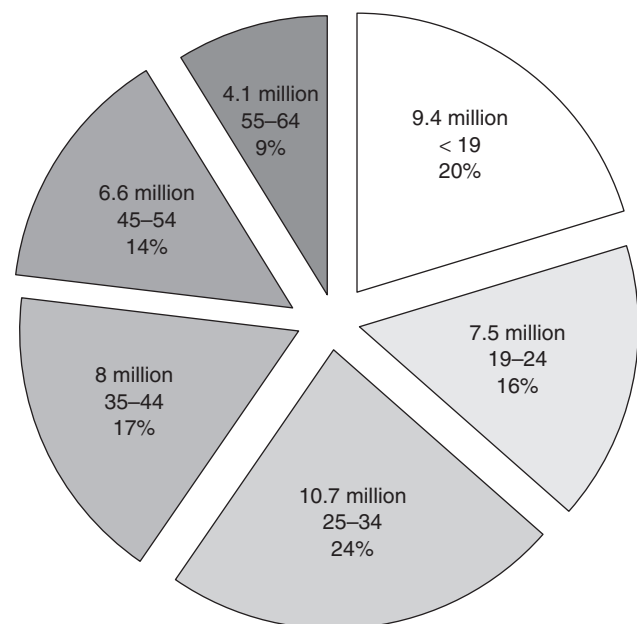


Figure 3 Age Distribution of the Nonelderly Uninsured, 2006

Source: U.S. Census Bureau, Current Population Survey, March 2007.

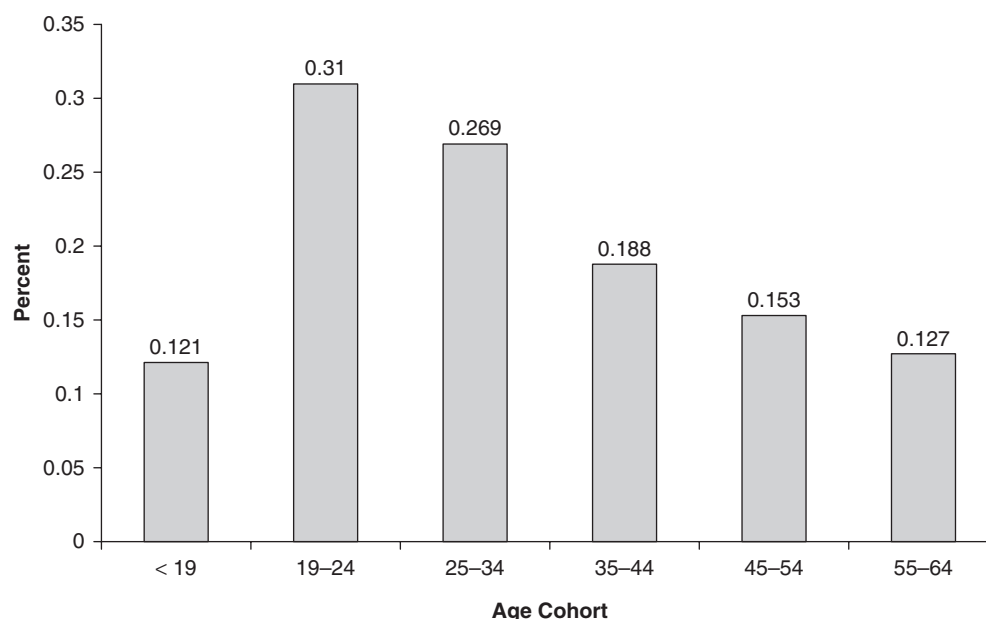


Figure 4 Fraction of People Without Health Insurance by Age Cohort, 2006

Source: U.S. Census Bureau, Current Population Survey, March 2007.

fifth of the people in each of these occupations were uninsured.

Foreign-Born Status

Immigrants who respond to U.S. Census surveys are almost all legally in the country; undocumented immigrants tend to hide from census interviewers. Immigrants are now a large subgroup of the uninsured. Just over a fifth of the uninsured in 2006—10 million people—were not born in the country and were not citizens. Another 2.3 million uninsured were foreign-born and were naturalized citizens. To see these numbers from another angle, not quite half (46.6%) of the foreign-born population who were not yet citizens were uninsured. This is in contrast to 15% of Americans born in the country and 19.8% of naturalized citizens who were uninsured.

The foreign-born who are not citizens include people who have not yet lived here long enough to apply for citizenship and people who may expect to return to their country of origin sometime in the future. Foreign-born residents who have been in the country for longer periods of time are less

likely to be uninsured than people who immigrated within the past 5 years.

A majority of foreign-born noncitizens are younger adults with low levels of formal education, earn low wages, and do not have employer-sponsored insurance at their jobs. Most of these uninsured immigrants live in the three regions of the country with the highest rates of uninsured. But even middle-class and well-educated foreign-born noncitizens are more likely to be uninsured than their native-born counterparts. Two out of five noncitizens have middle-class incomes, yet 28% of middle-class noncitizens are uninsured.

It is too simple to say that the immigrants from Latin America (which is where half the foreign-born population in 2000 came from) are uneducated and that explains the increase in the number of uninsured. Instead, the growth in the number of less educated immigrants in the past 20 years has to be seen as contributing to the imbalance between the demand for and supply of unskilled workers, enabling firms to hire low-wage workers without offering employer-sponsored health insurance.

To sum up, the 47 million people without health insurance coverage are a group of people with

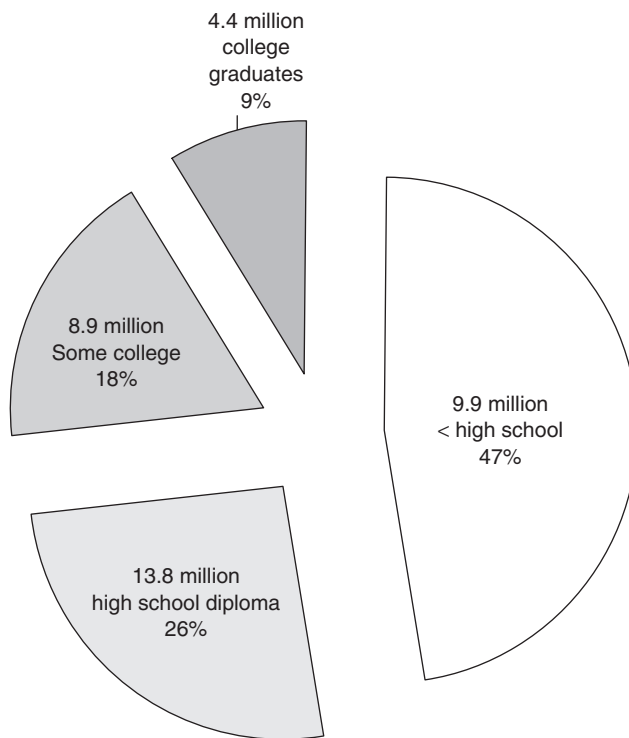


Figure 5 Education of Uninsured Adults (19–64 Years Old), 2006

Source: U.S. Census Bureau. Current Population Survey, March 2007.

many characteristics. Although it is tempting to say that many uninsured have several of the characteristics described above, that is not the case. In 2006, there were 3.1 million adults 19 through 34 years of age who had incomes below the poverty level, had not gone beyond high school for formal education, and were uninsured, but they accounted for only 17% of all uninsured adults 19 to 34 years of age. Thus, it is important to understand why an increasing fraction of the population are uninsured and why the uninsured today consist of different types of people compared with 25 years ago.

Reasons People Are Uninsured

Decline in Employer-Sponsored Health Insurance

The large increase in the number of uninsured between 2005 and 2006 reflects a now almost decade-old decline in the percentage of people with employer-sponsored insurance. In 2000, 68.3% of

the population younger than 65 years of age had employer-sponsored coverage, in 2006, the fraction was 62.9%. During the same time period, there was a steady decline in the fraction of firms that sponsored health insurance (from 69% in 2000 to 61% in 2006). In practice, the shrinking of employer-sponsored group coverage is greater than these statistics suggest. Firms that offer health insurance to “regular” employees are increasingly using workers hired through contract houses (often known as contract workers) and temporary agencies, and other self-employed people who work on specific tasks for long periods of time. When companies hire workers in these ways, the workers are not technically employees and are not included in the fringe benefit plans the firms offer. Younger adults are particularly likely to be employed as contract workers, which helps explain their significant representation among the uninsured.

The decline in the proportion of firms offering health insurance and the increased use of contract workers indicates the extent to which companies are moving to limit their financial risk of increases in healthcare costs over which they do not have direct control. For employers, the fastest rising labor cost has been health insurance. Since 1996, premiums for employer-sponsored coverage (both actual policies purchased from insurers and premium-equivalent costs for self-insured plans) have grown every year; the increases reflect the doubling of healthcare spending since 1996. Between 2001 and 2007, premiums for firms with more than three employees increased 78%—outpacing general inflation, which rose 17%. These increases occurred in spite of most employers shifting more out-of-pocket costs onto the workers in the form of higher deductibles and copayments and implementing more restrictions on pharmaceuticals and mental health benefits. In addition, although the average employee share of premiums has remained constant since 1999, there is great variation in the share of premiums paid by employees. A major survey of employer-sponsored health insurance premiums found that workers in firms with a high proportion of low-wage workers (i.e., firms where 35% or more of the workers earn less than \$21,000 a year) pay a higher share of family policy premiums than do workers in firms with lower proportions of low-wage workers. Although the rate of increase

in premiums between 2006 and 2007 (6.1%) was the smallest since 1999, it is still larger than the rate of inflation.

Employer attitudes toward the costs of employer-sponsored coverage also reflect the labor markets in which they hire workers. Most of the growth in employment over the past two decades has been in the services sector, in particular healthcare services, professional business services, and leisure-hospitality-entertainment services. Many of the companies in these industries are small and employ large numbers of low-wage, less skilled workers. Immigrant labor is particularly prevalent in these markets. As long as the supply of workers willing to work in these service jobs is much larger than the demand for them, the firms can keep wages low and not offer health insurance to attract or keep the workers. Moreover, the demand for the services provided by these industries is very price sensitive, so firms are not in a position to charge higher prices in order to provide higher wages and group health insurance coverage.

High Premiums for Individual Insurance

People who do not have access to employer-sponsored coverage have only one choice for purchasing health insurance: the individual insurance market in their state—the market in which insurers sell policies covering individuals (and their dependents) rather than policies covering groups of people. Individual insurance is far more expensive than is employer-group coverage because insurers face the risk that a disproportionate number of people who want to purchase individual policies are at higher risk of having high medical costs than the general population. This risk is known as adverse selection. As a result, premiums for family policies in individual markets typically cost more than \$700 per month and have a deductible of \$5,000 or more.

In spite of the fact that many younger adults do not have employer-sponsored coverage and are good candidates to purchase individual coverage, the growth in healthcare costs has driven up premiums and the risk of adverse selection in the individual market. Increasingly, the people who purchase individual insurance are 45 and older—ages when healthcare spending tends to increase. It

is not uncommon for those who are older or have medical conditions to face premiums in the individual market of \$12,000 or more per year or to be offered policies that do not include care related to their conditions. Those who are younger and healthy also generally face premiums that are higher relative to what they think healthcare costs are likely to be because insurers expect that adverse selection is occurring also among the younger adults. The result is that individual policies are unattractive and unaffordable to younger adults. Even younger adults who are earning middle-class incomes may decide that any “normal” medical care they might use would cost less than the premiums they would face in the individual market.

Low Income

The third major reason why many people are uninsured is that they have low income. A little more than half of the uninsured have family incomes below \$30,000, and people with incomes below \$30,000 (or below three times the federal poverty level) cannot afford insurance in the individual market. To have an income above the poverty level, a person must be working (or be a dependent of someone who is working). Thus, a majority of the low-income uninsured are employed or dependents of someone who is employed, but they do not have access to employer-sponsored coverage, and they cannot afford to purchase insurance on their own.

Future Implications

People without health insurance are at risk for a financial catastrophe and for not obtaining medical care that could save their lives and improve the quality of their lives if they have chronic medical conditions. One in six nonelderly people in the nation now faces such risks, and a fifth of them are children who do not have a choice in their insurance status. Furthermore, almost 80% of the uninsured are younger than 45 years of age. They would be relatively inexpensive to insure since the vast majority of them are healthy and use little medical care. The fact that more than a quarter of 25- to 34-year-olds and a fifth of 35- to 44-year-olds are uninsured is not good for them or the nation's private health insurance system. Insurers

need younger, healthy people among their insured to counterbalance the risks of higher medical costs of older people. For these reasons, many believe that a new strategy for reducing the number of uninsured in the United States is needed.

Katherine Swartz

See also Access to Healthcare; Adverse Selection; Coinsurance, Copays, and Deductibles; Economic Barriers to Healthcare; Healthcare Reform; Health Disparities; Health Insurance; Medicaid

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Web Sites

Agency for Healthcare Research and Quality (AHRQ): <http://www.ahrq.gov>

Commonwealth Fund: <http://www.commonwealthfund.org>
Employee Benefits Research Institute (EBRI): <http://www.ebri.org>
Henry J. Kaiser Family Foundation (KFF): <http://www.kff.org>
U.S. Census Bureau: <http://www.census.gov>

UNITED KINGDOM'S NATIONAL HEALTH SERVICE (NHS)

One of the most contentious and complex issues in health services research is defining and assessing the appropriate role of government in delivering healthcare. Great Britain has developed what is widely recognized as the most advanced system of healthcare based on management and delivery by the government through tax financing. The history and experience of the healthcare system in post–World War II Great Britain is a robust example of state control and delivery of healthcare services based on the premise of universal coverage and access. Recently, the National Health Service (NHS) in England has embarked on a program of reform and modernization that is being observed with interest by researchers concerned with questions of access, implementation of technology, health outcomes, and cost controls. The NHS comprises separate organizations in England, Scotland, Wales, and Northern Ireland, but each operates on the same principles of universal access and essentially free care, funded by national tax revenues. This entry focuses on the English NHS.

History

The NHS was created in 1948 (implementation of the NHS Act occurred in 1946), but there were a number of policy debates and developments in the preceding half-century that laid the groundwork for the comprehensive system launched following the end of World War II. In the decades preceding the war, public hospitals grew to be the major treatment centers in the United Kingdom. Although there were few public general hospitals, a diverse collection of specialty public hospitals focused on infectious diseases, mental health, and maternity

services, resulting in two thirds of patients being treated at public hospitals by the late 1930s.

Voluntary (not-for-profit) hospitals—originally charity societies—began to charge for services in the two decades before the war, which paralleled the development of health insurance, beginning with the National Health Insurance (NHI) plan created in 1911. This compulsory system provided sickness benefits to the employed working class, including primary care and drugs. By 1939, the NHI, despite excluding the unemployed, married women who did not work, and children, covered 43% of the population. Ninety percent of general-practice physicians participated in the NHI, although specialist services were not covered.

Although there were a number of studies and proposals made with regard to reforming the fragmented British healthcare system in the decade prior to the creation of the NHS, the 1942 Report to Parliament on Social Insurance and Allied Services provided the impetus for the creation of a nationalized healthcare system. Known as the Beveridge Report, after its author Lord William Beveridge, the document proposed a comprehensive social security system, including a national health service to provide tax-funded comprehensive medical care for everyone in the United Kingdom. The Beveridge report became the Labor Party's platform for a social welfare state following the war.

The NHS came into existence in 1948 as the centerpiece of the Labor Party's plan for rebuilding the British economy. There was little opposition at the time, in part because of the clear victory of the Labor Party in the 1945 parliamentary elections and a national consensus that some type of social security program was necessary for rebuilding a stable workforce following the trials of the war.

Evolving Structure

The original structure of the NHS was designed in part to overcome the objections of several important interest groups to a nationalized system of healthcare. The most significant objections came from the medical profession, particularly general practitioners, who feared the loss of their professional autonomy, restrictions on practice, and inadequate compensation. The Minister of Health, Aneurin Bevan, agreed to a number of provisions designed to overcome those objections. Many of

the objections mirrored the Labor Party's internal debate over whether to focus on providing comprehensive health services based on local authority control or whether there should be a national system of healthcare controlled by the central government. Bevan insisted on nationalization of the entire hospital sector, as one element of a tripartite system of providing healthcare services. The social element was the creation of local health authorities to provide primary and specialized services, including mental health clinics, ambulance services, and related public health and social services.

A third element was intended to overcome the objections of the most vocal critics of a national health service, the general-practice physicians. Bevan agreed that these physicians would be independent contractors, rather than salaried employees, and would provide services based on contracts negotiated with representatives of their profession, primarily the British Medical Association. The contracts would be administered by separate administrative units, called executive councils, which would include representatives of the medical profession. The principle that primary-care physicians are contractors, rather than employees, has survived to this day.

The nationalization of hospitals themselves was less contentious than other issues, largely because of the support of specialty physicians and surgeons, called consultants in the United Kingdom. Unlike general practitioners, specialists were largely supportive of the NHS even though they would practice primarily in the newly nationalized hospitals. Their professional organizations, including the Royal College of Physicians and the Royal College of Surgeons, supported the creation of the NHS after Bevan made some important concessions relating to hospital structure and operations, particularly with regard to teaching hospitals. Hospitals would be coordinated by regional hospital boards and would be operated by local hospital management committees, including representation from the medical profession. In addition, teaching hospitals, at which many of the top consultants practiced, would have separate boards of governors, again with representation from the medical profession. In addition, consultants could continue to have private practices and would benefit from generous compensation plans.

The NHS began operation in 1948 based on this tripartite model of separate structures for

hospitals, physicians, and local health services, all reporting ultimately to the national Minister of Health. This structure remained largely intact until the mid-1970s, when problems that were evident from the earliest days of the NHS reached a critical stage. Through its many changes over the past 60 years, the principle on which the NHS was founded continues to guide the system today: universal and comprehensive healthcare services based on clinical need, not on the ability to pay.

The 1974 Reorganization

At the time the NHS was created, it was assumed that there would be heavy demands on its services for the first few years of operation as patients used services that were unavailable or inaccessible prior to the creation of the nationalized system. It was suggested that the demands on the services would decrease over time as these deferred health issues were addressed. In fact, demand was heavy and did not diminish over time.

Although the NHS enjoyed great public support from its creation, it soon became apparent that there were problems with duplication and overlap of management and coordination functions within the three-part structure that were affecting the ability of the NHS to respond to demands on its operations. The NHS Act of 1974 was intended to address these concerns by reorganizing the NHS to provide a more coordinated system of regional planning and local administration of all health services. At the top level, regional health authorities were created to provide overall planning. Ninety area health authorities were created with responsibility for overall coordination of health services, and several hundred districts were created to manage the actual health services provided.

Unfortunately, it soon became clear that these additional layers of management were not resulting in more efficient utilization of resources and delivery of services. There were several other reorganizations between the mid-1970s and 2002, when the current structure of the NHS was adopted.

Current Structure

The NHS Reform and Health Care Professions Act of 2002 marked the beginning of a major modernization effort for the English NHS and its

constituent units. Twenty-eight regional strategic health authorities (SHAs), serving populations of between 1.5 and 2.4 million people were created. The number of SHAs was reduced to 10 in 2006. The SHAs report directly to the Department of Health. The SHAs are responsible for allocating budgets, strategic planning, and oversight of services within their particular region, but they do not have operating responsibilities. Reporting to each SHA is a range of agencies, called trusts, that provide the actual healthcare and ancillary services. The principal trust types are primary-care trusts (PCTs), NHS (hospital) trusts, and NHS foundation trusts. The SHAs and trusts have a similar structure. They are public corporations governed by a board, which consists of operating executives and outside nonexecutive members appointed through a Department of Health selection process. Each authority and trust is headed by a nonexecutive director, who is appointed after public advertisement and selection by the respective board.

Primary-Care Trusts (PCTs)

Most health services are provided by PCTs. Originally, there were 303, but these were consolidated into 152 PCTs in 2006. The PCTs have responsibility for outpatient services, dental services, mental health services, pharmacies, ambulance and emergency services (through contracts with separate NHS Ambulance trusts), and, through contracts with separate NHS trusts, most hospitals within their defined geographic region. More than 80% of the NHS budget is controlled by the PCTs. The PCTs are also responsible for contracting for primary-care services with general practitioners. Patients select their general practitioner from a list provided by their PCT. Other healthcare services are selected by the general practitioner in consultation with the patient, although this is changing with the Patient Choice initiative discussed below.

NHS (Hospital) Trusts

The NHS trusts operate the majority of hospitals in England. There are approximately 150 hospital trusts that operate several hundred hospitals. These geographically designated hospital trusts contract with the PCTs to provide services for

patients within a defined area. They employ physicians for hospital-based care as well as contracting for specialists (consultants). Until recently, patients were required to use a hospital within their geographic region. This will change dramatically with the full implementation of the NHS Choice Plan announced in 2005.

The possibility of competition among hospitals because of the recent NHS initiatives has focused attention on the question of quality differences within the NHS. Until the 1980s, allocation of NHS budgets to local authorities was based almost solely on the previous year's budget allocation. Since that time, there have been a number of attempts to tie budgets to medical needs within a region, but inequities continue to exist. Therefore, there is concern that with choice there will be underutilization of hospitals that are perceived as having lower quality than higher-quality hospitals (which include most of the country's university-related teaching hospitals).

A quality measurement program is being implemented that will financially reward hospitals with better clinical outcomes in the hope that such an incentive will promote quality improvements in the worst-performing hospitals. However, it is acknowledged that this may not be sufficient within the current financing structure, in which there is limited capital for investment in equipment and facilities. One solution has been the creation of NHS foundation trusts.

NHS Foundation Trusts

Beginning in 2004, hospital trusts have had the option to convert to foundation trusts, which have a unique legal status within the NHS. Foundation trust hospitals are independent legal entities, owned by their members (who are patients, staff, and any local individuals who desire to be members). A foundation trust hospital is governed by an independent board of governors elected by the membership and is licensed by an independent regulator outside the NHS and the Department of Health. Unlike other NHS hospitals, a foundation trust hospital may borrow from private-sector financial sources, retain surpluses and proceeds from the sale of assets, contract with NHS entities and private providers for services, and provide pay and benefits different from the NHS schedules.

The most significant change is that the foundation trust hospitals may charge for treatment of private pay patients. The private health insurance market covers almost 15% of the healthcare expenditures in England, and foundation trust hospitals, like private hospitals, are permitted to treat privately insured patients. There is a cap on the percentage of income permitted to be derived from private pay patients. Essentially, the hospitals are required to maintain the level of NHS services provided at the time of conversion to foundation trust status.

The foundation trust program started in 2004 with 10 hospitals. In 2007, more than 70 hospitals had converted to foundation trusts. The government's plan is to have all NHS hospitals convert to foundation trust status within a decade. The government's expectation is that with greater access to private capital, greater operational autonomy, and accountability to its staff and patients, hospitals will be able to overcome the limitation on resources that has plagued them since the creation of the NHS. In addition, the government is no longer financially and operationally responsible for the hospitals that are foundation trusts.

Financing the NHS

Since its inception, the NHS has been funded through a combination of general taxation and a separate national insurance tax contribution from employers and employees. The national insurance funds a range of social benefits, including the NHS and the pension system. In 2007, more than 80% of the NHS budget comes from general taxation and about 12% from the national insurance funds. The balance of revenues comes from fees (less than 3%) and debt instruments. In recent years, the NHS has accounted for about 85% of healthcare expenditures in the United Kingdom. A growing private insurance sector has fostered the growth of private physician practices and private healthcare facilities.

In 2006, government expenditures for the NHS approached \$200 billion. The per capita expenditure on healthcare in 2004 was about \$2,500, about average for the 30 nations that are members of the Organization for Economic Cooperation and Development (OECD) and substantially less than the \$6,100 per capita for the United States. For the same year, healthcare spending in the United

Kingdom was 8.1% of the gross domestic product (GDP), while it was 15.3% in the United States. The median among OECD members was 8.8%.

One of the criticisms of the NHS's financing system is that there is little transparency since taxpayers do not readily know what percentage of their taxes actually goes to the NHS. In addition, each PCT has broad authority to use its devolved budget as it determines, with the principal government control being that the PCTs are not permitted to incur deficits.

The Modernization Initiative

Reacting to criticisms about perceived declining service and lack of investment in the NHS, Prime Minister Tony Blair commissioned a reform program for the NHS that was announced in 2000 ("The NHS Plan"). The plan called for a number of measures to modernize the NHS and improve its services. Central to the implementation of the plan was a promise made in 2002 to increase the expenditures on the NHS from 7.7% of GDP to 9.4% by 2008. Three of the most important initiatives relate to patient waiting times, modernization of information technology, and providing patients with greater control over their healthcare through choice of providers.

Patient Waiting Times

By 1997 the waiting time for treatment after diagnosis was as long as 18 months because of the lack of personnel, equipment, and facilities. One result of this was increased patient dissatisfaction with the NHS. A 1999 poll found that 42% of the British public were fairly or very dissatisfied with the NHS. The long patient waiting times became a primary political issue in successive parliamentary elections. The Blair administration made waiting times the most critical improvement promised in the NHS Plan. The wait time for treatment fell to a maximum of 9 months by 2004, with the government's goal being 18 weeks, from the first appointment with a general practitioner through treatment by 2008. Although it appears that such an ambitious goal may not be met, there has been decreased public attention directed at the NHS waiting times in recent years as they have noticeably decreased.

Modernization of Information Technology

The most ambitious element of the NHS Plan was to increase substantially its investment in information technology, with the goal of creating the most modern infrastructure in healthcare. The Blair administration proposed a national program estimated to cost more than \$32 billion over 10 years for electronic medical records, electronic imaging archives, and patient appointment and management systems, along with the necessary infrastructure improvements. By 2007, the actual expenditures were more than \$20 billion, but none of the major initiatives had been fully implemented. Technical issues and cost overruns have delayed the program, which is the largest information technology program ever attempted in the country. However, it appears likely that the effort to implement electronic medical records across the NHS will be completed by 2012.

Patient Choice

A major element of the NHS Plan is to increase patient options for treatment. Called Patient Choice, this program has become the major visible change in the NHS over the past 5 years. In addition to the creation of the NHS foundation trust program, the government's plan is to allow patients to choose among several treatment facilities within the country, whether or not part of the NHS. If the facility meets NHS quality and performance standards and the charges do not exceed the maximum price that the NHS pays for such treatments, a patient may choose care at an independent treatment center for specified procedures. To date, approved procedures include many outpatient surgical procedures. In some cases, foundation trusts have entered into contracts with privately operated outpatient treatment centers to provide such services. Several non-British companies, including at least one U.S. healthcare provider, have opened treatment centers in England. Patients can now choose any NHS foundation trust hospital for treatment; in addition to the approved private-sector treatment centers, there are at least four local NHS hospitals that have contracts with the patient's PCT. Before Patient Choice, a patient was assigned to the closest local hospital that provided the prescribed treatment.

To assist patients with making choices, the Department of Health requires the collection of patient outcome data on specified medical conditions, which are published. Patients may use this information to select their treatment center or hospital.

Future Implications

The NHS is one of the most cherished of British institutions. The NHS Plan recognizes that a number of problems need to be addressed if public support and confidence are to be maintained. Foremost among these is the pressing need for modern facilities and improved access to medical technologies. Although the NHS has technologies available that rival those of any health system in the world, the dispersal of those technologies varies depending on the region and other factors that are not based on medical need.

In addition, many parts of the country depend on hospitals with outdated facilities. Although capital investment has tripled in the past 5 years, there is a need for substantial upgrading of facilities in many parts of the country. This is an area in which the NHS's efforts to develop public/private partnerships will likely be most visible. Rather than assuming the entire burden of building new facilities, it is probable that the successful experience with private independent treatment centers will provide the impetus for more ambitious partnerships to develop healthcare facilities.

Finally, there is general recognition both inside the NHS and within the government that the NHS has not developed a culture that encourages innovation in operations. Although a network of NHS innovation centers has been created to help promote the development of innovative approaches to healthcare delivery, critics have suggested that there has been little evidence of an impact to date.

Frank S. Phillips

See also Access to Healthcare; Comparing Health Systems; Healthcare Reform; Health Services Research in the United Kingdom; International Health Systems; National Health Insurance; Rationing Healthcare; United Kingdom's National Institute for Health and Clinical Excellence (NICE)

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Web Sites

- National Health Service (NHS): <http://www.nhs.uk>
National Institute for Health and Clinical Excellence (NICE): <http://www.nice.org.uk>

UNITED KINGDOM'S NATIONAL INSTITUTE FOR HEALTH AND CLINICAL EXCELLENCE (NICE)

Within the United Kingdom's National Health Service (NHS), the National Institute for Health and Clinical Excellence (NICE) is the agency charged with the task of developing and disseminating clinical, public health, and healthcare technology guidelines to be followed by all NHS providers and provider organizations. Its objective is to develop ways to standardize treatment

approaches at the highest levels among NHS providers in order to try to ensure uniformly good-quality healthcare.

Background

NICE came into being on April 1, 1999, as part of an initiative designed to eliminate perceived historical inequities in access to the best in healthcare. The present agency is an outgrowth of the National Institute for Clinical Excellence (also known as NICE), with an expanded role and mission. In April 2005, another NHS agency, the Health Development Agency, was folded into NICE, expanding the latter agency's scope to include public health. NICE's jurisdiction extends to all NHS providers. Providers that do not belong to the NHS generally meet the standards and guidelines as well, although they are not required to do so.

Organizational Structure

A 15-member board governs NICE. The board's standing committees are the Audit Committee, the Citizen's Council Committee, and the Remuneration and Terms of Service Committee. In addition, NICE calls on the expertise of the NHS and the broad healthcare community to assist in its work. It relies on several independent advisory committees, including those on interventional procedures, public health interventions, research and development, and technology appraisal.

Role

National standards ("frameworks") that essentially define access to and eligibility for specified types of care and services are formulated by the National Service Frameworks (NSFs) body. Typically, the NSFs set up one new framework per year. While frameworks have some resemblance to clinical pathways, they are less detailed. In their annual process called the annual health check, the healthcare commissions serve as the system regulators. The commissions evaluate the system's performance against the core standards that apply to existing performance and the developmental standards that reflect the capacity to

improve. The role of NICE is to develop the working guidelines (guidances) that will be followed by the NHS provider organizations in complying with the frameworks. Currently, NICE's guidance on health technologies and clinical practice only applies to England and Wales, while its guidance on the safety and efficacy of interventional procedures applies to England, Wales, and Scotland. NICE's guidance on public health practices applies to England alone.

In evaluating technology and technological approaches, NICE works with a wide variety of consultative and advisory bodies, including several independent academic centers representing universities and other academic groups. In developing clinical guidelines, the royal medical and nursing colleges, professional bodies, and provider organizations work with NICE. When more information is needed before guidance can be developed on an interventional procedure, NICE convenes an advisory committee composed of experts in the aspect of care being studied. This development process is funded by the NHS Department of Health, which commissions NICE to develop guidelines applying to clinical practice, public health, and healthcare technology.

NICE guidelines reflect and embody the principles of evidence-based medicine as well as cost-effectiveness. Guidelines on a particular subject are developed in response to needs as perceived and articulated by the public, the healthcare community, and professional and technology-oriented organizations and proposed by them to NICE for action. NHS providers to whom a NICE guideline, or guidance, applies are then expected to follow this guideline in their practice, taking it fully into account when deciding what treatments to give people. The healthcare commissions survey and evaluate provider performance with reference to the guidance.

In one sense, the NICE guidances show a superficial resemblance to the advisories published by the U.S. Agency for Healthcare Research and Quality (AHRQ), although NICE publishes specific implementation templates to support its guidances, listing the steps in the implementation process.

When NICE issues a guidance covering a treatment measure addressed in a core standard, the budget provisions needed by the NHS member organization to support practitioner and provider

compliance with that guidance must be in place within 3 months. In the case of a guidance reflecting a developmental standard, provider organizations are allowed more than 3 months for implementation.

Jean Gayton Carroll

See also Clinical Practice Guidelines; Cost-Benefit and Cost-Effectiveness Analyses; International Health Systems; Outcomes Movement; Quality of Healthcare; Rationing Healthcare; Technology Assessment; United Kingdom's National Health Service (NHS)

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United Kingdom's National Institute for Health and Clinical Excellence (NICE): <http://www.nice.org.uk>

UNIVERSITY HEALTHSYSTEM CONSORTIUM (UHC)

Established in 1984, the University HealthSystem Consortium (UHC) is a nonprofit alliance of more than 100 academic medical centers and 170 of their affiliated hospitals, representing approximately 90% of the nation's nonprofit academic

medical centers. Based in Oak Brook, Illinois, the consortium offers its members specific programs and services to improve clinical, operational, financial, and patient safety performance.

Mission and Vision

The mission of the UHC is to advance knowledge, foster collaboration, and promote change in order to help members succeed in their respective markets. Its vision is to be a catalyst for change, accelerating the achievement of clinical and operational excellence.

Products and Services

The UHC's various products and services provide support and resources for effective and efficient management of clinical, operational, and financial performance of an academic health system's enterprise through comparative data analytics, implementation assistance, educational and developmental resources, and networking and collaboration opportunities. Easy-to-use online reports and other Web-based tools blend clinical, operational, administrative, and financial data, enabling UHC members to benchmark and compare their performance with that of their peers and act on opportunities to improve. Product examples include the Funds Flow Collaborative, a database and reporting system of the economic interdependencies of academic medical centers, schools of medicine, and faculty practice plans; the UHC Patient Safety Net, an online data collection tool for reporting, tracking, and trending of adverse medical events; the Faculty Practice Solution Center, a database used to examine clinical productivity, plan physician incentive compensation, perform workforce analysis, and promote revenue cycle improvement; and the Managed Care Contracting Compass, an interactive database and packaged pricing model that compares various managed care contracts on a regional or national basis. Additionally, the consortium provides a variety of other services and products in areas including quality and risk, technology assessment, business strategy and tactics, and value analysis.

The UHC's supply chain optimization program is another exclusive, integrated offering of services designed to help its members make the best possible

decisions when addressing their organizations' supply chains. Novation, LLC, is the group purchasing organization for consortium's participants.

Membership

There are two categories of UHC membership: member and related organizations. For the membership category, an applicant for membership in the consortium must be a nonfederal teaching hospital or health system that has a documented affiliation agreement with a medical school by the Liaison Committee on Medical Education and fulfils one of the following conditions: (a) it is under common ownership with a medical school; (b) the majority of the medical school department chairs serve as the hospital's chiefs of service, or the chairman is responsible for appointing the hospital chief of service; or (c) it has a reputation for excellence in service, teaching, and research as determined at the discretion of the UHC Member Board of Directors, or its designee, based on consideration of clinical support of undergraduate medical education and an employed clinical faculty with a centralized practice plan.

System membership has two or more clinical entities that serve the same medical school and independently meet the criteria for full membership. Each category contains several classes of participation, with the following designations: (a) associate—an acute-care hospital that is sponsored by a consortium member or organizational member; (b) organization—an affiliated organization invited by the consortium's Governing Board to join the UHC (e.g., National Association of Public Hospitals); (3) international—a non-U.S. alliance of teaching hospitals (like the UHC) or a teaching hospital that meets the above membership criteria; (4) faculty practice plan—a faculty group practice organization associated with a medical school and organized with a unified corporate governance structure, which provides identifiable and functionally integrated practice management services and is accountable for the clinical, financial, and operational performance of its member physicians.

In addition, full UHC members and associate members may sponsor entities that provide health-care services (other than an acute-care hospital) as an affiliate or an alternate shipping location. Other consortium member-sponsored providers, including

faculty practice plans, ambulatory clinics, medical schools, universities, and others can access the power of group purchasing through the consortium's affiliate purchasing program.

Implications for Health Services Research

The UHC's major contribution to health services research is its provision of data to researchers from member organizations. Data from the consortium enable researchers to compare clinical practice patterns and the outcomes of care at academic medical centers across the nation. Because of such a large number of medical centers and the large number of patients they treat, data from the consortium can be used to study critical and emerging issues of clinical and strategic importance. Data from the consortium have been used to study the outcomes of bariatric, colon, and other surgeries; various pharmaceutical and disease state evaluations; intensivist physician staffing patterns; and outcomes of various medical education programs, including nurse residency programs.

Karl Matuszewski

See also Academic Medical Centers; Benchmarking; Hospitals; Patient Safety; Quality of Healthcare; Safety Net; Technology Assessment

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Web Sites

University HealthSystem Consortium (UHC):
<http://www.uhc.edu>

URBAN INSTITUTE

The Urban Institute is a nonprofit, nonpartisan policy research and educational organization established in Washington, D.C., in 1968. Its multidisciplinary staff investigates the social, economic, and governance problems confronting the nation, evaluates the public and private means to alleviate them, and helps other countries build local government capacity, improve public service delivery, and nurture civil society.

Through work that ranges from broad conceptual studies to administrative and technical assistance, Institute researchers contribute to the knowledge available to guide decision making in the public interest and strive to deepen citizens’ understanding of the issues and trade-offs policy-makers face.

The Institute’s genesis came in the mid-1960s, when many U.S. cities were in turmoil and tatters. President Lyndon B. Johnson, seeing the need for independent, unbiased analysis of the problems facing urban America, created a blue-ribbon

commission of civic leaders who recommended chartering a center to do that work. The Urban Institute became that center.

Today, the Urban Institute is home to 10 policy centers and more than 230 economists, demographers, statisticians, sociologists, political scientists, educators, and other researchers and analysts. Its Health Policy Center, inaugurated in 1977 and now one of the Institute’s largest research centers, uses rigorous methods to bring objective evidence to the panoply of health service concerns, including community-based care, disabilities, health insurance, hospital and physician payments, long-term care, Medicaid, Medicare, the State Children’s Health Insurance Program (SCHIP), and uninsured and uncompensated care. Center scholars also address cost containment, managed care, liability and tort reform, the financing and delivery of health services, and their quality and appropriateness, among other issues.

Much of the Health Policy Center’s work is on who gets needed health coverage, who doesn’t, what the ramifications are of not having health insurance, and what can be done to secure access to care. A review of a quarter-century of studies found strong evidence that the uninsured receive fewer preventive and diagnostic services, tend to be more severely ill when diagnosed, and receive less therapeutic care, resulting in poorer health outcomes and higher mortality rates. Research on why 46 million people lack health insurance found that nearly all of them believe that they need coverage but more than half say that they can’t afford it. Perceptions about cost matter, the study determined, whether the uninsured individual is old or young, healthy or disabled, with high income or income well below the poverty level.

Another analysis determined that the number of nonelderly people without health insurance climbed by 1.3 million between 2004 and 2005, bringing this group’s uninsurance rate to nearly 18%. Eighty-five percent of this increase was among those with family incomes below 200% of the federal poverty level. The analysis showed that job-based insurance is dropping because of significant increases in premium costs; job shifts away from medium and large firms and those in the manufacturing, finance, and government sectors, employment environments that traditionally have high rates of employer-based insurance coverage; and

population movement toward the South and the West, regions with lower rates of employer-based health insurance coverage.

At the 10th anniversary of the SCHIP in 2007, the Institute estimated that the program had signed up close to 70% of its target population, but 1.8 million eligible children nationwide were yet to be enrolled. Federal funding for SCHIP, which was enacted in 1997 to expand health coverage to low-income uninsured children who do not qualify for Medicaid, will have to increase substantially, the study noted, if these children are to join the approximately 3.9 million children with SCHIP coverage.

Health Policy Center researchers also analyze local and regional healthcare circumstances and services, glean data, lessons, and insights that are often useful across the country. Legislation enacted in Massachusetts in 2006 aimed at bringing near-universal healthcare coverage to the state. The bipartisan legislation drew partly on the center's extensive analysis and practical policy recommendations on costs and mechanisms for covering the state's 530,000 uninsured residents. As healthcare costs soar nationwide and more businesses trim employee coverage, Institute staff are working with other states to define their range of policy options.

New York State's medical providers cared for 2.5 million uninsured individuals in 2005, a Health Policy Center research team found. Federal, state, and local governments transferred billions of dollars to hospitals and other providers in a number of complex ways, of which \$3.5 billion was deemed to relate to uninsured care. After Hurricane Katrina devastated the Gulf Coast, a Health Policy Center white paper examined what happened in New Orleans's hospitals, especially the 11 flood-bound institutions in the most desperate circumstances, why experiences varied for the hospitals and their patients, and how to avoid the most serious shortcomings in planning by hospital and public authorities.

The U.S. Congress, executive branch agencies, and state officials often call on the Urban Institute researchers to present their research or testify on legislative matters. At a U.S. House subcommittee hearing, for instance, legislators were told that developing meaningful universal health insurance coverage within a private insurance system requires

four elements: (1) comprehensive subsidized insurance benefits for low- and modest-income individuals, (2) a guaranteed source of coverage for all potential purchasers, (3) a mechanism for spreading across a broad population the costs of covering those with the greatest need for healthcare services, and (4) either a mandate for individuals to obtain coverage or that mandate combined with a "light" employer mandate.

Health policy researchers frequently call on the expertise of other Institute centers. The Transfer Income Model (TRIM), maintained and developed by the Income and Benefits Policy Center under primary funding from the U.S. Department of Health and Human Services (HHS), can illuminate the effects of changes in Medicaid, SCHIP, or employer-sponsored health insurance as well as assess participation rates and cross-program interactions. With the nation spending more than \$250 billion annually on tax incentives for workers to buy health insurance, the Urban-Brookings Tax Policy Center investigates how income tax deductions, vouchers, and similar mechanisms can meet healthcare challenges.

Health policy has been a cornerstone of the Institute's biggest research project ever. Started in 1996, *Assessing the New Federalism* monitored and analyzed the well-being of American children and families as states assumed major responsibility for healthcare, income security, social services, and job-training programs for low-income Americans. Caseloads dropped precipitously after 1996's landmark welfare overhaul, but the Institute research revealed that 1 year later, 49% of mothers who had left the rolls and 29% of their children had no health insurance.

Looking ahead, the Institute's projects will report on the condition of and changes in the healthcare delivery system throughout the United States; estimate the risk, timing, and amount of lifetime disability and long-term care, including both nursing home care and care at home; model health insurance costs and the impact of reinsurance, with technical assistance to states considering health reforms with a reinsurance component; and look at the path from the Food Stamp and school meal programs and family food behavior to child obesity.

Stuart Kantor

See also Access to Healthcare; Cost of Healthcare; Health Insurance Coverage; Medicaid; Medicare; Public Policy; State-Based Health Coverage Initiatives; Uninsured Individuals; State Children's Health Insurance Program (SCHIP)

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Web Sites

Urban Institute: <http://www.urban.org>
 Urban Institute's Health Policy Center:
<http://www.urban.org/center/hpc>

U.S. DEPARTMENT OF VETERANS AFFAIRS (VA)

The U.S. Department of Veterans Affairs (VA) operates the nation's largest integrated healthcare system providing services and benefits to veterans, active-duty military personnel, and their dependents through a nationwide network of 155 hospitals, 881 outpatient clinics, 135 nursing homes, 46 residential rehabilitation treatment programs, 207 readjustment counseling centers, 57 veterans benefits regional offices, and 125 national cemeteries. In 2006, it provided care to nearly 5 million unique patients and 54 million outpatient visits.

Established in 1930 as the Veterans Administration, it was elevated to U.S. Cabinet-level status in 1989, becoming the U.S. Department of Veterans Affairs. Today, the VA is the second largest Cabinet department, employing more than 235,000 individuals. It is composed of a Central Office (VACO), which is located in Washington, D.C., and field facilities throughout the nation administered by its three line organizations: (1) Veterans Health Administration (VHA), which provides healthcare services; (2) Veterans Benefits Administration (VBA), which determines eligibility-level and benefits; and (3) the National Cemetery Administration (NCA), which provides burial services for veterans.

The VA plays a major role in improving the public's health as well as conducting clinical research. Additionally, it is the nation's largest provider of healthcare education and training for medical residents and other trainees and is one of the 10 largest research and development agencies in the federal government. In FY2006, the VA's appropriated budget was \$73.6 billion.

History

The early tradition of caring for our nation's veterans can be traced back to colonial times. For more than 140 years, care for the country's veterans was provided by a patchwork of various federal agencies. In 1930, however, the U.S. Congress authorized the President to consolidate all government activities that affected war veterans, combining the Veterans Bureau, the Bureau of Pensions of the Department of Interior, and the National Home for Disabled Volunteer Soldiers within the new Veterans

Administration. After World War II, a large number of veterans needing medical care inundated the VA's rudimentary healthcare capabilities. As a result, in 1946, the U.S. Congress formally authorized a healthcare system for veterans, creating the VA Department of Medicine and Surgery.

Additionally, the VA was given the responsibility of administering the GI Bill, which was passed in 1944. The GI Bill provided education and training for all veterans. Since its passage, more than 21 million veterans, service members, and their dependents have received nearly \$27 billion in benefits. In 1973, the VA also assumed the primary responsibility for the National Cemetery System from the Department of the Army. As a result of its increasing responsibility and importance, in 1989, the VA was elevated to an executive-level department with membership in the President's Cabinet.

Today, the VA provides a comprehensive and coordinated system of assistance for all the nation's veterans and their families. It operates national programs providing healthcare, financial assistance, and burial benefits, as well as supporting a large research program. Approximately 63 million individuals are potentially eligible to receive VA benefits and services because they are veterans, dependents, or survivors of veterans.

Medical Care

Because all veterans are potentially eligible for care at the VA, providing access to healthcare and other benefits has long been a challenge. To meet the healthcare needs of America's veterans, the VHA provides a broad range of primary-care, specialized-care, and related medical and social support services. The VHA healthcare facilities provide a broad spectrum of medical-surgical and rehabilitative care. Beginning with a system of 54 hospitals in 1930, the VHA has expanded to 155 medical centers—with at least one medical center in each state, Puerto Rico, and the District of Columbia. It also operates ambulatory care and community-based outpatient clinics, nursing homes, residential rehabilitation treatment programs, veterans centers, and comprehensive home care programs.

To ensure that veterans continue to receive needed medical care in the future, the U.S. Veterans Administration runs the largest medical education and health professions training program in the

nation. More than one half of the physicians practicing in the United States had some of their professional education in the VHA healthcare system. VHA facilities are affiliated with 107 medical schools, 55 dental schools, and more than 1,200 other schools across the country.

Costs

The annual spending of the VA in FY2005 was \$71.2 billion. A total of \$31.5 billion was allocated for healthcare, with the largest portion of the budget used for benefit payments. In FY2006, the budget was increased by \$1.8 billion for additions in healthcare and disability compensation.

The President's proposed budget for FY2008 seeks funding for an expansion of the services provided to veterans, including \$36.6 billion for medical care, \$1.3 billion for more prosthetics and sensory aids, \$3 billion for needed mental healthcare, and \$750 million for the construction of medical facilities. Much of the rapidly increasing budget costs of funding the VA are attributable to national increases in healthcare costs.

Quality

The quality of healthcare given by the VHA has been examined very closely. Recent studies conducted by Harvard Medical School concluded that federal hospitals, including those operated by the VHA, provided superior care for some of the most common medical conditions, including heart attack, heart failure, and pneumonia. The researchers found that patients who were treated in federal facilities were more likely to receive high-quality care than those in for-profit hospitals. Another study conducted by the RAND Corporation found that the VHA outperformed all other sectors of healthcare in the United States across a spectrum of 294 measures of quality in disease prevention and treatment.

Research

The U.S. Veterans Administration is one of the 10 largest research and development agencies in the federal government. Specifically, it has the eighth largest research and development portfolio in the FY2008 budget. The entire research and development budget

is allocated to a nationwide network of VHA hospitals and Centers of Excellence (COE).

The VHA advances medical research and development in ways that support veterans' needs by pursuing research in areas that most directly address the diseases and conditions that affect veterans, including combat-related trauma. The knowledge gained from research conducted at the VHA contributes to the public good through improving the understanding of diseases and disabilities. The advances in technologies from research at the VHA, intended primarily for veterans, also lead to gains in medical education, patient care, and public health. Some notable research conducted at the VHA includes construction of the first artificial kidney, development of the cardiac pacemaker, the first successful liver transplant, and development of prosthetic devices such as hydraulic knees and the robotic arm.

The major areas of research and development at the VHA include biomedical laboratory science, clinical science, rehabilitation research, and health services research. The biomedical laboratory science is the largest budgeted area of research, and it focuses on aging, chronic disease, and environmental exposures. Clinical science research funds clinical trials and other medical research using the large patient population in VHA medical facilities. Rehabilitation research focuses on improving the quality of life of veterans with disabilities, such as developing improved prosthetics. Health services research focuses on improving the effectiveness and efficiency of healthcare services and translating research into clinical practice. The objectives of health services research at the VHA include improving clinical decision making and care, informing VHA policy making, evaluating changes in the healthcare system, measuring health outcomes, and informing patients and the public interested in healthcare research.

One of the most significant transformations in the research portfolio at the VHA is the development of the COE, established by the VHA Health Services Research and Development (HSR&D), which provides for 15 centers across the country. Each center, which is affiliated with a VHA medical center, develops its own research agenda and collaborates with local universities and schools of public health to fulfill its mission. The research at each center serves to energize the facility and network with which it is affiliated and is designed to provide a constant source of innovation.

Women Veterans' Healthcare

Of the nation's 27 million veterans, about 6% are women, with the number expected to rise to 10% by 2010. And women constitute the fastest growing segment of eligible VHA healthcare users. Women veterans have their own unique healthcare needs, and the VHA seeks to make sure that they receive the best available care to meet those needs. Research studies conducted or funded by the VHA are mandated to include women veterans as a way of ensuring that their specific health needs are taken into consideration. In the past decade, there has been an expansion of biomedical, clinical, health services and rehabilitation research with the goal of improving the health status of women veterans. Recent initiatives through the VHA Women's Health Research and Development (ORD) commenced a VHA Women's Health Research Planning Group to develop a comprehensive research agenda for women veterans and to position the VHA as a national leader in women's health research.

Organizational Transformation

With the rapid changes in the nation's healthcare system and the aging of the nation's population, the U.S. Department of Veterans Affairs found itself in need of change. In 1995, the VA underwent a significant organizational transformation. The overarching goals of the reorganization were to optimize the value of VHA healthcare and to ensure the consistent and predictable provision of high-quality care throughout its system.

Among the major changes that took place were that the VHA went from a centralized system to a decentralized national network of facilities and 21 Veterans Integrated Service Networks (VISN) were established. These decentralized regional networks of care were created to better focus the needs of veterans in a specific region of the country. Under this new system, each network of providers and facilities assumes responsibility for the health of a specific population of eligible veterans.

Another significant change was the move to increase access to care through ambulatory settings. During this period of restructuring, 28,886 (55%) of inpatient acute-care beds closed, while the outpatient capacity increased with the opening of 302 community-based outpatient clinics.

A shift in the management style also occurred during the VA's organizational transformation with the creation of a performance management program that emphasized quality improvement and quality innovation. Managers were held contractually accountable to achieving predefined targets within a specified time frame. In addition, several best practices were implemented to improve clinical care.

Another major innovation at the VA was the implementation of a systemwide electronic health record called the Veterans Health Information Systems and Technology Architecture (VISTA). The VISTA system is designed to network the health records at all the VHA's inpatient and outpatient healthcare facilities nationwide. Because of VISTA, a wealth of information is available to conduct clinical and health services research studies on the VHA. The VHA also implemented the Quality Enhancement Research Initiative (QUERI), a systemized quality innovation program that links the aspects of clinical care, teaching, research, and the continuous measurement of outcomes to ultimately improve patient care.

Current and Future Direction

The VA has extraordinary responsibilities to meet the healthcare needs of veterans and their families and undertakes research to improve healthcare services. The VA, by necessity, meets new standards of care, the rising drug costs, technological innovations, and labor concerns. Through its radical reengineering and transformation, the VA has become a pioneer in coordinating and systematizing healthcare. Today, the VA continues its legacy of caring for our nation's veterans, conducting research that improves their healthcare, and providing vital education and training to medical professionals. The VA will continue its mandate of serving veterans and their families in the future.

Robert C. Good

See also Cost of Healthcare; Health Services Research at the Veterans Health Administration (VHA); Multihospital Healthcare Systems; Nursing Homes; Public Policy; Quality Enhancement Research Initiative (QUERI) of the Veterans Health Administration (VHA); Quality of Healthcare

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U.S. FOOD AND DRUG ADMINISTRATION (FDA)

The U.S. Food and Drug Administration (FDA) is an agency of the Department of Health and Human Services (HHS) with massive and broad-ranging

consumer protection responsibilities. The mission of the FDA is to protect the public's health through the provision of information and regulation (including the manufacturing, importing, transporting, and sale) of human and veterinary drug products, biological products, medical devices, food products (other than traditional meat, poultry, and egg products, which are regulated by the U.S. Department of Agriculture), cosmetics, and radiation-emitting electronic products. The average American consumer spends more than 20 cents of every dollar in the purchase of FDA-regulated products, which total more than \$1 trillion in annual sales. The FDA's far-reaching authority and global influence rank it as among the most influential regulatory agencies in the world. Yet the FDA faces critical challenges in meeting its mission because of leadership transitions and lack of funding.

History

The evolution of the FDA has been described as a series of crisis-legislation-adaptation cycles. A consistent pattern marks historical milestones in societal and governmental responses that affected the FDA: crisis mode following public outcry from a well-publicized public health tragedy, passage of congressional legislation in response to public pressures, and adaptation by the FDA or its predecessors to implement new laws.

Prior to the 20th century, states and local governments were the primary regulatory authorities for foods and drugs, and there were loose oversight and many problems pertaining to the adulteration (contamination) and misbranding (mislabeling) of foods and drugs. The U.S. Congress passed a small number of individual laws pertaining to specific foodstuffs sold in interstate commerce, but these laws were of very limited scope. Early federal legislative efforts that influenced the later establishment of the FDA included the following: the Vaccine Act of 1813, which was enacted to prevent fraudulent marketing of smallpox vaccine and provided for the preservation of a reference standard of smallpox vaccine against which other purported vaccines could be compared (the act was repealed in 1822, after an outbreak of smallpox thought to be related to a contaminated lot supplied for the reference standard and the belief that vaccine regulation should be locally based rather

than federally based); the Drug Importation Act of 1848, which prohibited the importation of adulterated drugs following suspected mortality of U.S. soldiers from contaminated quinine and other drugs imported during the U.S.-Mexican War; and the Biologics Control Act of 1902, which required licensing of establishments that produced and marketed vaccines and antitoxins, following the deaths of almost two dozen children who were inoculated with a diphtheria antitoxin that was later found to be contaminated with tetanus bacillus.

A series of events, based on actuality and hyperbole, revealed disturbing problems of food adulteration in the 1800s and early 1900s, when advances in chemistry enabled increased detection of contamination. The origins of the FDA date back to President Lincoln's appointment of Charles M. Wetherill (as a one-man staff) in the Division of Chemistry of the U.S. Department of Agriculture in 1862. His appointment began the scientific foundations for activities now under the jurisdiction of the FDA, although commensurate regulatory authority was not established for decades to come. Later, Harvey W. Wiley was appointed Chief Chemist from 1883 until 1912 for the Division, which became the Bureau of Chemistry in 1901. In 1927, the Bureau changed its name to the Food, Drug, and Insecticide Administration, and in 1930, it shortened it to the Food and Drug Administration (FDA).

With political acumen, a knack for sensationalizing events and garnering media attention, the ability to form alliances, and an unwavering tenacity, Wiley spearheaded efforts to revolutionize the power of his office. His initiatives included the highly publicized 1902 Poison Squad, which consisted of noncontrolled experiments to assess the effects of chemical preservatives on healthy volunteers and other tactics. Wiley's efforts coincided with accounts of fraudulent and toxic medicines in many magazines, and the publication of Upton Sinclair's novel *The Jungle*, a horrifying and outrageous exposé on the nation's meatpacking industry. This provided the impetus for enactment of the 1906 Pure Food and Drugs Act (nicknamed the Wiley Act). The Pure Food and Drugs Act prohibited the interstate transport of misbranded and contaminated foods, drinks, and drugs; required labeling of a select list of ingredients (if included) and their amounts in patent medicines; and prohibited false

and misleading advertising of the ingredients (but not therapeutic claims) of patent medicines on product labeling. Loopholes in the act included the exclusion of advertising materials as part of product labeling and enforcement difficulties due to lack of funding and onerous legal requirements to prove adulteration and misbranding.

Several bills were introduced in the U.S. Congress in an attempt to remedy the shortcomings of the 1906 Pure Food and Drugs Act, but there was no change until another public health crisis occurred. In 1937, in an attempt to improve the flavor, the S. E. Massengill Company of Bristol, Tennessee, added the solvent diethylene glycol to lots of the antibiotic Elixir Sulfanilamide. Given the toxic properties of the solvent (similar to antifreeze), 107 individuals (mostly children) died as the result of ingesting the formulation before the problem was contained. Public uproar prompted congressional passage of the 1938 Food, Drug, and Cosmetic Act. This act provided for the following: requirement of scientific testing to establish drug safety (with the burden imposed on the product manufacturers) prior to marketing; regulation of cosmetics and devices used for therapeutic purposes; authorization of the FDA to inspect manufacturing facilities; virtual prohibition of poisonous additives in foods; authorization to stop false drug claims; and expanded legal options that the FDA could pursue, including product seizures, criminal prosecutions, and federal court injunctions. The 1938 act and its amendments underpin the FDA's current regulatory authority, including amendments regarding pesticides (Miller Pesticide Amendment of 1954), additives (1958 Food Additives Amendment and the Color Additive Amendment of 1960), and drugs. Of note, the 1951 Durham-Humphrey Amendment to the 1938 act specified the FDA classification of prescription drugs (or legend drugs) and nonprescription or over-the-counter drugs; previously, drugs could be purchased much like any other commodity. Attempted legislative efforts that called for the FDA to establish drug product safety and efficacy were unproductive until the thalidomide tragedies.

Thalidomide was marketed in Germany as a sedative and antinausea medicine from 1957 until 1961, during which time it was found to cause thousands of congenital birth defects and malformations, disabilities, and deaths of babies whose

mothers took the drug during pregnancy. While the United States experienced only 17 confirmed birth defects from thalidomide, the incident helped bring about the enactment of the Kefauver-Harris Drug Amendments to the 1938 act. The 1962 Kefauver-Harris Drug Amendments mandated demonstration of drug product safety and substantial evidence of efficacy (including review of drug products approved between 1938 and 1962 solely on the basis of safety), FDA authority over well-controlled drug trials, regulation of prescription drug advertising, and establishment of good manufacturing practices. The Medical Device Amendments of the 1938 act were enacted in 1976, based on the findings of more than 10,000 injuries and 731 deaths from faulty devices, such as contraceptive intrauterine devices.

Another legislative milestone was the 1984 Drug Price Competition and Patent Term Restoration Act (also known as the Waxman-Hatch Act), which enabled the FDA to accept abbreviated new-drug applications (ANDAs) for generic drug products and increased the effective patent term of drug products, which had been eroded by the length of the drug approval process. More federal laws were passed pertaining to foods, drugs, devices, or cosmetics over the past 25 years, including the 1990 Nutrition Labeling and Education Act, which required uniform labeling information of nutritional content and allowed for validated scientific health claims, and the 1994 Dietary Supplement Health and Education Act (DSHEA), which greatly restricted the FDA's jurisdiction in regulating dietary supplements (e.g., orally administered vitamins, minerals, herbs, amino acids, metabolites, and other substances) unless the agency found them to be unsafe after marketing them.

One of the more controversial statutes affecting the FDA in recent years was the 1992 Prescription Drug User Fee Act (PDUFA) and its subsequent amendments in 1997 (PDUFA II), 2002 (PDUFA III), and 2007 (PDUFA IV), as well as the 2002 Medical Device User Fee and Modernization Act and its subsequent amendment. The PDUFA legislation established user fees for human drug and biologic products on submission of an application and fees on an annual basis. The additional funding from user fees was designed to enable the hiring of additional FDA staff, which would shorten review times for product approval. Enactment of

the PDUFA provisions, however, was met with controversy (accusations of conflict of interest between the FDA and its regulated industries that paid the user fees), increased FDA staff reviewer workloads, compromised staff morale and increased staff turnover, and unresolved questions about increased withdrawal rates of marketed drug products under the tighter product approval times.

Organization and Staffing

The FDA was transferred to different cabinet-level departments throughout the 20th century (from the U.S. Department of Agriculture to the former Federal Security Agency in 1940, which became the U.S. Department of Health, Education, and Welfare [DHEW] in 1953; FDA was reorganized as part of the U.S. Public Health Service [USPHS] within the DHEW in 1968). DHEW was renamed the Department of Health and Human Services (HHS) in 1980, and the FDA remains based in that department.

Under the leadership of the FDA commissioner, the agency has a staff of more than 9,000 employees with about two thirds in the Washington, D.C., area headquarters (i.e., Rockville, Maryland, with an anticipated consolidation of FDA facilities located at a Silver Spring, Maryland, site by 2009). FDA's headquarter staff focus on product review, regulatory policy, and consumer information. The other third of FDA staff are located in field offices and laboratories across the nation, and their responsibilities are concentrated more on inspections, surveillance, and education. Globally, the FDA works with foreign governments to help ensure the safety and quality of imported products.

The FDA employs staff in the physical sciences, medicine, public health, and many other areas. Its professional staff includes physicians, biologists, chemists, veterinarians, animal scientists, toxicologists, pharmacologists, biomedical engineers, nurses, pharmacists, epidemiologists, statisticians, communications experts, business people, consumer safety officers, and public affairs specialists.

Major FDA Centers

The FDA is organized into the Office of the Commissioner (leadership, management, and operations), the Office of Chief Counsel (litigators

and counselors), the Office of Regulatory Affairs (Food, Drug, and Cosmetic Act compliance, and field agent activities), and five major centers, described below. Some regulated products are referred to as "combination products" (e.g., a combination of drugs and devices, or a biologic and a device). Assignment of combination products to one of the centers may first require referral from staff in the Office of Combination Products.

Center for Drug Evaluation and Research

The FDA's Center for Drug Evaluation and Research (CDER) reviews, approves, and monitors the safety and efficacy of prescription and nonprescription drug products that are marketed in the United States. More than 10,000 drug products are currently being marketed in the nation. The FDA assumes enormous responsibility in the paradoxical duty of benefit-to-risk judgments regarding timely approval of drug products (especially for serious or life-threatening conditions where no therapeutic options are available) and continued market availability when serious problems are noted.

The drug development and approval process in the United States involves a series of rigorous steps that can take from 11 to 12 years (FDA estimate) to 15 years (industry estimate) to go from initial laboratory testing to product approval. These processes start with preclinical testing of biological activity and safety evaluations for the compound (laboratory tests, animal studies, and computer models). After promising preclinical testing, the sponsor can file an application (i.e., Investigational New Drug Application, or IND) to begin three phases of clinical testing in people (with greater numbers of subjects in each subsequent stage). If the data demonstrate safety and effectiveness, a New Drug Application, or NDA, can be submitted to the FDA for review and possible approval of the product for commercial availability as a new molecular entity. However, very few compounds—estimated to be as few as 1 out of 10,000—make it through the process from preclinical testing to final market approval at costs to the sponsors of hundreds of millions of dollars. Regulatory agencies may also call for postmarketing surveillance and additional studies after drug product approval to evaluate the long-term effects.

Generic drug applications undergo an ANDA process. For approval, the generic product must contain the same active ingredient as the innovator product; be identical in strength, dosage form, and route of administration; list the same indications for treatment; and demonstrate bioequivalence. The median ANDA approval is about 16.6 months.

Center for Biologics Evaluation and Research

The FDA's Center for Biologics Evaluation and Research (CBER) regulates biological products such as blood and blood products, vaccines, allergenic products, and protein-derived bioengineered drug products (e.g., monoclonal antibodies, cytokines, and enzymes). The biotechnology pharmaceutical industry has a product approval process similar to other research-intensive pharmaceutical products, including discovery; preclinical studies; IND and Phase I (safety), Phase II (safety and efficacy), and Phase III (large controlled studies on safety and efficacy) clinical trials; NDA and FDA review; drug product approval; and postapproval monitoring. The approval time for a biopharmaceutical ranges between 7 and 12 years from development to approval. The center also regulates human gene therapies, xenotransplantation of organs from animals to humans, cellular and tissue transplants (including stem cell therapy) and other products derived from living organisms.

Center for Devices and Radiological Health

The FDA's Center for Devices and Radiological Health (CDRH) regulates new medical devices and provides for postmarketing surveillance. A few examples of medical devices include tongue depressors, thermometers, contact lenses, glucose level monitors, blood pressure monitors, surgical robotic-arm tools, laboratory tests, and technologically complex devices such as pacemakers, heart defibrillators, and dialysis machines. The center classifies medical devices based on proposed risk and intended use. Class I medical devices (e.g., examination gloves, bandages) represent the least risk, Class II devices (e.g., X-ray machines, electronic wheelchairs) intermediate risk, and Class III devices (e.g., heart valves, breast implants) the highest risk. With some exceptions, premarket approval is generally required for Class III medical

devices. In the majority of cases where premarket approval is not required, medical devices are regulated subject to premarket notification requirements from Section 510(k) of the Food, Drug, and Cosmetic Act. The U.S. Government Accountability Office (GAO) is currently reviewing whether there is a need for revising the 510(k) process in consideration of the possible need for more evaluation of clinical safety.

Additionally, the center establishes performance safety standards for radiation-emitting electronic products such as microwave ovens, television sets, cellular telephones, X-ray equipment and systems (including airport-scanning equipment), laser products, medical imaging techniques, sunlamps, and other products. It also provides accreditation of mammography facilities.

Center for Food Safety and Applied Nutrition

The FDA's Center for Food Safety and Applied Nutrition (CFSAN) regulates the safety and labeling of foods (except meats, poultry, and egg products) and bottled water. The center strives to ensure that food products are uncontaminated, approves food additives, and regulates the contents of medical foods and infant formulas. Within the limits of the 1994 DSHEA, the center is responsible for regulating the safety of dietary supplements. It also monitors the safety and labeling of cosmetics, which do not require premarket approval (with the exception of color additives). The agency cannot require safety testing of cosmetics. The FDA is authorized, however, to pursue enforcement actions when product violations are found regarding the adulteration and misbranding of cosmetics.

Center for Veterinary Medicine

The FDA's Center for Veterinary Medicine (CVM) regulates the safety of animal food products and the improvement of the health and productivity of food-producing animals. Drugs administered to livestock must meet safety standards for the animals and humans who may eat such animal products. Specifically, the center regulates pet food production, feeds for livestock, and the approval and marketing of drug products (prescription and over the counter) used to treat animals. It also regulates the safety, effectiveness, and labeling of veterinary

devices, which do not require preapproval before marketing, unlike human medical devices.

National Center for Toxicological Research

The FDA's National Center for Toxicological Research (NCTR) conducts scientific research and provides technical expertise on mechanisms of toxicities, human exposure, susceptibility and risk involving chemicals and pharmaceuticals, food contamination, and biomarkers for chemical and biological terrorism.

Information Provision

Much information from the FDA is provided on its Web pages, which receive more than 1 million hits per day. The FDA publishes numerous consumer resources (e.g., magazines, brochures, fact sheets, and other materials) providing product and health information. It also administers two drug information centers, one in the CDER and the other in the CBER, to provide FDA-approved prescribing information on products and regulatory guidance. Inquiries come from a range of diverse constituents, including patients, consumers, health professionals, trade associations, insurance companies, regulated industries and other sponsors, advertising agencies, attorneys, investment companies, academia, law enforcement, government agencies, and the media. Information is provided by FDA staff on clinical information, adverse events, clinical investigations and trials, electronic regulatory application submissions, review processes, regulations pertaining to imports and exports, patents and exclusivity, product recalls and shortages, and product identification.

Challenges

The FDA faces a number of major challenges, including leadership, funding, and improving the nation's drug safety system. Each is discussed below.

Leadership

The FDA commissioner is appointed by the President of the United States on confirmation by

the U.S. Senate. A major challenge to the agency is the lack of stable leadership, highlighted by the fact that no commissioner has served longer than 2 years since 1997. And the position of commissioner has been vacant for many months at various times.

Funding

With small increases in congressional appropriations, the FDA budget has increasingly become dependent on user fees. Its FY2009 budget requested almost \$2.4 billion, representing about \$1.77 billion in appropriations and \$628 million generated from industry-provided user fees. Many researchers and policy analysts believe that the FDA budget is inadequate given its comprehensive regulatory authority and that more public funding is needed. While user fees increased the funding available for drugs and biologics reviews under the PDUFA mechanisms, programs that were not supported by the PDUFA fees (including drug, food, and medical device initiatives) lost about 1,000 FDA staff members since 1992 as the result of diminished funding.

Drug Safety System

In a 2007 report, the National Academy of Sciences, Institute of Medicine (IOM) summarized some of the FDA challenges and needed improvements in the nation's drug safety system. In addition to recommendations for increased funding, the report identified organizational problems in the FDA culture that contribute to the inadequate integration of premarket and postmarket safety review data; technical limitations in the ability of the current passive postmarketing surveillance system to detect signals and analyze safety systems adequately; and unclear regulatory authority over manufacturers postapproval. The report recommended more joint authority for postapproval regulatory actions within the FDA; systematic approaches in benefit-risk judgments; and the establishment of private-public partnerships and collaborative efforts among federal agencies, pharmaceutical and biotechnology companies, and managed-care organizations to consolidate stakeholder data that can support postapproval drug safety monitoring.

Stephanie Y. Crawford

See also Direct-to-Consumer Advertising (DTCA); Pharmaceutical Industry; Pharmacoeconomics; Pharmacy; Prescription and Generic Drugs; Public Health; Randomized Controlled Trials (RCT); Regulation

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U.S. GOVERNMENT ACCOUNTABILITY OFFICE (GAO)

The U.S. Government Accountability Office (GAO) is an independent, nonpartisan agency that works

for the U.S. Congress. Often called the "congressional watchdog," the GAO investigates how the federal government spends taxpayer dollars. GAO's mission is to support the U.S. Congress in meeting its constitutional responsibilities and to help improve the performance and ensure the accountability of the federal government. This includes performance and accountability related to federal health programs and spending in areas including public health, Medicare and Medicaid, defense healthcare, veterans health, long-term care, disaster preparedness, and pandemic health issues.

The GAO advises the U.S. Congress and the heads of executive agencies about ways to make government more efficient, effective, ethical, equitable, and responsive. The GAO's work is done at the request of congressional committees or subcommittees or is mandated by public laws or committee reports. The agency also undertakes research under the authority of the head of the GAO, the Comptroller General of the United States. The President appoints the Comptroller General to a 15-year term from a slate of candidates the U.S. Congress proposes. The Comptroller General cannot be reappointed and has a mandatory retirement age of 70. However, the President cannot remove the Comptroller General; only the U.S. Congress can through impeachment or joint resolution for specific reasons. GAO's main headquarters is located in Washington, D.C., and it maintains 11 field offices in various cities throughout the nation. It employs more than 3,100 individuals and has an annual budget of approximately \$490 million.

History

The GAO has focused on governmental accountability from the time it began operations. Signed into law by President Warren G. Harding in 1921, the GAO was created by the Budget and Accounting Act (Pub. L. 67–13, 42 Stat. 20), which was aimed at improving federal financial management after World War I. The statute transferred to GAO the auditing, accounting, and claims functions previously carried out by the Department of the Treasury; made GAO independent of the executive branch; and gave it a broad mandate to investigate how federal funds are spent. While the agency always has worked for good government, its mission and organization have changed over

time to keep up with congressional and national needs. In July 2004, the agency changed its official name from the U.S. General Accounting Office to the U.S. General Accountability Office. The name change better reflects the agency's modern organizational purpose while retaining its well-recognized acronym—GAO.

Health Research

The GAO supports congressional oversight of federal healthcare programs by reporting on how well programs and policies are meeting their objectives; performing policy analyses and outlining options for congressional consideration; auditing agency operations to determine whether federal funds are being spent efficiently and effectively; investigating allegations of illegal and improper activities; and issuing legal decisions and opinions, such as bid protest rulings and reports on agency rules.

Much of the GAO's work on federal healthcare programs relates to the agency's Strategic Goal No. 1: to provide timely, quality service to the U.S. Congress and the federal government to address current and emerging challenges to the well-being and financial security of the American people. For example, in FY2007, the GAO provided information that helped highlight ways to address problems affecting the delivery of health and disability services for injured soldiers and veterans, improve the U.S. Food and Drug Administration's (FDA's) process for removing dangerous drugs from the marketplace, and identify inefficient physician practice patterns to improve performance of the Medicare program.

The agency's best-known products include reports, testimonies, correspondence, and legal decisions and opinions, which are all available to the press and the public from GAO's Web site. The GAO also produces special publications to assist the U.S. Congress and executive branch agencies by recommending corrections to problems in government programs and operations, identifying long-term trends, and raising concerns about the nation's fiscal status. Among its recent special reports is *21st Century Challenges: Reexamining the Base of the Federal Government*. This report is intended to help the U.S. Congress in reviewing and reconsidering the base of federal spending and tax programs, including healthcare-related spending.

The GAO's work also seeks to analyze and monitor changes in the long-term fiscal outlook, including the effects of demographics and health-care costs, as well as other federal fiscal commitments. As the baby boomer generation (those individuals born between 1946 and 1964 who make up about 75 million individuals) retires, federal spending on retirement and health programs—Social Security, Medicare, and Medicaid—will grow dramatically. A long-term model of the federal budget and the economy, maintained by the GAO, simulates the effect of such changes. This model was adapted from work done at the Federal Reserve Bank of New York. For over a decade, the GAO has published the results of its long-term budget simulations in reports, testimonies, and other products. The model's results dramatically illustrate the need for action sooner rather than later to address the long-term fiscal imbalance.

Medicare Payment Advisory Commission

The Comptroller General of the United States and head of the GAO is responsible for appointing individuals to serve as members of the Medicare Payment Advisory Commission (MedPAC). The commission, which was established by the Balanced Budget Act of 1997, is an independent congressional agency that advised the U.S. Congress on issues affecting the Medicare program. The commission consists of 17 members who serve 3-year terms (subject to renewal). Its commissioners include actuaries, lawyers, physicians, and policy experts.

Mary F. Giffin

See also Congressional Budget Office (CBO); Cost of Healthcare; Fraud and Abuse; Medicaid; Medicare; Medicare Payment Advisory Commission (MedPAC); Public Policy; Regulation

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U.S. House of Representatives: <http://www.house.gov>

U.S. Senate: <http://www.senate.gov>

U.S. NATIONAL HEALTH EXPENDITURES

Published yearly by the National Health Statistics Group of the Office of the Actuary at the Centers for Medicare and Medicaid Services (CMS), the U.S. National Health Accounts (NHA) is the definitive source on the nation's past, current, and future healthcare expenditures. The NHA describes the total national amount spent on healthcare by type of services (e.g., hospital care, physician services, and prescription drugs), source of funds (e.g., private health insurance, Medicare, Medicaid, and out-of-pocket costs), and type of sponsors (e.g., businesses, households, and governments). Finally, the NHA presents trends in healthcare expenditures, and it makes various projections and estimates of the future healthcare expenditures.

Historical Trends

Using data from the NHA, Figure 1 shows the annual national health expenditures, the nation's

gross domestic product (GDP), and the percentage of the GDP spent on healthcare for the period 1960 through 2005. During the period, the percentage of the nation's GDP spent on healthcare increased dramatically. In 1960, healthcare accounted for 5.2% of the nation's GDP, but by 2006 it had grown to 16.0%. In 1960, total healthcare spending was \$27.6 billion, or \$143 per person, but by 2006, total healthcare spending had increased to \$2.1 trillion, or \$7,026 per person.

Types of Services Delivered

Hospitals accounted for the largest share of the nation's health expenditures. In 2006, they accounted for 30.8% of the total spending, down from a peak of 40.6% in 1982. Physician and clinical services accounted for 21.3% of the total spending in 2006, with a peak of 22.4% in 1991. Prescription drug spending reached a peak of 10.1% in 2006 from a low of 4.5% in 1982. Nursing home care accounted for 5.9% of the total spending in 2006, down from a peak of 7.3% in 1978.

Sources of Funds

The distribution of health expenditures by source of funds during the period 1960 through 2005 is shown in Figure 2. In 2006, private payers paid 54% of the nation's total health expenditures compared with 46% paid for by public payers (i.e., federal, state, and local governments). In the period 1960 through 1965, before the federal Medicare and the federal/state Medicaid programs started, private payers paid for 75% of the nation's total health expenditures. Since then, the private share has gradually declined to 54% in 2006. The actual private share may be lower because the calculation does not include the tax subsidy for private health insurance and healthcare spending. The subsidy takes the form of business and individuals deducting health insurance and healthcare spending from their taxable incomes.

The decline of the private share of expenditures was primarily due to the falling share of out-of-pocket spending. The share of out-of-pocket spending declined from nearly half the total healthcare expenditures in 1960 to 12% in 2006. While out-of-pocket spending fell, private

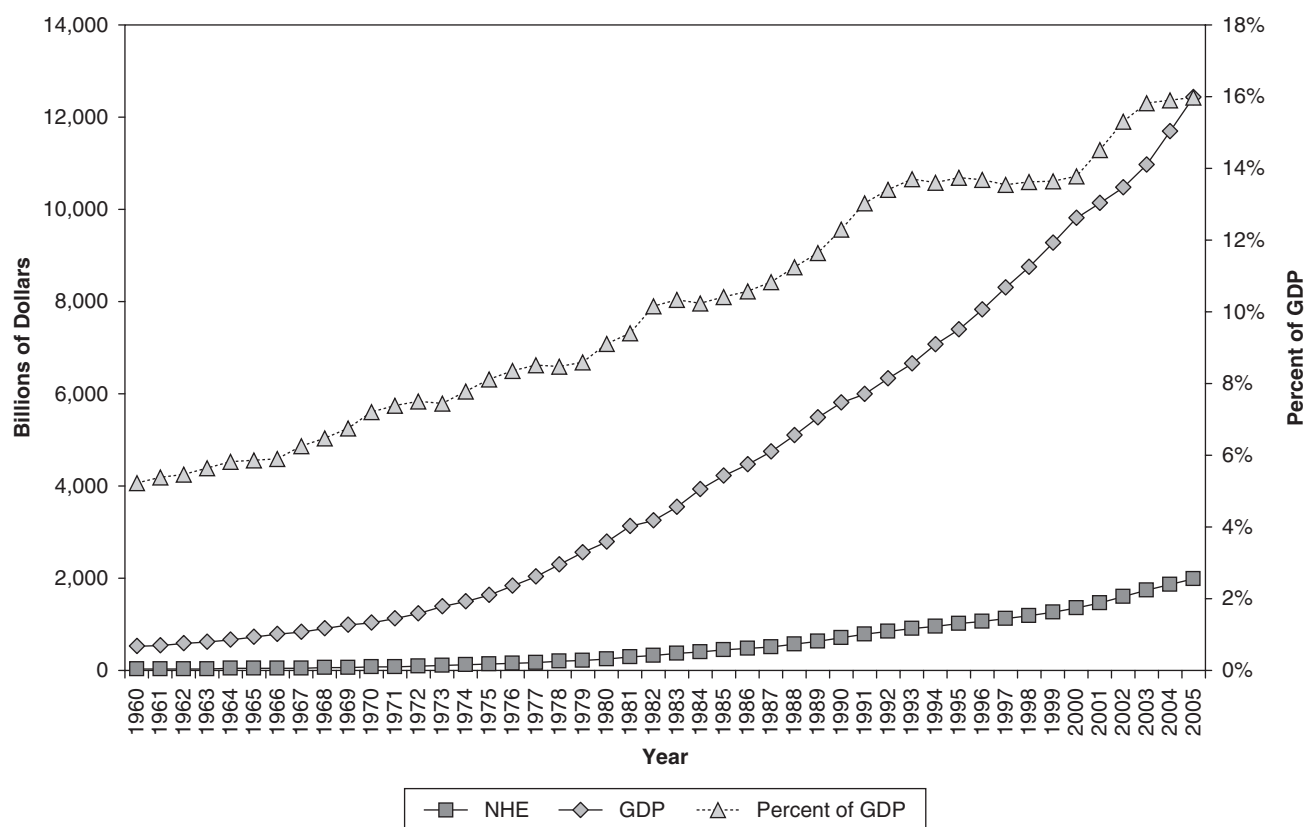


Figure 1 U.S. National Health Expenditure Figures, 1960 to 2005

Source: Centers for Medicare and Medicaid Services, National Health Expenditure Accounts.

health insurance expenditures as a share of total healthcare expenditures grew steadily over the decades.

The public share of healthcare expenditures, which includes Medicare, Medicaid, and the State Children's Health Insurance Program (SCHIP), has grown over the decades. In 2006, the public share totaled \$725 billion, accounting for 34% of the nation's healthcare expenditures.

Type of Sponsors

Categorizing healthcare expenditures by source of funds—such as private health insurance, Medicare, Medicaid, and so forth—does not identify the true payers of healthcare costs. In the late 1980s, the NHA started presenting data to identify the underlying entity financing the

healthcare bill—households, businesses, and governments. This structure allows a better understanding of who pays the healthcare bills and what burdens these costs are placing on each sponsor.

Individual households pay healthcare costs in various ways, including private health insurance premiums, payroll taxes such as the Medicare tax, and out-of-pocket costs. Private businesses pay for employer-sponsored health insurance premiums and part of employees' Medicare tax. The federal government pays for healthcare through federal employee health insurance premiums; Medicare taxes; and the Medicare, Medicaid, and other programs. Likewise, state and local governments pay similar taxes and premiums, and state governments pay their portion of the Medicaid program. In 2006, the total amount paid by private sponsors

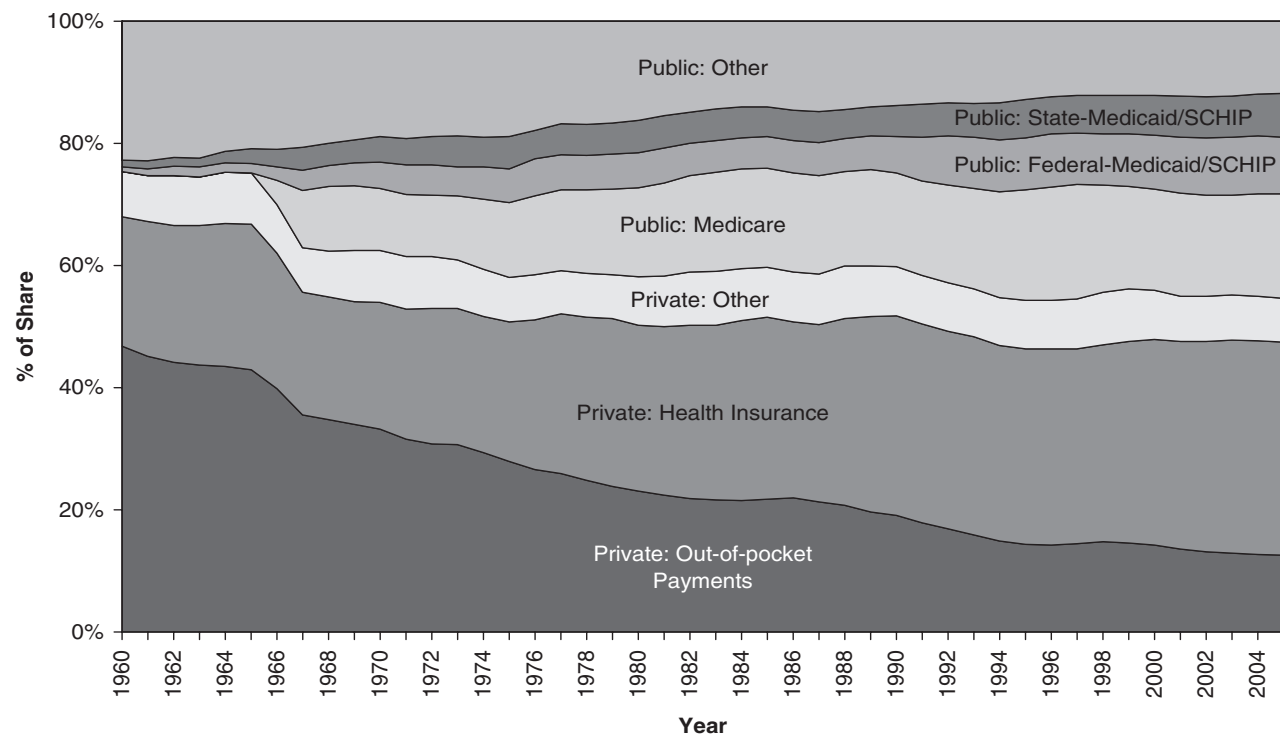


Figure 2 National Healthcare Expenditure by Source of Funding, 1960–2005

Source: U.S. National Health Accounts, 2007.

accounted for 60% of health services and supplies spending, compared with 40% by the combined federal, state, and local governments.

As implied by the spending categorized by sponsor, Medicare is not financed solely by the federal government but by all sponsors—households, businesses, and governments. For example, in 2006, households paid 36% of Medicare spending. The combined households and businesses paid 56% of Medicare spending, and the remaining 44% was paid mostly by the federal government (38%). Unlike Medicare, the Medicaid program does not have its own dedicated tax as a funding source. In 2006, using general revenue funds, the federal government's contribution accounted for 56% of total Medicaid spending, with the remaining 44% being paid for by the states.

Employers have faced rapid increases in healthcare costs. Between 1987 and 1993, the growth rate of health insurance premiums, the largest component of business healthcare costs, averaged 11% per year. Beginning in 1998, the growth in employer-sponsored healthcare premiums accelerated, largely

because managed-care plans tried to cover benefit-cost increases and boost profit margins by increasing premiums.

The Burden of Healthcare Costs

The burden of healthcare costs faced by sponsors can be more adequately measured by comparing healthcare costs relative to income revenues. The share of federal revenues funding healthcare has almost doubled, from 17.3% in 2000 to 32.5% in 2004. In 2005, the burden decreased slightly to 30.0% as overall federal spending decelerated from 9.8% to 7.1%.

For state and local governments, healthcare spending as a percentage of revenues rose from 14% in 1987, to 22% in 2000, to almost 25% in 2005. Much of the increase was driven by increases in Medicaid expenditures.

For households, the share of spending compared with personal income increased from 4.9% in 1987, to 5.3% in 2000, to 6.0% in 2005. This increase appears to be mainly due to increases in

insurance premiums and out-of-pocket healthcare spending. It should be noted that there are important disparities among households in overall spending on healthcare as a share of income. The poor and the elderly tend to spend a larger share of their income on healthcare.

Projected Healthcare Expenditures

National Health Expenditures

According to the latest NHA projections for the time period 2007 through 2017, national health expenditures are expected to average a growth rate of 6.7% per year. In 2017, the projected total healthcare expenditures will be about \$4.3 trillion and will constitute 19.5% of the nation's GDP.

Public-Private Share

It is expected that the public-private share of national healthcare expenditures will be significantly altered in the future by the Medicare Part D prescription drug program. The program, which was implemented in 2006, lessens the burden that households face in paying for prescription drugs. Employers and state governments may also benefit from the program. Employers may not have to pay the costs of prescription drugs for their retired employees. States can reduce their contributions for prescription drugs for Medicaid recipients. These changes will shift more costs to the federal government. These additional costs may hurt the long-term sustainability of the entire Medicare program.

The growth in public personal healthcare spending is projected to greatly increase, while the growth of private personal healthcare is expected to slow. Specifically, public personal healthcare spending is projected to grow at an average of 7.2% per year compared with 6.5% for private personal care spending during the period 2007 through 2017. The acceleration in public spending will largely be driven by faster growth in Medicare enrollment as the baby boomer generation becomes eligible for coverage. Also, overall out-of-pocket spending growth is expected to slow, flattening out below 10.9% by 2017.

Medicare

The annual reports of the Medicare Board of Trustees to the U.S. Congress represent the federal government's official evaluation of the financial status of the Medicare program. According to the 2007 report, Medicare expenditures are expected to increase at a faster rate than workers' income. As a result, the Hospital Insurance Trust Fund used to pay for Medicare Part A services (i.e., hospital, home health, skilled-nursing facility, and hospice care) will not be adequately financed. Taxes paid into the fund are projected to fall short of expenditures in future years. Between 2007 and 2016, the trust fund's assets are projected to decrease from \$305 billion to \$221 billion. Because this amount is less than the recommended minimum level of 1 year's expenditures, both the 2006 and 2007 reports issued a "Medicare funding warning."

The second Medicare fund, Supplementary Medical Insurance (SMI), pays for Medicare Part B and D services. Medicare Part B pays for physician, outpatient hospital, and home healthcare, as well as other services. Medicare Part D pays for prescription drugs. Medicare Parts B and D are both voluntary programs, and enrollees pay for them through premiums. The SMI trust fund is financed by beneficiary premiums and general government revenue funds. According to intermediate projections, Medicare Part B's growth rate will average about 8% to 9%, and Medicare Part D's annual growth rate will average 12.6% through 2016. Thus, Medicare Part B and D expenditures will grow significantly faster than the nation's economy, which is projected to grow at 4.8% on average during the same time period.

Future Implications

In the future, the nation's healthcare expenditures will likely continue to grow at a faster pace than the general economy. This growth will be driven by increases in the nation's population, the growth of the elderly, inflation within the healthcare sector, and new medical technology. This growth will continue to strain the nation's Medicare and state Medicaid programs. Taxes may have to be increased in order to pay for the growing expenditures, and

new public policies will have to be developed and implemented in order to control healthcare costs.

Kyusuk Chung

See also Cost Containment Strategies; Cost of Healthcare; Healthcare Financial Management; Health Economics; Health Insurance; Medicaid; Medicare; Medicare Part D Prescription Drug Benefit

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- Congressional Budget Office (CBO): <http://www.cbo.gov>

V

VOLUME-OUTCOME RELATIONSHIP

The volume-outcome relationship refers to the association between the number of patients with a specific diagnosis or surgical procedure treated at a hospital or by a surgeon and the outcomes experienced by those patients. Outcomes typically refer to mortality, but they can include other quality measures such as complications or health status. Although high volume has been shown to be associated with better outcomes across a wide range of conditions and procedures, the magnitude and nature of this association are highly variable. Moreover, the reasons for the observed associations are often unclear, and the policy and clinical implications of these studies are often confounded by important methodological issues regarding volume-outcome research.

Background

Training and repetition are necessary to learn the skills needed to expertly accomplish a surgical procedure or become familiar with protocols and organizational nuances in any particular hospital setting. However, the “practice makes perfect” hypothesis raises a series of questions when applied to the real world. How high is the threshold necessary to acquire competency? Once one achieves that threshold, for example, through rigorous training, do the skills deteriorate over time if not maintained? Does quality continue to get better with experience (or volume) above the

threshold—that is, should one seek out the highest-volume provider or just avoid those below a threshold level? For surgical procedures, is it just the volume of the primary surgeon, or do the skills of the anesthesiologist and other members of the team matter? In a set of procedures, such as coronary artery bypass graft (CABG), does volume matter for all cases or just for a subset of cases, such as the most risky patients or cases when an unexpected event occurs? An entirely different perspective on the simple association between volume and outcome is that the conventional wisdom is backward. That is, perhaps some physicians are just better than others and receive more referrals because of their better outcomes and thus have higher volumes; this is known as the selective-referral hypothesis. If so, are there subtle techniques and protocols that can be taught so that others with lower case volumes can also achieve better outcomes? There is no reason, moreover, to believe that both practice makes perfect and selective referral may not occur simultaneously, perhaps with differential importance for various conditions and procedures.

Harold Luft and colleagues’ 1979 article in the *New England Journal of Medicine* was the first to examine the volume-outcome relationship across a series of surgical procedures. This study examined the 1974–1975 discharge data from 1,498 hospitals on 12 surgical procedures. A volume-outcome relationship was observed for certain procedures, including open-heart surgery, coronary artery bypass, and vascular surgery, in which high-volume (defined as more than 200 procedures per year)

hospitals were associated with significantly lower mortality. However, for other services, such as colectomy and hip replacement, mortality also decreased with increasing hospital volume but stabilized at a much lower volume, between 10 and 50 procedures per year. Other procedures, such as cholecystectomy and vagotomy, showed no relation between volume and outcome.

Over the next 30 years, hundreds of studies in the health services research and clinical literature surfaced confirming the volume-outcome relationship for both hospitals and individual providers, although the evidence is stronger for the former. Those procedures and conditions that have been most studied include vascular surgery, cancer, and cardiac care. Important questions have surfaced regarding the volume-outcome relationship: What constitutes adequate volume, and how is this determined? Which procedures are the most sensitive to volume? To what extent is hospital volume—as opposed to physician volume—the key variable? How does one account for severity of illness of patients? Might there be selective biases in referral patterns? To what extent does accumulated experience, versus volume (or “throughput”) at a given point in time, account for good outcomes? What are the clinical and other implications of various policies potentially derived from the observed relationship? After three decades of work, these questions remain at the heart of volume-outcome research.

In 2000, Ethan Halm and colleagues conducted a literature review of 135 studies covering 27 different procedures. They found that the hospital-volume relationship was strongest for pancreatic cancer surgery, esophageal cancer, pediatric cardiac surgery, the treatment of AIDS, and abdominal aortic aneurysms. Weaker volume-outcome relationships were found for coronary artery bypass surgery (CABG), coronary angioplasty, orthopedic surgery, and some forms of cancer. In the largest volume-outcome study, published in 2002, John Birkmeyer and colleagues reviewed the experience of 2.5 million Medicare patients who had 1 of 14 procedures between 1994 and 1999. Mortality and volume were inversely related; however, there were large differences between high- and low-volume settings for esophagectomy and pancreatectomy and smaller differences for CABG and carotid endarterectomy. While the volume-outcome relationship has

been confirmed by many studies, the relationship varies significantly by clinical situation. Methodological issues, however, greatly influence the results and implications of the studies.

Methodological Issues

Various methodological issues are central to both understanding the volume-outcome relationship and drawing valid policy and clinical recommendations from the available studies. Such recommendations need to be based on a comprehensive assessment of the causal linkages (not just correlations) between volume and outcome, of the separate effects of hospital and physician volume, and of their effects over time as volumes change. Without an understanding of the potential weaknesses of studies, it is easy to overinterpret reported findings.

One of the most fundamental issues in assessing the volume-outcome relationship is that it is about outcomes—typically rare ones such as death—rather than quality as measured by process—that is, measuring whether the right thing was done for each patient in each circumstance. Health professionals rarely know the optimal processes of care and the mix of skills required to achieve the best outcomes, but instead they are seeking to identify the characteristics of physicians or hospitals—such as volume—that are associated with the best outcomes for their patients and then attempt to understand why or how they achieve those differentially better outcomes.

The focus on outcomes has several important implications for the underlying methods and approaches. Patient care is not like manufacturing; the results of an episode of care or treatment reflect not only the processes and skills of the providers and organizations but also the exact nature of the clinical problem (severity), what other medical problems the patient may have (comorbidities), and how that person reacts to treatment. These are issues commonly faced in the assessment of new drugs, for example, but the methodological solution there is to take a large number of reasonably similar patients and randomly assign them to the new drug and an alternative. Assuming that the samples are large enough, and in theory replicated, the randomization ensures that differences in the exact nature of the clinical problem, comorbidities,

and patient-specific effects are balanced between the two groups and any residual differences observed must be due to the effects of the drugs. There are no large-scale volume-outcome studies that have applied randomization techniques (it is difficult to imagine how one would do so), so statistical adjustments are needed to account for potential alternative explanations.

The last component—individual variability in response to identical treatment—controlling for all the potential measurable risk factors—is a problem of random variation that raises the statistical problems discussed later. The first two categories of problems, severity and comorbidities, are often addressed through what is termed *risk adjustment*. Risk adjustment involves the inclusion of various measures of disease severity and preexisting conditions to account for differences in outcomes apart from volume-related effects. There is a large literature on how to do risk adjustment, but statistical risk adjustment will most likely not be good enough to satisfy those who see randomization as the gold standard. Most volume-outcome studies are based on large numbers of patients and hospitals (or physicians), so the real concern is not the precision of the risk adjustment but the potential for the failings of risk adjustment to be plausibly associated with the key variable of interest—volume.

For an example of how this bias might occur, consider the following situation. Patients in teaching hospitals tend to have more thorough workups and documentation of their comorbidities simply because workups are a part of house-staff training. A patient admitted for a surgical procedure to a teaching hospital is likely to have more comorbidities coded than if admitted to a community hospital, where only the diagnoses directly related to the procedure may be recorded. Most risk adjustment models depend on the conditions coded, so this differential coding will make the patient appear to be sicker based on the information reported by the teaching hospital. With a higher expected risk of a bad outcome, the ratio of observed to expected outcomes across many such patients would be better in teaching hospitals than in community hospitals even if the bad-outcome rates were identical. As teaching hospitals tend to have higher volumes than community hospitals, this simple bias in reporting and coding could lead to the spurious observation of a volume-outcome effect.

The potential for biased estimates of the volume-outcome effects is heightened if one takes into consideration the selection of providers or patients. In many healthcare situations, the patient (or his or her referring physician) has a choice of specialists and sometimes hospitals to provide care. It is plausible that given the opportunity, some patients will seek out the most skilled clinicians; this would yield the observation of higher volume among the best providers, even if volume itself had nothing to do with the outcomes—the selective referral effect. However, when the risk factors of patients are assessed, it sometimes appears that the low-volume hospitals attract a mix of sicker patients—precisely the ones who would benefit the most from the expertise. This seems inexplicable until one realizes that the observed behavior may reflect the selective choice by those patients well enough to have the time to choose a facility. They will seek out the sites with the best reputations, leaving the low-volume ones with the sickest patients, who are not able to “shop.” If the risk adjustment models are not perfect, then the low-volume sites may appear to have worse risk-adjusted outcomes than they warrant.

These examples are not intended to suggest that there is no evidence for a true relationship between volume and outcome (although the causality may be unclear) but that inattention to careful risk adjustment and the potential for selection may overestimate the true relationship. Careful testing of the risk models and searching for hints of selection are important. Likewise, one should be sensitive to when these issues are likely to be problematic. For example, treatment of patients for heart attack, when emergency medical teams typically take the patient to the nearest hospital, is not likely to be subject to a great deal of selective referral. Surgical treatment of advanced cancer, however, may be highly sensitive to both selective referral by patients and even refusals by specialists, who may argue that there is little that can be usefully done.

Turning to the implementation of the studies, assessing the impact of volume on rare events such as death creates straightforward, yet often overlooked, statistical issues. Suppose that death occurs 5% of the time after a surgical procedure—actually a rather high mortality rate for most volume-outcome studies. With 20 patients, one would expect 1 death if quality was just average. This “average figure,” however, is the result of some

hospitals with 20 patients having 0 deaths, some having 1, and some having as much as 2, 3, or 4 deaths. The observed death rates are 0, 5%, 10%, 15%, and 20%, yet all are consistent with a true average quality of 5%. The deviations are simply due to chance, just as a fair coin when flipped 10 times will not always produce exactly 5 “heads.” Unfortunately, some observers point to the observation of 0 deaths in low-volume hospitals as evidence that “some low-volume hospitals have very good outcome rates.” This may be true, but it cannot be inferred by the observation of 0 deaths when only a small number are expected.

Another problem when examining the volume-outcome relationship is assessing the independent effects of physician (usually surgeon) and hospital volume. High-volume hospitals may have both high- and low-volume surgeons, and some high-volume surgeons may spread their patients over two or more hospitals. Overall, however, surgeon and hospital volume are probably highly correlated at the low end; low-volume hospitals are probably staffed mostly by low-volume surgeons, but there are many ways high-volume hospitals can achieve their patient loads.

The nature of the volume-outcome relationship is often subjected to only minimal testing. Some researchers simply test whether outcomes are better for patients using high-volume providers, but it is more important to understand the “shape of the relationship.” That is, if one were to plot mortality on the vertical axis and volume on the horizontal, does the curve look like a \backslash , an L, or a U? If mortality continues to fall as volume increases over the relevant range, only then will the highest-volume providers have the best outcomes. On the other hand, if outcomes cease improving after a certain point, it is critical to know that point. Even worse, there may be volumes above which outcomes actually get worse, and it is critical to know whether that is the case and also the volumes at which the best outcomes occur. Few studies use methods that allow the assessment of which of these alternative explanations best fit the data, yet the methods used often determine the findings.

Policy and Clinical Implications

Many studies assess the presence of a volume-outcome relationship, but this work is primarily

of interest because of the potential clinical relevance and policy implications. Are there particular processes or techniques that can be learned from the high-volume settings that can be transferred to those with lower volume? Should patients seek the hospital or physician with the highest volume, or should they simply avoid providers with less than a certain threshold of procedures? Should volume be used as a criterion in the development of preferred referral networks? What are the potential risks and benefits of regionalization? Should there be policies requiring a minimum volume of procedures or cases?

There are several approaches to disseminating volume-outcome data. Insurers and consumer groups have recently taken an interest in public dissemination of data on hospital volumes for specific surgical procedures, recommending that health plans and consumers use the data to choose high-quality hospitals. As discussed above, however, only some procedures have a significant volume-outcome relationship, and volume per se is hardly the optimal measure because it may lead providers to increase the number of cases done even if the care is unnecessary. It is far better to report risk-adjusted outcomes, but reporting outcomes can be quite complicated and controversial.

Physician education about the volume-outcome association is another option. Few physicians really know about the outcome rates (risk adjusted) of their own patients, let alone the outcomes of the specialists to whom they refer. A better understanding of the volume-outcome relationship may lead them to consider referring their patients to high-volume centers or at least ask about the quality of care of their colleagues. The Leapfrog Group advocates volume-based referral strategies, partially because other methods of improving quality of care are impractical or have other restrictions. For instance, process measures are unclear or controversial, regulatory approaches are unpopular, and health report cards have not been very successful in altering consumer behavior. Others, such as R. Dudley and colleagues, support referral strategies to either mandate or encourage the use of designated hospitals, guide professional training, justify restrictive licensing and certification of referral centers, and take a lead in the diffusion of new services.

Last, some view the volume-outcome relationship as suggesting minimum procedure volumes.

Minimum volume regulations, however, may result in more liberal surgical policies in hospitals that are at the fringe of meeting minimums or may be used as a rationale to preclude entry of competing providers. Insurers may also opt to engage in selective contracting to high-volume hospitals, which could have broader implications for low-volume hospitals because they may lose patients not only in the targeted procedure areas but in others as well.

Regionalizing specialty services is often justified by the volume-outcome relationship. High-volume hospitals, however, may be unable to sufficiently increase capacity to maintain capacity, and low-volume hospitals may suffer from being given a bad reputation, closing related services, or struggling with financial viability. In urban areas with many hospitals capable of offering services, concentrating care may not be problematic. In more sparsely served areas, however, regionalization may imply long travel times, and patients may delay or avoid care. Regionalization may lead to better outcomes for cases that can be scheduled but may actually worsen outcomes for emergencies because of the travel time needed to reach a “capable” site.

In summary, volume-based referral strategies have been advocated for procedures with the greatest outcome differences between low- and high-volume providers and for certain high-risk patient subgroups. Thirty years of research have shown that better outcomes are associated with higher volumes among hospitals and physicians, albeit varying greatly with condition and procedure. Methodological issues, however, are central to better understanding these questions and drawing meaningful policy and clinical implications. The volume-outcome relationship is best seen not as an end in itself but as an intermediate step toward better understanding how to achieve improved patient outcomes.

Harold S. Luft and Beth Newell

See also Health Planning; Health Report Cards; Hospitals; Leapfrog Group; Outcome Movement; Physicians; Quality of Healthcare; Structure-Process-Outcome Quality Measures

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American Health Planning Association (AHPA): <http://www.ahpanet.org>

California Hospital Assessment and Reporting Taskforce (CHART): <http://www.calhospitalcompare.org>

Joint Commission: <http://www.jointcommission.org>

VULNERABLE POPULATIONS

Vulnerable populations are groups of people whose health needs are not addressed by conventional service providers. Vulnerable populations can include the very young; the elderly; women; racial minorities; those of low socioeconomic status; those experiencing geographic, lingual, or cultural isolation; limited- or non-English-speaking people, those who are incarcerated; immigrants, refugees, and those with undetermined legal status; transient and homeless people; the uninsured; people with

disabilities; people with psychiatric, cognitive, or developmental disorders; substance/alcohol abusers; those who have to deal with abusive families; and people living with HIV/AIDS. This list is not all-inclusive, as society is in a constant state of flux. However, vulnerable populations are usually composed of people who have been marginalized by society. It is because of their inability to access, understand, and/or act on health information or obtain medical treatment that is available to the general population that these populations are considered vulnerable.

The aging process leads to mental, physical, hearing, and vision impairments, as well as a decline in physical mobility. Women are slightly more prone to physical, emotional, or mental limitations than men, and they are nearly twice as likely to require help with personal care as men after age 65. Rural residents are disadvantaged by virtue of having higher rates of reported poor health, physical activity limitations, and remoteness from healthcare than metropolitan residents. Those with transportation challenges include the disabled, the elderly, the poor, and those living in remote areas. Vulnerable populations are more likely to live and work where environmental factors expose them to a higher risk of poor health. Vulnerabilities are often compound, leading to additional unmet needs.

The federal Healthy People 2010 initiative earmarked the elimination of health disparities as second on its list of goals, drawing attention to the stark reality that despite the great strides made in improving population health, a void still exists in providing equitable healthcare to all segments of the nation's population. When compared with their more privileged counterparts, disadvantaged or vulnerable populations have higher prevalence, morbidity, and mortality rates for most conditions. Rising healthcare costs in the 1990s led to increased health disparities and raised political interest in healthcare reform.

The aftermath of Hurricanes Katrina and Rita exposed the disparities faced by vulnerable populations in accessing healthcare and emergency medical relief in times of environmental disasters. It fueled an interest in public health preparedness to avoid such disasters. In 2005, the U.S. Environmental Protection Agency (USEPA) defined *vulnerability* as susceptibility or sensitivity, different exposure, differential preparedness, and/or

differential ability to recover. The National Environmental Justice Advisory Council (NEJAC) of 2006 recommended that, to avoid such contingencies in the future, vulnerable populations need to be identified and their environmental and/or public health needs assessed through the use of tools such as the Environmental Justice Geographic Assessment Tool. It recommended greater coordination of all resources, including the vulnerable groups, in planning and implementing new disaster response procedures.

The Office of Minority Health and Health Disparities (OMHD) is responsible for eliminating health disparities and improving the health of all ethnic and racial minority populations, who largely constitute vulnerable populations. Fifteen special programs, administered by the U.S. Department of Agriculture (USDA), cater to the health and nutritional needs of vulnerable populations, especially children, pregnant women, the elderly, rural residents, and the poor. Nearly 20% of Americans use at least one food assistance program per year. About half of all infants and 25% of children between the ages 1 and 4 participate in the Special Supplemental Nutrition Program for Women, Infants, and Children (known as the WIC program), and school nutrition programs provide healthy meals to about 30 million children nationwide. The Food Stamp program assists about 30 million low-income Americans in meeting their nutritional needs.

Vulnerability in Healthcare Research

Vulnerable populations are particularly susceptible to exploitation in healthcare research, exemplified by the horrendous experiments conducted by the Nazis on Jews in concentration camps in World War II. The Nuremberg Code of 1947 was established to prevent such exploitation: It laid down the code of informed consent, whose critical components were that all participants must have adequate knowledge of, and comprehend, the proposed research and must be enrolled without duress. Subsequently, the Belmont Report, the National Research Act, and the National Bioethics Advisory Commission (NABC) have created mandatory rules to protect all segments of society from harmful inclusion in research protocols. Institutional review boards (IRBs) are responsible

for ensuring that the tenets of American biomedical ethics—autonomy, nonmaleficence, beneficence, and respect for persons in the research context—are followed in all research protocols. The 2001 NABC report identified six groups as “caution areas” for inclusion in health research: those with institutional, deferential, medical, economic, or social vulnerability and people with communication/cognition problems.

The 2007 *National Healthcare Disparities Report* points out persistent, even increasing, disparities in healthcare among all minority populations, even after accounting for demographic and insurance factors. And nearly half of the nation’s population is predicted to consist of “minority groups” by 2050. A large percentage is composed of people who have limited skills in understanding and/or speaking English. The elderly population is expected to rise briskly as longevity increases, bringing in its wake vulnerability to disability, disease, and dependence. The number of uninsured, illegal residents, and refugees continues to increase annually. These factors will add to the number of people considered vulnerable to inequitable healthcare. It is imperative that policymakers consider steps to improve healthcare provision to this growing segment of the nation’s population. The use of community-based, culturally and linguistically appropriate, interventions is thought to be the most effective approach in improving the health of vulnerable populations.

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See also Disability; Epidemiology; Ethnic and Racial Barriers to Healthcare; Health Disparities; Healthy People 2010; National Healthcare Disparities Report (NHDR); Public Health; Risk

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- Healthy People 2010: <http://www.healthypeople.gov>
- Office of Minority Health (OMHD): <http://www.cdc.gov/omhd>
- Robert Wood Johnson Foundation (RWJF): <http://www.rwjf.org>

W

WARE, JOHN E.

John E. Ware, Jr. is a pioneer in the area of quality-of-life assessment and an internationally recognized expert in the field. Ware is noted for being the principal developer of the Short Form 36 (SF-36) Health Survey, one of the most widely used quality-of-life assessment tools in healthcare research. Ware is the founder and president and chief scientific officer of Quality Metric, Inc., an Internet-based healthcare technology company that uses the latest innovations in measurement technology to monitor health outcomes of consumers. Ware is also executive director of the Health Assessment Laboratory and a research professor at the Tufts University School of Medicine.

Ware received his bachelor's and master's degrees in psychology from Pepperdine University in California and completed his doctoral degree in educational measurement and statistics at Southern Illinois University in 1974. While working toward his doctorate, Ware became director of the Measuring Health Concepts Research Project at the University of Southern California School of Medicine and director of the Postgraduate Division in the Department of Psychiatry. In 1972, Ware was appointed assistant professor at the Southern Illinois University School of Medicine, and in 1975, he became a senior research psychologist at the RAND Corporation in the Behavioral Sciences Department and Health Sciences Program. Following this, Ware joined the faculty at Pepperdine University as an instructor and was an

adjunct professor and research advisor for the Clinical Scholars Program at the University of California, Los Angeles, Schools of Medicine and Public Health. In 1988, Ware became senior scientist at the Health Institute at Tufts New England Medical Center in Boston, and eventually, he took on the role of director of the International Quality of Life Assessment Project at Tufts University.

As a result of a research program at the Health Institute of New England Medical Center, the Health Assessment Laboratory was founded in 1988 as a nonprofit organization, located in Waltham, Massachusetts, where Ware is the executive director. The Health Assessment Laboratory conducts basic research on patient-reported outcomes and works in close association with the Health Institute.

Ware was the principal investigator for the Medical Outcomes Study (MOS), which developed the SF-36 Health Survey as well as other widely used health assessment tools. The experience of the SF-36 Health Survey has been cited in nearly 7,500 publications and used in approximately 1,000 clinical studies, and it was judged to be the most widely evaluated patient-assessed health outcome measure.

Ware is a member of many advisory groups, including the Social Security Administration's Disability Evaluation Study, the Joint Commission's Council on Performance Measurement, and the National Committee for Quality Assurance's Technical Advisory Group. He is an elected member of the National Academy of Sciences, Institute of Medicine (IOM). In 2003, he received the

International Society for Quality of Life Research President's Award for his pioneering and tireless work in advancing the ability to assess health-related quality of life.

Ware has made transformative contributions to the field of health related to psychometric theory and improving the measurement of patient outcomes. He is currently developing computer software and Internet applications to assess risk and monitor the health outcomes of patients.

Gregory Vachon

See also Disease; Health; Health Indicators, Leading; Measurement in Health Services Research; Morbidity; Mortality; Quality of Life, Health-Related; Short-Form Health Surveys (SF-36, -12, -8)

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Quality Metric: <http://www.qualitymetric.com>

WENNBERG, JOHN E.

John E. Wennberg is a pioneering health services researcher who is perhaps best known for his focus on geographic variations in medical care. He was one of the first researchers to document that geographic variations in medical care, which affect the cost and quality of patient care, are primarily due to physician treatment styles. His work is best exemplified in his major ongoing project, *The Dartmouth Atlas of Health Care*. By attracting the U.S. Congress's attention to outcomes research, Wennberg also helped shape the federal legislation that established the Agency for Health Care Policy and Research (now the Agency for Healthcare Research and Quality [AHRQ]).

Wennberg earned his bachelor's degree from Stanford University (1956) and his medical degree from McGill University (1961). He trained in internal medicine, followed by a fellowship in nephrology, at Johns Hopkins University. While there, he became interested in epidemiology, which led him to earn a master of public health degree from the Johns Hopkins University School of Hygiene and Public Hygiene (1966).

In the early 1970s, Wennberg along with Alan Gittelsohn developed the methodology of small-area analysis for analyzing healthcare utilization based on population and geographic area. Anecdotally, he was able to refine his research questions on seeking care for his son's tonsillitis: His local Vermont pediatrician recommended tonsillectomy, while the one in a neighboring town across the state border into New Hampshire counseled "watchful waiting." Wennberg was puzzled why medical practice could vary so dramatically over such a short distance. When he compared data on other medical procedures in other locales, other startling differences emerged: Not only does medical intervention and thus spending vary by region, but Wennberg's analyses also showed that different hospitals within the same region often have drastically different healthcare utilization patterns. Most strikingly, what at first seemed heretical has now been well accepted: More medical spending and more healthcare services are not associated with better patient outcomes.

Wennberg has been a professor in the Department of Community and Family Medicine at Dartmouth University since 1980 and in the Department of Medicine since 1989. In 1988, he became the founding director of the Center for the Evaluative Clinical Sciences, now called the Dartmouth Institute for Health Policy and Clinical Practice. In 1989, Wennberg cofounded the Foundation for Informed Medical Decision Making, based on the idea that a better-educated patient will have a safer and more positive experience in the healthcare system when engaged in shared decision making with his or her physician. In 1994, he became the Peggy Y. Thomson Professor of the Evaluative Clinical Sciences, the nation's first endowed chair in clinical evaluative sciences, the field he created. In 1996, Wennberg published the inaugural *Dartmouth Atlas of Health Care*. Updated every 2 years, the *Atlas* is a

compendium of color-coded thematic maps dividing the United States into geographic regions based on relative rates of health service utilization in a given time period.

During his distinguished career, Wennberg has received many awards and honors in recognition of his work. He is an elected member of the national Institute of Medicine (IOM). He has received the Association for Health Services Research's Distinguished Investigator Award, the Baxter Foundation's Health Services Research Prize, the Richard and Hinda Rosenthal Foundation Award in Clinical Medicine, and the Picker Institute Award for Career Achievement in Patient-Centered Care. In 2007, he was named the most influential health policy researcher of the past 25 years by the journal *Health Affairs*, and he received the Joint Commission's Ernest Amory Codman Award for his leadership in using outcome measures to improve healthcare quality.

John Henning Schumann

See also Agency for Healthcare Research and Quality (AHRQ); Epidemiology; Geographic Barriers to Healthcare; Geographic Information Systems (GIS); Geographic Variations in Healthcare; Outcomes Movement; Public Health; Quality of Healthcare

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<http://www.dartmouthatlas.org>
 Dartmouth Institute for Health Policy and Clinical Practice: <http://www.dartmouth.edu/~cecs>

WHITE, KERR L.

Kerr L. White is arguably the founder of the discipline of health services research in the United States. Throughout his long and distinguished career as a researcher, university professor, and government and foundation administrator, he developed the conceptual framework of health services research, established and shaped government health services research programs, and funded the emerging discipline of health services research.

White was born in Winnipeg in 1917, and he grew up in Ottawa, Canada. His father was a foreign correspondent for the London *Times* and the *Economist*, and his mother operated a lending library that emphasized various medical topics. He majored in economics and political science at McGill University, followed by graduate study in economics at Yale University. During World War II, he interrupted his graduate studies to serve in the Royal Canadian Army. After the war, he undertook medical training at McGill University, graduating in 1949. White completed his residency in internal medicine at Dartmouth College's Hitchcock Clinic and Hospital and a fellowship at McGill's Royal Victoria Hospital in the departments of medicine and psychiatry. He then joined the Department of Internal Medicine at the University of North Carolina–Chapel Hill as an assistant professor of medicine and preventive medicine. In 1962, White was appointed chair of the Department of Epidemiology and Community Medicine at the University of Vermont. In 1965, he moved to Johns Hopkins University to establish the Division of Hospitals and Medical Care, which later became the Department of Health Care Organization. In 1978, he became the deputy director for health sciences at the Rockefeller Foundation. White retired in 1984, remaining active in the health research community as a thought leader and as a mentor.

White's professional legacy can be divided into three domains: (1) scholarship, which defined the field of health services research; (2) training and mentoring leaders in this new field; and (3) the development of programs and other initiatives that have a sustained impact on the research on healthcare quality and the delivery of quality medical care.

While he was a 2nd-year medical student in 1947, White published his first article, which predicted many of the methodological and substantive domains of health services research and their relation to what would eventually be known as evidence-based medicine. At the University of North Carolina, White formulated the key ideas, which he expounded in 1961 in a seminal *New England Journal of Medicine* article that he coauthored, "The Ecology of Medical Care." White stressed, in addition to the appropriate use of methodological tools to conduct health care research, that society has an obligation to allocate healthcare resources as efficiently and effectively as possible to improve the quality of medical outcomes, benefiting both patients and providers. Moreover, he stressed that healthcare research was concerned with medicine as a social institution. White has authored or coauthored some 250 publications, including 11 books.

White proved instrumental in institutionalizing health services research, both through his editorial influence in journals such as *Medical Care* and *Health Services Research* and ensuring funding for the *International Journal of Health Services*, and through his vision in developing the organizational framework for the National Center for Health Services Research (NCHSR), which eventually became a federal agency and in 1999 was reauthorized as the Agency for Healthcare Research and Quality (AHRQ).

In recognition of White's role in establishing the field of health services research, Emory University dedicated a new center, the Kerr L. White Institute for Health Services Research, in his honor in 1996, and the Agency for Healthcare Research and Quality (AHRQ) established the Kerr White Visiting Scholars Program in 2000.

David J. Ballard and Robert S. Hopkins, III

See also Agency for Healthcare Research and Quality (AHRQ); Brook, Robert H.; Epidemiology; Evidence-Based Medicine (EBM); Health; Health Services Research, Origins; Public Health; Wennberg, John E.

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<http://historical.hsl.virginia.edu/Kerr>

WILENSKY, GAIL R.

Gail R. Wilensky is a well-known and highly respected health economist. She has been associated with Project HOPE (Health Opportunities for People Everywhere) for many years, she was the administrator of the Health Care Financing Administration (HCFA), and she serves on many important national and international healthcare committees.

Born in 1943 in Detroit, Michigan, Wilensky attended the University of Michigan, where she

earned a bachelor's degree in psychology (1964), a master's degree (1965), and a doctoral degree in economics (1968).

After graduation, Wilensky served as a staff economist on the President's Commission on Income Maintenance Programs until 1969, when she became executive director of the Maryland Council of Economic Advisers. In 1971, she served as a senior research associate at the Urban Institute until 1973, when she accepted the position of visiting assistant professor and associate research scientist at the University of Michigan. In 1975, she worked for the National Center for Health Services Research (now the Agency for Healthcare Research and Quality), where she was a health service fellow and senior research manager. In 1983, she joined Project HOPE as vice president of health affairs. In 1990, President George H. W. Bush appointed her administrator of the Health Care Financing Administration (HFMA) (now the Centers for Medicare and Medicaid Services [CMS]). In 1992, she became deputy assistant to the President for policy development at the White House. She returned to Project HOPE in 1993 as the John M. Olin Senior Fellow, where she continues to analyze and develop healthcare policies, advise government and private-sector agencies, and write and lecture on various healthcare topics.

Wilensky has served on a number of important healthcare committees, including the Advisory Committee on Health of the General Accounting Office (GAO), the Physician Payment Review Commission (PPRC), the Medicare Payment Advisory Commission (MedPAC), and the President's Task Force to Improve Health Care Delivery for Our Nation's Veterans. She also has served on many committees of the National Academy of Sciences, Institute of Medicine (IOM).

Currently, she serves as a member of the President's Commission on Care for America's Returning Wounded Warriors; Commissioner of the World Health Organization (WHO) Commission on Social Determinants of Health; vice chair of the Maryland Health Care Commission; member of the Board of Trustees of the University of the Sciences in Philadelphia; member of the National Campaign to Prevent Teen Pregnancy; director of the American Heart Association; trustee of the National Mineworkers of America's Combined Benefits Fund; trustee of the National Opinion

Research Center (NORC) at the University of Chicago; director, chair, and vice chair of AcademyHealth; cochair of the Task Force on the Future Health Care at the U.S. Department of Defense; and member of the board of directors for Cephalon Corporation.

Wilensky has received numerous awards and honors, including the Darrel J. Mase Distinguished Leadership Award from the University of Florida (2000), the Latiolais Honor Medal from the American Managed Care Pharmacy Association (1996), the Dean Conley Award from the American College of Healthcare Executives (1989), and the Alumna in Residence Award from the University of Michigan (1989). She has received honorary degrees from the University of the Sciences (2002), Rush University (1997), and Hahnemann University (1993). She was named Marshall J. Seidman Lecturer at Harvard Medical School (2003), John D. Thompson Distinguished Visiting Fellow at the Yale Health Management Program (2003), TeKolste Scholar at the Indiana Hospital and Health Association (1997), and Flinn Foundation Distinguished Scholar in Health Policy and Management (1986). Additionally, Wilensky is listed in *Who's Who in America* and *Who's Who in American Women*. She was named as one of the 100 most powerful people in healthcare in 2003 and 2004, and in 2005, she was named as one of the top 25 women in healthcare by *Modern Healthcare*.

Amie Lulinski Norris

See also Centers for Medicare and Medicaid Services (CMS); Health Economics; Medicaid; Medicare; Project HOPE; Public Policy

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WILLIAMS, ALAN H.

Alan H. Williams (1927–2005) was an eminent health economist in the United Kingdom. Williams was a professor of economics at the University of York. At York, he was instrumental in establishing the university's Centre for Health Economics and its graduate program in health economics. During his long and distinguished career, he studied two broad research areas: ways of valuing health and the equity of health and healthcare. Williams is perhaps best known as the originator of the concept of quality-adjusted life years, or QALYs, a measure of health benefits. Today, QALYs are widely used by researchers to measure and compare healthcare technology and treatments.

Williams was born in Birmingham, England, in 1927. He was educated at the Birmingham King Edward's School. After graduation in 1945, he served in the Royal Air Force for 3 years. In 1948, Williams attended the University of Birmingham, where he graduated in 1951 with a bachelor's degree in economics. He continued his education doing graduate work at the Universities of Uppsala and Stockholm. From 1954 to 1963, Williams was a lecturer in economics at the University of Exeter, where he taught courses in public finance. During sabbaticals he taught at the Massachusetts Institute of Technology (MIT) and Princeton University. In 1964, he moved to the newly established University of York, where he was appointed a senior lecturer and reader in economics. Williams would teach and conduct research at that university for more than 40 years.

Besides his academic career, Williams also worked occasionally for the government. From 1966 to 1968, he was seconded (a temporary move or loan of an employee to another organization) to

Her Majesty's Treasury as the director of economic studies. At the Treasury, he developed courses in economics for civil servants. He also worked with the Ministry of Health, where he investigated its hospital building program. In 1976, Williams was appointed to the Royal Commission on the National Health Service (NHS). However, in 1978, he resigned over a dispute on the role of researchers working for the commission.

In 1987, Williams convened a meeting in Rotterdam, The Netherlands, of his colleagues and challenged them to determine how the value of health might be measured and how such values might be studied across nations. The group eventually became the EuroQol Group, which developed the EQ-5D, a series of health status measures that are widely used throughout the world.

In his later years, Williams became increasingly interested in the ethical issues determining priorities in healthcare. He expounded the concept of "fair innings." The concept reflects the general belief that everyone should achieve a long life and that if someone dies at a young age, the person is somehow cheated—death at 20 is clearly viewed very differently from death at 80. Williams argued that entitlement to healthcare ought to take into account such differences in perspectives. And more resources should be given to the young who have not had their fair innings.

Williams died in 2005 at the age of 77. In 2006, the University of York's Centre for Health Economics established the Alan Williams Health Economics Fellowships as a lasting tribute to his work and achievements.

Ross M. Mullner

See also Health Economics; Public Policy; Quality-Adjusted Life Years (QALYs); Rationing Healthcare; Technology Assessment; United Kingdom's National Health Service (NHS); United Kingdom's National Institute for Health and Clinical Excellence (NICE)

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Web Sites

EuroQoL Group: <http://www.euroqol.org>
 United Kingdom's National Institute for Health and Clinical Excellence (NICE): <http://www.nice.org.uk>
 University of York, Centre for Health Economics (CHE): <http://www.york.ac.uk/inst/che>

WOMEN'S HEALTH ISSUES

Women are often the healthcare takers and decision makers of their family's health. During the past several decades, women's health issues have broadened from a focus primarily on reproductive and social issues to include research on gender differences in disease prevention and response to treatment. Although many advances have been made in improving women's healthcare and in understanding women's unique role in the healthcare system, there are significant gaps in areas such as access to healthcare, ability to pay for care, and healthcare outcomes. Several key issues for women's health remain, including the need for further studies, changes in public policy, and increased advocacy.

Health Maintenance

There is overwhelming evidence that preventive healthcare services, particularly among women, favorably affect health outcomes. However, many women often underuse the preventive services. Screening tests are an important tool for the early detection and treatment of various diseases, yet the use of some screening tests by women is declining. A national survey conducted by the Kaiser Family Foundation in 2004 indicates that screening rates for mammograms, pap smears, and blood pressure have decreased slightly since 2001.

Additionally, reproductive care is a significant part of healthcare for women. One of the goals of the Healthy People 2010 initiative of the U.S. Department of Health and Human Services (HHS) is to increase the proportion of pregnant women who receive early and adequate prenatal care to 90% of all pregnancies in the nation. While there has been an overall steady improvement, statistics show a slower rate of increase among minority women, particularly in obtaining early prenatal care.

Being overweight or obese increases adverse health risks, including high blood pressure, diabetes, heart disease, stroke, arthritis, cancer, and poor reproductive health. According to the Centers for Disease Control and Prevention (CDC), 61.5% of all women and 69.6% of men in the nation were overweight or obese in 2003–2004. Furthermore, regular physical activity has been shown to promote health, prevent disease, and facilitate maintenance of a healthy body weight. In 2005, only 50.9% of women reported engaging in at least 10 minutes of moderate leisure-time physical activity per week, and only 32.0% reported at least 10 minutes of vigorous activity, which was significantly less than that reported by men. In contrast, smoking was less common among women 12 years of age or older (22.5%) compared with men of the same age group (27.4%). In addition, women were more likely than men to try to quit smoking (44.8% vs. 40.7%).

Access to Healthcare

Access to quality healthcare services directly affects many aspects of women's health. Numerous studies have found that women who have a usual source of healthcare are more likely to receive preventive care, to have access to care, to receive continuous care, and to have lower rates of hospitalization and lower healthcare costs than those who do not have a usual source of care. Women of all racial and ethnic groups are more likely than men to have a usual source of care. However, access to healthcare is a greater challenge for women who are members of racial or ethnic minority groups with low incomes and who are uninsured. Regardless of family structure, women are more likely than men to live in poverty. Uninsured women consistently fare worse on multiple measures of access to care, including

contact with providers, obtaining timely care, access to specialists, and utilization of screen tests.

Many studies have also shown that women who lack economic resources or are from racial or ethnic minorities are more likely to report poor health status and greater chronic health problems and are more likely to confront obstacles to receiving adequate and timely care. Women not only have financial barriers to accessing healthcare but also may experience logistical barriers, such as problems with transportation, childcare, and lack of free time. Among women with family incomes at 300% or more above the federal poverty level (FPL), 73% reported excellent or very good health status compared with 42% of those with family incomes below 100% of the FPL. Women who are Latinas, of low economic status, single, and young are particularly at risk of being uninsured.

Healthcare Costs

There is a significant gender gap in health insurance coverage and the ability to afford medical care in the United States. Women are disadvantaged by greater healthcare needs and lower incomes than men. Men are more likely than women to be uninsured in every age group; however, there are an estimated 16 million uninsured women in the nation. Many studies have shown that women are more likely than men to go without healthcare services because of the costs of healthcare and also because they have higher out-of-pocket expenses. A 2005 survey by the Kaiser Family Foundation indicates that 33% of insured women and 68% of uninsured women do not get the healthcare they need because they cannot afford it as opposed to 23% of insured and 49% of uninsured men who avoid care because of the costs. Researchers also found that 16% of women are underinsured, meaning they have high out-of-pocket costs compared with their income, while only 9% of men are underinsured. Among workers, women are less likely than men to be eligible for and to participate in their employer's health insurance plans. The overall take-up rate for employer-sponsored coverage is 80% for women workers compared with 89% for men. This is in part because women are more likely to work part-time, have lower incomes, and rely more on spousal coverage.

Uninsured women are more likely to suffer serious health problems, partly because they tend to

wait too long to seek treatment or preventive care. The lack of health insurance can even be deadly, as research has shown that uninsured adults are more likely to die earlier than those who have insurance. According to the Kaiser Family Foundation survey, in 2004, one in six women nationwide who had health insurance delayed or went without needed care. Reproductive healthcare services accounted for much of this discrepancy. Thirty-nine percent of women with insurance reported difficulty paying their medical bills compared with 29% of men. The gender gap in healthcare insurance coverage and access to care has other contributing factors: For instance, women are more likely to purchase coverage in the more expensive and less comprehensive individual health insurance market and are more likely than men to take prescription drugs.

Quality of Healthcare

The report *Making the Grade for Women's Health: A National and State-by-State Report Card*, published in 2007 by the National Women's Law Center, on the status of women's healthcare in the United States, based on the goals set by Healthy People 2010, gave the nation an overall grade of "unsatisfactory" because it met only 3 of the 23 benchmarks for women's health. The report found that no state met the goal for access to health insurance. Additionally, the report highlighted the many regional differences in the health status of women. In 2005, fewer women were satisfied with how well their physicians communicated with them (81.0%), compared with men (84.3%). Men were also more likely than women (67.0% vs. 62.5%) to be satisfied with their ability to get necessary care from physicians or specialists, including obtaining treatments and tests.

Cardiovascular disease is the leading cause of death for women in the United States. Despite advances in the evaluation and management of heart disease, it is estimated that more than 240,000 women die annually from this condition. In 2005, adult women below 45 years of age had a higher rate of heart disease than men of the same age (50.9 vs. 35.2 per 1,000 adults, respectively), but men had a higher overall rate of heart disease than women. The highest rate of heart disease was among non-Hispanic White women (128.7 per

1,000), followed by non-Hispanic Black women (107.1 per 1,000). Asian women had the lowest rate (51.1 per 1,000) of heart disease among all ethnic groups. Although non-Hispanic White women experience the highest rates of heart disease, deaths from heart disease are highest among non-Hispanic Black women.

According to the Kaiser Family Foundation survey of 2005, women largely underused preventive healthcare measures, such as lifestyle modifications. Although major risk factors for heart disease can often be prevented or controlled through lifestyle changes, physicians are less likely to counsel women than men about diet, exercise, and weight reduction.

In 2004, the American Heart Association (AHA) released the first evidence-based guidelines for cardiovascular disease prevention for women. Embedded in its recommendations are lifestyle interventions that have become the cornerstone of many preventive programs. The current prevention efforts have shifted away from individual disease-specific targets to assessment of "global," or overall, risk. The lifestyle interventions have received the highest level of recommendation from the AHA (Class 1) and include the following: (a) encouraging cessation of cigarette smoking; (b) encouraging daily physical activity for a minimum of 30 minutes at moderate intensity; (c) consumption of a heart-healthy diet—restriction of intake of trans-fatty acids and saturated fat to less than 10% of calories; and (d) weight maintenance/reduction with a target body mass index (BMI) between 18.5 and 24.9 kg/m² and a waist circumference of less than 35 inches.

Cancer is the second leading cause of death of women in the United States. Furthermore, the most common cause of cancer deaths in women is lung cancer. It is estimated that more than 70,000 women in the nation die of lung cancer each year, with the majority of these deaths linked to cigarette smoking. Breast cancer is the second leading cause of cancer death in U.S. women, resulting in nearly 40,000 deaths each year, but it is the most common type of cancer among women. For each of the sex-specific cancers, such as breast, uterine, and ovarian cancer, survival rates are higher for White women than for Black women.

Stroke is a major cause of morbidity and mortality and the third leading cause of death of

women in the United States. Nearly 160,000 people in the country die of stroke each year, and almost two thirds of them are women. There are important racial and ethnic disparities in the incidence, severity, and mortality of stroke. Minority ethnic groups have higher rates of more severe strokes. In addition to the roles of primary and secondary prevention, it has been suggested that to address these disparities in stroke outcomes, initiatives that foster cultural competence must be a prominent component of a targeted approach. Primary prevention of stroke includes adequate blood pressure control and the reduction and treatment of elevated cholesterol.

In 2005, the CDC estimated there were 10,774 new cases of AIDS in the United States among adolescent and adult women, compared with 29,766 new cases among males of the same age group. AIDS has disproportionately affected men, but the rate among women is increasing at a faster pace. Since 2001, new AIDS cases have increased by 7.2% among women compared with a 6.7% increase among men. Women are biologically more susceptible to HIV infection during sexual intercourse and experience different clinical symptoms and complications. Many studies have shown that women with HIV not only face limited access to care but also experience disparities in access compared with men. Women with HIV are less likely to receive combination drug therapy and fare more poorly on other access measures than men. Compared with men, women with HIV are more likely to postpone care because of lack of transportation and more likely to be too sick to go to the physician.

Minority women also are disproportionately affected by a number of diseases and health conditions, including HIV/AIDS, sexually transmitted infections, diabetes, and overweight or obesity. In 2004, HIV/AIDS was the leading cause of death among non-Hispanic Black women 25 to 34 years of age.

Mental health is an often overlooked but critical aspect of women's healthcare. One of the biggest threats to a woman's overall health is impairment of her mental health. Studies have shown a positive relationship between the frequency and severity of negative social factors and occurrences and the frequency and severity of mental health problems experienced by women.

Despite the increasing prevalence of mental illness among both men and women, there are remarkable gender differences in patterns of mental illness. Slightly less than a quarter of women (23%) in the nation report having been diagnosed with depression or anxiety, over twice the rate of men (11%). Women attempt suicide three times more often than men, but men are much more likely to be successful in taking their lives. Risk factors for the more common mental disorders include the following: gender-based violence, socioeconomic factors, low income and income inequality, inferior social standing, and unalleviated responsibility for the welfare of others. Women now have the highest rates of post-traumatic stress disorders, a direct result of the increasing prevalence of sexual violence against women. The lifetime prevalence rate of violence against women ranges from 16% to 50%.

Healthcare Utilization and Outcomes

Over the course of a woman's life, her use of the healthcare system mirrors her changing healthcare needs, from reproductive health in the younger years to a surfacing of chronic illness during middle age and increased rates of physical limitations with advanced age. Most women in the nation are in good health, with 8 in 10 reporting excellent, very good, or good health, according to a 2005 Kaiser Family Foundation survey. There are, however, racial and ethnic disparities in these statistics. In 2005, 62.3% of non-Hispanic White women reported themselves to be in excellent or very good health, compared with only 53.6% of Hispanic women and 51.6% of non-Hispanic Black women. Men were more likely than women to report being in excellent or very good health (63.0% vs. 59.9%), and this result holds across every racial and ethnic group. However, a considerable number of women—nearly 20%—are in fair or poor health. The proportion of women reporting that they are in fair to poor health increases with age to nearly one third of women 65 years of age or older. Slightly more than a third of women reported a chronic condition requiring ongoing medical attention compared with 30% of men. As women age, there is an associated increase in the incidence of chronic conditions.

Medical outcomes research has determined that women are disproportionately affected by chronic

diseases for which clinical data are not easily generalized and traditional medical measures are inadequate. Historically, women have faced unequal treatment, with numerous studies reporting that women on average have fewer medical interventions than their male counterparts. There is evidence in the medical outcomes literature to suggest increasing ethnic disparities in incidence, severity, and mortality for a number of prevalent diseases. In the past decade, there has been a move from defining outcomes using traditional measures of morbidity and mortality to a greater emphasis on quality of life, function, patient satisfaction, and health status. The use of gender-sensitive outcome measures is essential to bridge the discrepancy between quality initiatives at the global level and what actually works at the grassroots level for improving women's healthcare. Such a shift is empowering for women and should translate into comparable health outcomes between men and women in the future.

Future Implications

It is important to understand the current issues concerning women's health and the unique role women play not only as consumers of healthcare but also as leaders in their families in healthcare decision making, as these have salient implications for public health and public policy advocacy. Significant strides have been made in recent decades in understanding not only the physiological but also the sociological health issues faced by women. Despite these advances, however, there is more work to be done in reducing the gender gap in access to healthcare, ability to pay for care, and quality of healthcare outcomes.

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See also Access to Healthcare; Acute and Chronic Diseases; Health Disparities; Life Expectancy; Obesity; Quality of Healthcare; Uninsured Individuals; Vulnerable Populations

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- Henry J. Kaiser Family Foundation (KFF): <http://www.kff.org>
- National Institutes of Health (NIH), Office of Research on Women's Health (ORWH): <http://orwh.od.nih.gov>
- National Women's Law Center (NWLC): <http://www.nwlc.org>
- U.S. Department of Health and Human Services (HHS), National Women's Health Information Center: <http://www.hrsa.gov/WomensHealth>
- U.S. Food and Drug Administration (FDA), Office of Women's Health: <http://www.fda.gov/womens>

WORLD HEALTH ORGANIZATION (WHO)

The World Health Organization (WHO) is the directing and coordinating authority for health within the United Nations (UN). The WHO was officially constituted at the International Health Conference held in New York City from June 19

to July 22, 1946. WHO began operating on April 7, 1948.

The WHO is an intergovernmental organization (IGO), and its members are the states (countries) recognized by the UN. The 193 member states of the UN pay regulated contribution fees, which partially fund the WHO. In addition, many member states also pay voluntary contributions to fund regular or extrabudgetary programs. Member states also contribute technical expertise either through personnel quotas or through work carried out by national collaborating centers or experts who take active roles in research and technical or advisory committees and extrabudgetary activities.

The total biennial budget for the WHO in 2006–2007 was approximately \$3.3 billion. Those funds were allocated into four major areas: (1) about half of the funds (53%) are spent on essential health interventions (i.e., HIV/AIDS prevention and treatment, child and adolescent health, communicable disease prevention and control, malaria control and prevention, mental health and substance abuse programs, reproductive health, tuberculosis control and prevention, and emergency and epidemic preparedness programs); (2) about one fifth of the funds (21%) are spent on effective support for member states (i.e., WHO's core presence in countries, direction, external relations, governing bodies, planning resource and coordination, knowledge, budget and financial management, and infrastructure and logistics); (3) about 1/10 of the funds (13%) are spent on health policies, systems, and products (i.e., health financing and social protection, health information, evidence and research policy, essential health technologies, health systems policies and service delivery, human resources for health, policy making for health, and essential medicines); and (4) about 1/10 of the funds (11%) are spent on the determinants of health (i.e., food safety, women and health, health and environment, health promotion, nutrition, violence prevention, injuries and disabilities, and communicable disease research).

Through its globally recognized functions, the WHO provides leadership on health matters worldwide, and it sets norms and standards on health issues. The WHO's organizational structure allows it to perform a major global role in shaping a health research agenda, articulating evidence-based policy options, and channeling technical support

to countries, as well as monitoring and assessing global health trends.

In the 21st century, the WHO performs a critical role in an effort to ensure that health becomes a genuinely shared responsibility, involving equitable access to essential healthcare and a collective defense against transnational threats to health. Traditionally, the WHO's collective knowledge expressed through officially supported research results has been the reference base for member states to establish regulatory measures.

The Concept of Health

In conformity with the Charter of the United Nations, the WHO constitution proposes that to attain basic happiness, harmonious relations, and security for all people in the world, the principles that determine health are essential. Thus, for the WHO, health is a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity.

Furthermore, WHO constituents affirm that the accomplishment of the highest possible standard of health is one of the fundamental rights of every human being regardless of race, religion, political belief, and economic or social condition. In addition, the health of all people is fundamental to the attainment of peace and security and depends on the fullest cooperation of individuals and countries. The WHO constitution states that the achievement of any country in the promotion and protection of health is of value to all and that unequal development in different countries in the promotion of health and control of disease, especially communicable disease, is a danger for all.

The WHO constituents also affirm that the healthy development of the child is of basic importance and that people's ability to live harmoniously in a changing total environment is essential to such development.

In addition, they affirm that the benefits of medical, psychological, and related knowledge are essential for the fullest attainment of health, but only if extended to all people, and that informed opinion and active cooperation on the part of the public are of utmost importance in the improvement of the health of the people.

The WHO constitution concludes that countries have a responsibility for the health of their people,

which can be fulfilled only by the provision of adequate health and social measures. All countries that become members of the WHO accept these principles for the purpose of cooperation among themselves and with others to promote and protect the health of all peoples.

World Health Assembly

All member states are represented in the World Health Assembly. Each member has one vote but may send three delegates. According to the WHO constitution, the delegates are to be chosen for their technical competence and preferably should represent national health administrations. Delegations may include alternates and advisers. The assembly meets annually, usually in May, for approximately 3 weeks. Most assemblies are held at WHO's headquarters in Geneva, Switzerland.

The World Health Assembly determines the policies of the organization and deals with budgetary and administrative questions. By a two-third vote, the assembly may adopt conventions or agreements. While these are not binding on member governments until accepted by them, the member state must take action leading to their acceptance within 18 months of their adoption, even if its delegation voted against a convention in the assembly, by submitting the convention to its legislature for ratification, and it must notify the WHO of the action taken. If the action is unsuccessful, it must notify the WHO of the reasons for nonacceptance.

In addition, the assembly has quasi-legislative powers to adopt regulations on important technical matters specified in the WHO constitution. Once the assembly adopts a regulation, it applies to all WHO member countries (including those whose delegates voted against it, except those whose governments specifically notify WHO that they reject the regulation or accept it only with certain reservations).

The WHO is empowered to introduce uniform technical regulations on the following matters: (a) sanitary and quarantine requirements and other procedures designed to prevent international epidemics; nomenclature with respect to disease, causes of death, and public health practices; (b) standards with respect to diagnostic procedures for international use; (c) standards with respect to

the safety, purity, and potency of biological, pharmaceutical, and similar products in international commerce; and (d) advertising and labeling of biological, pharmaceutical, and similar products in international commerce.

Current Role

Currently, the WHO fulfils its objectives through its core functions, which are (a) providing leadership on matters critical to health and engaging in partnerships where joint action is needed; (b) shaping the research agenda and stimulating the generation, translation, and dissemination of valuable knowledge; (c) setting norms and standards and promoting and monitoring their implementation; articulating ethical and evidence-based policy options; (d) providing technical support, catalyzing change, and building sustainable institutional capacity; and (e) monitoring the health situation and assessing health trends.

These core functions are set out in the 11th General Programme of Work, which provides the framework for the organization-wide program of work, its budget, resources, and results. Titled *Engaging for Health*, it covers the 10-year time period 2006–2015.

Scientific Conferences and the World Health Assembly

The WHO supports or sponsors numerous scientific conferences throughout the world. Each year, the World Health Assembly also sponsors a scientific conference on a specific topic of worldwide health interest. Discussions at this conference are held in addition to assembly business. They enable the delegates, who as a rule are top-ranking public health experts, to discuss common problems more thoroughly than formal committee debates would permit. Governments are asked to contribute special working papers and studies to these discussions and, if practicable, to send experts on the matters that are discussed.

Executive Board

The World Health Assembly may elect any 32 member countries to participate in the Executive

Board for 3-year terms as long as the representation complies with equitable geographic distribution. Each of the elected countries must designate one person “technically qualified in the field of health” as a member of the Executive Board. The countries are elected by rotation, one third of the membership being replaced every year, and members may succeed themselves. Board members serve as individuals and not as representatives of their governments.

The Executive Board meets twice a year for sessions of a few days to several weeks, but the board may convene a special meeting at any time. One of the board’s functions is to prepare the agenda for the World Health Assembly. The WHO constitution authorizes the board to take emergency measures within the functions and financial resources of the organization in order to deal with events requiring immediate action. In particular, it may authorize the Director-General to take the necessary steps to combat epidemics and to participate in the organization of health relief to victims of a calamity.

Structure and Areas of Work

Much of the WHO’s work is concentrated on supporting research and providing technical advice to governments. The WHO and its staff work and interact with ministries of health, health-related academia, research centers, the private healthcare sector, and pharmaceutical manufacturers.

The WHO’s staff consists of more than 8,000 health experts, including physicians, epidemiologists, scientists, managers, administrators, and other professionals. The staff provides services from the WHO’s global headquarters, located in Geneva, Switzerland, and six regional offices—namely, (1) WHO Regional Office for Africa (AFRO), located in Brazzaville, Republic of the Congo; (2) WHO Regional Office for the Americas (AMRO)/Pan American Health Organization (PAHO), located in Washington, D.C.; (3) WHO Regional Office for the Eastern Mediterranean (EMRO), located in Cairo, Egypt; (4) Regional Office for Europe (EURO), located in Copenhagen, Denmark; (5) WHO Regional Office for South-East Asia (SEARO), located in New Delhi, India; and (6) WHO Regional Office for the Western Pacific (WPRO), located in Manila, the Philippines.

In addition, the WHO has local offices located in 147 countries.

The WHO's organizational structure is very dynamic as it has to rapidly adapt to ever changing health conditions around the world. The WHO's regional offices and local country offices tend to follow changes in structure from the organization's headquarters, adapting them to the existing health situations and needs of their own geographical areas.

The WHO headquarters structure consists of the Director General's Office, which includes the Deputy Director General, the Executive Director, advisers, governing bodies, internal oversight services, legal counsel, communications, ombudsmen, official institutional links with other international structures and partnerships, operational links with regional offices, and a special unit for polio eradication. WHO's headquarters also includes

(a) organizational and operational structures for health security and environment; (b) HIV/AIDS, tuberculosis, malaria, and neglected tropical diseases; (c) health systems and services; health technology and pharmaceuticals; (d) health action in crises; information, evidence, and research; (e) family and community health; (f) noncommunicable diseases and mental health; and (g) general management.

Milestones in the History of the WHO

The WHO has continuously adapted to changes in scientific, medical advances and world healthcare needs. It has provided the background support for the improvement of health around the world, contributing either directly or indirectly to major achievements in health that include the following:

1948	The WHO takes on the responsibility of developing and implementing the International Classification of Diseases (ICD), which has become the standard clinical and epidemiological tool used worldwide.
1952	Jonas Salk in the United States develops the first successful polio vaccine.
1952–1964	The WHO/UNICEF Global Yaws Control Program reduces the prevalence of the crippling disease, yaws, from 50 million in 1950 to approximately 2.5 million cases in 1965.
1967	South African surgeon Christian Bernard succeeds in conducting the first heart transplant.
1967–1979	The WHO coordinates the smallpox eradication campaign, and for the first time in the history of humankind, a major infectious disease that killed millions is eradicated from the world.
1974	The World Health Assembly creates the Expanded Program for Immunization to bring basic vaccines to all children worldwide.
1974–2004	The WHO's Onchocerciasis Control Program prevents 600,000 cases of river blindness, and 18 million children are spared from the disease. And 25 million hectares of abandoned river land becomes productive again.
1977	The WHO publishes the first <i>Essential Medicines List</i> , providing countries with a national list of essential medicines.
1978	The WHO's International Conference on Primary Care in Alma-Ata, Kazakhstan, sets the historic goal of "Health for All."
1983	The Pasteur Institute in France identifies the human immunodeficiency virus (HIV), the causative agent of acquired immunodeficiency syndrome (AIDS).
1988	The WHO's Global Polio Eradication Initiative is established. As a result, 5 million children are prevented from suffering from disability, and 1.5 million childhood deaths are averted.
2003	Severe acute respiratory syndrome (SARS) is first identified and controlled.
2004	The WHO adopts the Global Strategy on Diet, Physical Activity and Health.
2005	The World Health Assembly revises the International Health Regulations.

In the near and distant future, the WHO will continue to promote and protect the health of all the peoples of the world.

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See also Comparing Health Systems; Health; International Classification for Patient Safety (ICPS); International Classification of Diseases (ICD); Pan American Health Organization (PAHO); Preventive Care; Public Health

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- Directory of the United Nations (UN): <http://www.unsystem.org>
- World Health Organization (WHO) Headquarters: <http://www.who.int>
- World Health Organization (WHO), Regional Office for Africa (AFRO): <http://www.afro.who.int>
- World Health Organization (WHO), Regional Office for Europe (EURO): <http://www.euro.who.int>
- World Health Organization (WHO), Regional Office for South-East Asia (SEARO): <http://www.searo.who.int>
- World Health Organization (WHO), Regional Office for the Americas (AMRO)/Pan-American Health Organization (PAHO): <http://www.paho.org>
- World Health Organization (WHO), Regional Office for the Eastern Mediterranean (EMRO): <http://www.emro.who.int/index.asp>
- World Health Organization (WHO), Regional Office for the Western Pacific (WPRO): <http://www.wpro.who.int>

Annotated Bibliography

This bibliography contains a list of core articles and books covering selected topics of health services research.

I. Health Services Research

1. General Works
2. Definitions, Scope, and Importance
3. History
4. Methods and Data

II. Access to Healthcare

5. General Works
6. Cultural Competency
7. Health Disparities
8. Inner-City Health
9. Rural Health
10. Safety Net
11. Uninsured Individuals
12. Vulnerable Populations

III. Costs, Economics, and Financing of Healthcare

13. General Works
14. Competition and Markets
15. Cost-Benefit and Cost-Effectiveness Analysis
16. Cost of Healthcare and Illness
17. Developing Countries
18. Healthcare Financial Management
19. International Comparisons
20. Payment Mechanisms
21. Supply and Demand

IV. Quality of Healthcare

22. General Works
23. Benchmarking and Comparative Data
24. Clinical Practice Guidelines and Disease Management
25. Decision Making and Clinical Support Systems
26. Evidence-Based Medicine (EBM)
27. Health Literacy and Communication
28. Health Report Cards
29. Medical Errors
30. Medical Malpractice
31. Medical Practice Variations
32. Pain Management
33. Patient-Centered Care

34. Patient Safety
35. Patient Satisfaction
36. Quality Management
37. Volume-Outcome Relationship

V. Organizational Behavior and Structure of Healthcare

38. General Works
39. Clinical Coordination, Integration of Care, and Continuum of Care
40. Managed Care
41. Organizational Theory and Behavior
42. Ownership

VI. Health Measurements, Methods, and Outcomes

43. General Works
44. Community-Based Participatory Research
45. Epidemiology
46. Geographic Information Systems (GIS)
47. Health Measurement Scales
48. Health Surveys
49. Informatics
50. Longitudinal Analysis
51. Meta-Analysis
52. Outcomes Research
53. Randomized Controlled Trials (RCT) and Research
54. Risk- and Case-Mix Adjustment
55. Small-Area Analysis
56. Statistical Process Control and Six Sigma Quality
57. Statistics

VII. Health Policy

58. General Works
59. Healthcare Reform
60. Health Insurance
61. Law and Ethics
62. Medicaid and the State Children's Health Insurance Program (SCHIP)
63. Medicare
64. National Health Insurance
65. Rationing Healthcare
66. Regulation

VIII. Health Professionals and Healthcare Organizations

67. General Works
68. Academic Medical Centers
69. Dentistry
70. Emergency Care and Intensive-Care Units
71. Healthcare Administration and Management
72. Hospitals
73. Nursing
74. Pharmacists and Pharmacy
75. Physicians
76. Prepaid Group Practice
77. Primary Care
78. Veterans Administration (VA)

IX. Public Health

79. General Works
80. Community and Population Health
81. Disaster Preparedness, Emergency Management, and Relief
82. Environmental Health
83. Evidence-Based Public Health
84. Global Health
85. Health Promotion and Disease Prevention
86. Maternal and Child Health

X. Selective Diseases and Conditions

87. Acute and Infectious Diseases
88. AIDS/HIV
89. Asthma
90. Cancer
91. Chronic Diseases
92. Diabetes
93. Emerging Diseases
94. Heart Disease
95. Hypertension

96. Iatrogenic Diseases and Nosocomial Infections
97. Injuries and Trauma
98. Stroke

XI. Mental Health and Behavioral Disorders

99. Alzheimer's Disease and Dementia
100. Depression
101. Mental Health
102. Obesity, Eating Disorders, and Nutrition
103. Substance Abuse
104. Tobacco Use

XII. Aging, Disability, and Long-Term Care

105. Aging and the Elderly
106. Assisted Living
107. Disability
108. End-of-Life Care
109. Home Healthcare
110. Nursing Homes and Long-Term Care

XIII. Other

111. Bioterrorism
112. E-Health and Telemedicine
113. Fraud and Abuse
114. Future Trends
115. Genetics
116. Health Planning
117. Physician–Patient Relationship
118. Privacy, Confidentiality, and the Health Insurance Portability and Accountability Act of 1996 (HIPAA)
119. Program Evaluation
120. Technology Assessment
121. Women's Health Issues

I. Health Services Research

Health services research is the emerging field that addresses the complex issues related to the healthcare system and informs health policy and practice. Health services research examines important issues such as access, costs, quality, and outcomes of healthcare.

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II. Access to Healthcare

Access to healthcare is the ability to establish contact with and use the healthcare system and its services. There are about 47 million uninsured individuals in the United States, many of whom are unable to afford health insurance coverage and thus are unable to access the healthcare system.

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III. Costs, Economics, and Financing of Healthcare

Costs, economics, and financing of healthcare refer to the expenditures, scarcity in the allocation of healthcare resources, and the way healthcare is paid for. Economic principles are a useful tool to better understand how to control rising healthcare costs and how to finance healthcare.

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VII. Health Policy

Health policy is the stance of the government that is aimed at improving health and healthcare. Many researchers, organizations, and advocacy groups work to shape health policy by using evidence-based studies and various resources to aid in policy guidance.

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VIII. Health Professionals and Healthcare Organizations

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XI. Mental Health and Behavioral Disorders

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XII. Aging, Disability, and Long-Term Care

Aging is the process of getting older, and it is concerned with issues of the elderly. Disability is the lack of ability as compared with a normal group of individuals. Long-term care is the care that is provided to the chronically ill and the disabled.

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XIII. Other

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Appendix: Web Resources

This listing contains useful resources that are available on the Internet for selected topics of health services research. It contains a brief description of each topic and links to Web sites based on particular categories of interest. These links are current as of the publication date.

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1. Academic Medical Centers

Academic medical centers are teaching hospitals that are generally affiliated with a medical school or university. These hospitals have a broad mission that includes teaching, clinical research, and medical education, and they may offer the latest advancements in medical technologies and treatments.

Alliance of Independent Academic Medical Centers (AIAMC) <http://www.aiamc.org>

Association of Academic Health Centers <http://www.ahcnet.org>

Association of Canadian Academic Healthcare Organizations (ACAHO) <http://www.achao.org>

University HealthSystem Consortium (UHC) <http://www.uhc.edu>

See also Hospitals; Medical Residents and Interns; Physicians

2. Accreditation, Certification, and Licensing

Accreditation, certification, and licensing are ways of credentialing healthcare providers and facilities to ensure that a minimum professional standard has been met. Several private organizations carry out credentialing activities in healthcare.

Accreditation Association for Ambulatory Health Care (AAAHC) <http://www.aaahc.org>

Accreditation Canada, formerly known as the Canadian Council on Health Services Accreditation <http://www.accreditation-canada.ca>

American Board of Medical Specialties (ABMS) <http://www.abms.org>

Association of American Medical Colleges (AAMC) <http://www.aamc.org>

Association of Faculties of Medicine of Canada (AFMC) <http://www.afmc.ca>

Commission on Accreditation of Rehabilitation Facilities (CARF) <http://www.carf.org>

Commission on Dental Accreditation of Canada <http://www.cda-adc.ca/cdacweb>

Commission on Osteopathic College Accreditation (COCA), American Osteopathic Association <http://www.osteopathic.org>

Council on Accreditation (COA) <http://www.coanet.org>

Federation of State Medical Boards of the United States (FSMB) <http://www.fsmb.org>

Healthcare Facilities Accreditation Program (HFAP), American Osteopathic Association https://www.do-online.org/index.cfm?au=D&PageId=edu_main&SubPageId=acc_main

Joint Commission <http://www.jointcommission.org>

National Committee for Quality Assurance (NCQA) <http://www.ncqa.org>

Royal College of Dentists of Canada (RCDC) <http://www.rcdc.ca>

Utilization Review Accreditation Committee (URAC) <http://www.urac.org>

See also Health Law; Hospitals; Public Health; Quality of Healthcare; Regulation

3. Adult Day Care

Adult day care is provided at facilities that care for the elderly and/or disabled. Health and social services may also be provided at these facilities.

National Adult Day Services Association (NADSA) <http://www.nadsa.org>

See also Aging; Disability; Assisted Living; Gerontology; Nursing Homes

4. Advocacy, Education, and Research Organizations

Advocacy, education, and research organizations are engaged in and inform the public policy debate on relevant health policy issues. These organizations play an important role in educating and raising awareness of the public and policymakers on timely and key issues affecting the healthcare system.

Abt Associates <http://www.abtassociates.com>

AcademyHealth <http://www.academyhealth.org>

Alliance for Health Reform <http://www.allhealth.org>

American Enterprise Institute for Public Policy Research (AEI) <http://www.aei.org>

Brookings Institution <http://www.brookings.edu>

Caledon Institute of Social Policy (Canada) <http://www.caledoninst.org>

Canadian Centre for Policy Alternatives <http://www.policyalternatives.ca>

Canadian Council on Social Development (CCSD) <http://www.ccsd.ca>

Cato Institute <http://www.cato.org>

Center for Budget and Policy Priorities <http://www.cbpp.org>

Center for Health Care Strategies, Inc. (CHCS) <http://www.chcs.org>

Center for Studying Health System Change (HSC)
<http://www.hschange.com>

Employee Benefit Research Institute (EBRI)
<http://www.ebri.org>

Families USA <http://www.familiesusa.org>

Galen Institute <http://www.galen.org>

Health Affairs <http://www.healthaffairs.org>

Heritage Foundation <http://www.heritage.org>

Institute of Medicine (IOM), National Academy of Sciences <http://www.iom.edu>

Kaiser Family Foundation <http://www.kaisernetwork.org>

Lewin Group <http://www.lewin.com>

Mathematica Policy Research, Inc.
<http://www.mathematica-mpr.com>

MEDTAP International <http://www.medtap.com>

National Academy of Social Insurance (NASI)
<http://www.nasi.org>

National Institute for Health Care Management (NIHCM) <http://www.nihcm.org>

Policy Action Network <http://www.movingideas.org>

Public Citizen <http://www.citizen.org>

RAND Corporation <http://www.rand.org>

Research Triangle Institute International (RTI) <http://www.rti.org>

Urban Institute <http://www.urban.org>

See also Federal Government; Foundations and Philanthropies; Health Policy Organizations

5. African American Health

African American health recognizes the unique health-care needs and health disparities of this minority racial group. Several organizations are focused on the particular health needs of African Americans.

African American Family Services (AAFS) <http://www.aafs.net>

African-American Health, Medline Plus, National Library of Medicine (NLM) <http://www.nlm.nih.gov/medlineplus/africanamericanhealth.html>

American Sickle Cell Anemia Association (ASCAA)
<http://www.ascaa.org>

Black AIDS Institute <http://www.blackaids.org>

National Black Alcoholism and Addictions Council
<http://www.nbacinc.org>

Waltham Forest Black People's Mental Health Association <http://www.bpmha.orgmenu.htm>

See also AIDS/HIV; Health Disparities; Minority Health; Public Health

6. Aging

A number of organizations are dedicated to promoting the health and welfare of the elderly and aging. As the population continues to grow older with life expectancy increasing, these organizations will continue to serve an important role in our communities.

AARP (formerly the American Association of Retired Persons) <http://www.aarp.org>

Administration on Aging (AOA) <http://www.aoa.gov>

Alliance for Aging Research (AAR)
<http://www.agingresearch.org>

American Association of Homes and Services for the Aging (AAHSA) <http://www.aahsa.org>

American Federation for Aging Research (AFAR)
<http://www.afar.org>

American Health Assistance Foundation (AHAF)
<http://www.ahaf.org>

American Society on Aging (ASA) <http://www.asaging.org>

Center for Healthy Aging
<http://www.centerforhealthyaging.org>

Centre on Aging (Canada)
<http://www.umanitoba.ca/centres/aging>

Centre on Aging, University of Victoria, Canada
<http://www.coag.uvic.ca>

European Federation of Older Persons (EURAG)
<http://www.eurageurope.org>

Institute for the Future of Aging Services (IFAS)
<http://www.futureofaging.org>

International Institute on Ageing, United Nations (UN)
<http://www.inia.org.mt>

National Aging Information and Referral Support Center
<http://www.nasua.org/informationandreferral>

National Associations of Area Agencies on Aging (n4a) (members are Area Agencies on Aging, established under the provisions of the Older Americans Act of 1965)
<http://www.n4a.org>

National Association of County Aging Programs (NACAP) <http://www.naco.org>

National Association of State Units on Aging (NASUA)
<http://www.nasua.org>

National Caucus and Center on Black Aged (NCBA)
<http://www.ncba-aged.org>

National Council on the Aging (NCOA) <http://www.ncoa.org>

National Eldercare Locator <http://www.eldercare.gov>

National Hispanic Council on Aging (NHCOA)
<http://www.nhcoa.org>

National Institute on Aging (NIA), U.S. National Institutes of Health <http://www.nia.nih.gov>

National Program on Women and Aging, The Heller School of Social Policy and Management, Brandeis University, Waltham, MA <http://iasp.brandeis.edu/womenandaging>

National Resource Center on Nutrition, Physical Activity & Aging, Florida International University, Miami, FL
<http://nutritionandaging.fiu.edu>

RAND Center for the Study of Aging
<http://www.rand.org/labor/aging>

Resource Center on Aging, University of California, Berkeley, CA <http://socrates.berkeley.edu/~aging>

Retirement Research Foundation (RRF) <http://www.rrf.org>

See also Assisted Living; Disability; Gerontology; Nursing Homes

7. AIDS/HIV

AIDS/HIV cases continue to be reported each year with those residing in resource poor settings and with minority groups being disproportionately burdened. As people with AIDS/HIV live longer with better treatment options available, the quality of life of these individuals remains a concern.

AIDS Alliance for Children, Youth and Families
<http://www.aids-alliance.org>

AIDS Clinical Trials Group (ACTG) <http://www.aactg.org>

AIDS Resource Foundation for Children (ARFC)
<http://www.aidsresource.org>

American Foundation for AIDS Research (amfAR)
<http://www.amfar.org>

Association of Nurses in AIDS Care (ANAC)
<http://www.anacnet.org>

Black AIDS Institute <http://www.blackaids.org>

Body Positive <http://www.thebody.com/bp/bp.html>

Canadian HIV/AIDS Information Centre
<http://www.aidsida.cpha.ca>

Elizabeth Glaser Pediatric AIDS Foundation
<http://www.pedaids.org>

Gay Men's Health Crisis (GMHC) <http://www.gmhc.org>

Global AIDS Alliance (GAA)
<http://www.globalaidsalliance.org>

HIV/AIDS Program, World Health Organization
<http://www.who.int/hiv/en>

HIV Medicine Association (HIVMA) <http://www.hivma.org>

National AIDS Fund <http://www.aidsfund.org>

National AIDS Treatment Advocacy Program (NATAP)
<http://www.natap.org>

National Association of People with AIDS (NAPWA)
<http://www.napwa.org>

National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention (NCHHSTP) <http://www.cdc.gov/nchhstp>

National Minority AIDS Council (NMAC)
<http://www.nmac.org>

Student Global AIDS Campaign (SGAC)
<http://www.fightglobalaids.org>

See also Epidemiology; Minority Health; Public Health

8. Alcoholism

Alcoholism is a serious condition where individuals persistently use alcohol to the detriment of their health. The abuse of alcohol results in negative health consequences that can have lasting effects.

Alcohol and Drug Problems Association of North America (ADPA) <http://www.adpana.com>

Alcoholics Anonymous World Service (AA) <http://www.aa.org>

Century Council <http://www.centurycouncil.org>

Drug and Alcohol Testing Industry Association (DITIA)
<http://www.datia.org>

National Association of State Alcohol and Drug Abuse Directors (NASADAD) <http://www.nasadad.org>

National Black Alcoholism and Addictions Council
<http://www.nbacinc.org>

National Institute on Alcohol Abuse and Alcoholism (NIAAA) <http://www.niaaa.nih.gov>

SAMHSA's National Clearinghouse for Alcohol and Drug Information <http://www.health.org>

See also Federal Government; Public Health; Substance Abuse

9. Allied Health

Allied health represents the group of healthcare professionals outside the realm of medicine and nursing. These professionals work together with other healthcare providers to make up the healthcare team and to help ensure the proper functioning of the healthcare system.

American Occupational Therapy Association (AOTA)
<http://www.aota.org>

American Physical Therapy Association (APTA)
<http://www.apta.org>

Canadian Association of Occupational Therapists (CAOT) <http://www.caot.ca>

Canadian Physiotherapy Association
<http://www.physiotherapy.ca>

National Rehabilitation Association
<http://www.nationalrehab.org>

See also Case Management; Medical Technologists

10. Alzheimer's Disease

Alzheimer's disease is the most common form of dementia and it is an incurable and terminal condition. Several organizations have led efforts to promote research and care for those afflicted with this degenerative disease.

Alzheimer's Association (ALZ) <http://www.alz.org>

Alzheimer's Disease Education and Referral (ADEAR) Center <http://www.nia.nih.gov/alzheimers>

Alzheimer Society of Canada <http://www.alzheimer.ca>

National Institute on Aging (NIA) <http://www.nia.nih.gov>

See also Aging; Disability; Gerontology; Nursing Homes

11. Ambulatory Care

Ambulatory care is medical care that is provided on an outpatient basis. Ambulatory care can be delivered in doctor's offices and clinics, emergency departments, and urgent care centers.

Academic Pediatric Association, formerly known as the Ambulatory Pediatric Association <http://www.ambpeds.org>

Accreditation Association for Ambulatory Health Care (AAAHC) <http://www.aaahc.org>

See also Ambulatory Surgery Centers; Community Health Centers (CHCs); Physicians

12. Ambulatory Surgery Centers

Ambulatory surgery centers are healthcare facilities that provide same-day surgeries on an outpatient basis that do not require a patient to be hospitalized.

American Association for Accreditation of Ambulatory Surgery Facilities (AAAASF) <http://www.aaaasf.org>

American Association of Ambulatory Surgery Centers (AAASC) <http://www.aaasc.org>

See also Ambulatory Care; Surgery and Surgeons

13. Anesthesiology

Anesthesiology is a medical speciality that focuses on administering anesthesia to patients and monitoring vital bodily functions during a medical procedure such as surgery.

American Society of Anesthesiologists (ASA)
<http://www.asahq.org>

American Society of Regional Anesthesia and Pain Medicine (ASRA) <http://www.asra.org>

Society of Cardiovascular Anesthesiologists (SCA)
<http://www.scahq.org>

See also Ambulatory Surgery Centers; Dentistry; Hospitals; Surgery and Surgeons

14. Antitrust

Antitrust is an area that promotes competition in healthcare to benefit consumers. At its core, competition serves to improve healthcare quality, reduce costs, and increase access.

American Antitrust Institute <http://www.antitrustinstitute.org>

Antitrust Coalition for Consumer Choices in Health Care <http://www.healthantitrust.org>

Health Care Antitrust Division, U.S. Department of Justice
http://www.usdoj.gov/atr/public/health_care/health_care.htm

U.S. Federal Trade Commission (FTC) <http://www.ftc.gov/bc>

See also Ethics; Health Law; Regulation

15. Arthritis and Rheumatism

Arthritis and rheumatism are common diseases of the bones and joints. These difficult to treat conditions afflict many individuals each year and cause chronic pain.

American College of Rheumatology (ACR)
<http://www.rheumatology.org>

Arthritis Foundation <http://www.arthritis.org>

Arthritis Society (Canada) <http://www.arthritis.ca>

National Institute of Arthritis and Musculoskeletal and Skin
 Diseases (NIAMS) <http://www.niams.nih.gov>

See also Epidemiology; Public Health; Women's Health Issues

16. Assisted Living

Assisted living facilities provide assistance with activities of daily living to individuals and may also assist with personal care and medical supervision.

Consumer Consortium on Assisted Living (CCAL)
<http://www.ccal.org>

See also Adult Day Care; Aging; Disability

17. Asthma

Asthma is a condition in which the airways of the lungs become blocked or narrowed and results in breathing difficulties. Several organizations are dedicated to education, research, and advocacy efforts for those suffering from asthma.

American Academy of Allergy, Asthma, and Immunology
 (AAAAI) <http://www.aaaai.org>

American College of Allergy, Asthma and Immunology
 (ACAAI) <http://www.acaai.org>

Asthma and Allergy Foundation of America (AAFA)
<http://www.aafawa.org>

Asthma Society of Canada <http://www.asthma.ca>

Food Allergy and Anaphylaxis Network
<http://www.foodallergy.org>

National Institute of Allergy and Infectious Diseases
 (NIAID) <http://www3.niaid.nih.gov>

World Allergy Organization (WAO)
<http://www.worldallergy.org>

See also Chronic Diseases; Environmental Health; Public Health; Tobacco Use

18. Bioterrorism

Bioterrorism is the use of biological, chemical, and other agents as a deliberate means of coercion or

intimidation to further an ideology without regard for the well-being of others.

Coordinating Office for Terrorism Preparedness and Emergency
 Response, Centers for Disease Control and Prevention
 (CDC) <http://www.cdc.gov/maso/pdf/COTPERfs.pdf>

U.S. Department of Homeland Security (DHS)
<http://www.dhs.gov>

See also Disaster Preparedness and Relief; Federal Government; Public Health

19. Birth Defects

Birth defects are the malformation and abnormalities in a developing fetus that can be caused by a variety of sources, including genetics and the environment.

March of Dimes Birth Defects Foundation (MDBDF)
<http://www.marchofdimes.com>

National Birth Defects Prevention Network (NBDPN)
<http://www.nbdpn.org>

National Center on Birth Defects and Developmental
 Disabilities (NCBDDD) <http://www.cdc.gov/ncbddd>

National Institute of Child Health and Human Development
 (NICHD) <http://www.nichd.nih.gov>

See also Child Development and Health; Environmental Health; Genetics; Public Health

20. Blind and Visually Impaired

Blind and visually impaired refers to the condition of having vision loss. More than 10 million individuals in North America are considered to have some visual impairment.

American Council of the Blind (ACB) <http://www.acb.org>

American Foundation for the Blind (AFB) <http://www.afb.org>

American Printing House for the Blind (APH)
<http://www.aph.org>

Blind Veterans Association (BVA) <http://www.bva.org>

Canadian National Institute for the Blind (CNIB)
<http://www.cnib.ca>

Foundation Fighting Blindness (FFB)
<http://www.fightblindness.org>

Guide Dog Foundation for the Blind (GDFB)
<http://www.guidedog.org>

Guide Dogs of America (GDA)
<http://www.guidedogsofamerica.org>

Helen Keller International (HKI) <http://www.hki.org>
 Leader Dogs for the Blind (LDB) <http://www.leaderdog.org>
 National Consortium on Deaf-Blindness
<http://www.nationaldb.org>
 National Federation of the Blind (NFB) <http://www.nfb.org>
 National Library Service for the Blind and Physically
 Handicapped <http://www.loc.gov/nls>
 Prevent Blindness America
<http://www.preventblindness.org>
 Recording for the Blind and Dyslexic (RFB&D)
<http://www.rfbd.org>
 Research to Prevent Blindness (RPB) <http://www.rpbusa.org>
 The Seeing Eye <http://www.seeingeye.org>
See also Disability; Eye Diseases; Ophthalmology; Optometry

21. Blood and Blood Banks

Blood is a bodily fluid that is necessary to sustain life and provide cells with needed substances. Blood banks are centers that receive and store blood from donors to be later used for patients in need of blood transfusions.

American Association of Blood Banks (AABB)
<http://www.aabb.org>
 American Red Cross <http://www.redcross.org>
 America's Blood Centers <http://www.americasblood.org>
 Canadian Blood Services <http://www.bloodservices.ca>
 H me Qu bec (Canada) <http://www.hema-quebec.qc.ca/anglais>

See also Blood Disorders; Donors and Organ Transplantation

22. Blood Disorders

Blood disorders are conditions that affect blood and its components. Blood disorders may affect blood proteins, blood cells, hemoglobin, or coagulation.

Center for International Blood and Marrow Transplant
 Research (CIBMTR) <http://www.cibmtr.org>
 National Heart, Lung, and Blood Institute (NHLBI)
<http://www.nhlbi.nih.gov>
 National Hemophilia Foundation
<http://www.hemophilia.org>

See also Blood and Blood Banks; Genetics; Rare Diseases

23. Burn Care

Burn care is the specialized medical care that is given to patients who suffer from serious burns.

American Burn Association (ABA) <http://www.ameriburn.org>

See also Cosmetic and Plastic Surgery; Emergency Medicine; Injury

24. Business Coalitions on Health

Business coalitions on health are organizations that represent a group of businesses from both public and private sectors and their interests in healthcare.

National Organizations

Leapfrog Group, Washington, DC
<http://www.leapfroggroup.org>

National Business Coalition on Health (NBCH), Washington,
 DC <http://www.nbch.org>

Regional and Local Organizations

Alabama

Employers Coalition for Healthcare Options, Inc., Huntsville,
 AL <http://www.echoal.com>

Arizona

Southwest Health Alliance, Scottsdale, AZ
<http://www.southwesthealthalliance.org>

Arkansas

Employers' Health Coalition, Fort Smith, AR
<http://www.ehcark.org>

California

Pacific Business Group on Health, San Francisco, CA
<http://www.pbgh.org>

Colorado

Colorado Business Group on Health, Denver, CO
<http://www.coloradohealthonline.com>

Florida

Employers Health Coalition, Tampa, FL
<http://www.ehccaccess.org>

Florida Health Care Coalition, Orlando, FL
<http://www.flhcc.com>

Georgia

Savannah Business Group on Health, Savannah, GA
<http://www.savannahbusinessgroup.com>

Hawa'i

Hawa'i Business Health Council, Honolulu, HI
<http://www.hbhc.biz/index.html>

Illinois

Employer's Coalition on Health, Rockford, IL
<http://www.ecoh.com>

Heartland Healthcare Coalition, Morton, IL
<http://www.hhco.org>

Midwest Business Group on Health, Chicago, IL
<http://www.mbg.org>

Tri-State Health Care Coalition, Quincy, IL
<http://www.tri-statehealthcare.com>

Indiana

Indiana Employers Quality Health Alliance,
Indianapolis, IN <http://www.qualityhealthalliance.org>

Tri-State Business Group on Health, Newburgh, IN
<http://www.tsbg.evansville.net>

Kentucky

Four Rivers Health Care Purchasing Alliance, Inc., Calvert City,
KY <http://www.fourrivershc.com>

Louisiana

Louisiana Business Group on Health, Baton Rouge, LA
<http://www.lbgh.org>

Maine

Maine Health Management Coalition, Scarborough,
ME <http://www.mhmc.info>

Maryland

Mid-Atlantic Business Group on Health, Greenbelt,
MD <http://mabgh.org>

Massachusetts

Massachusetts Healthcare Purchaser Group, Boston,
MA <http://www.mhpg.org>

Michigan

AFL-CIO Employer Purchasing Coalition, Bloomfield,
MI http://www.nlahcc.org/members/afl_cio_.html

Alliance for Health, Grand Rapids, MI <http://www.afh.org>

Greater Detroit Area Health Council, Detroit, MI
<http://www.gdahc.org>

Michigan Purchasers Health Alliance, Ann Arbor, MI
<http://www.michpha.org>

REAL Health Association, Grand Rapids, MI
<http://www.realhealth.org>

Minnesota

Buyers Health Care Action Group, Bloomington, MN
<http://www.bhcag.com>

Missouri

Mid-America Coalition on Health Care, Kansas
City, MO <http://www.machc.org>

Missouri Consolidated Health Care Plan, Jefferson
City, MO <http://www.mchcp.org>

St. Louis Area Business Health Coalition, St. Louis,
MO <http://www.stlbhc.org>

Montana

Montana Association of Health Care Purchasers, Missoula,
MT <http://www.mahcp.info>

Nevada

Nevada Health Care Coalition, Reno, NV
<http://www.nhccreno.org>

New Jersey

The Health Care Payers Coalition of New Jersey,
Edison, NJ <http://www.hcpc.org>

New York

New York Business Group on Health, New York, NY
<http://www.nybgh.org>

Niagara Health Quality Coalition, Buffalo, NY
<http://www.nhq.com>

North Carolina

Piedmont Health Coalition, Inc., Burlington, NC
<http://www.piedmonthhealthcoalition.org>

WNC Health Coalition, Inc., Asheville, NC <http://wnchc.org>

Ohio

Employer Health Care Alliance, Cincinnati, OH
<http://www.cintiehca.com>

Employers Health Purchasing Corporation of Ohio, Canton,
OH <http://www.ehpco.com>

Franklin County Cooperative Health Benefits Program,
Columbus, OH <http://www.eelect.com>

Front Path Health Coalition, Maumee, OH
<http://www.frontpathcoalition.com>
 Health Action Council of Northeast Ohio, Cleveland,
 OH <http://www.healthactioncouncil.org>
 Tri-River Employers Healthcare Coalition, Dayton, OH
<http://www.tri-river.org>

Oregon

Oregon Coalition of Health Care Purchasers, Portland,
 OR <http://www.ochcp.org>

Pennsylvania

Lancaster County Business Group on Health,
 Lancaster, PA <http://www.lcbgh.org>
 Northeast Pennsylvania Regional Healthcare Coalition, Inc.,
 Orwigsburg, PA <http://www.nprhcc.com>
 Pittsburgh Business Group on Health, Ambridge, PA
<http://www.pbghpa.com>

Tennessee

Healthcare 21 Business Coalition of East and Middle
 Tennessee, Knoxville, TN <http://www.hc21.org>
 Memphis Business Group on Health, Memphis, TN
<http://www.memphisbusinessgroup.org>

Texas

Dallas/Fort Worth Business Group on Health, Dallas,
 TX <http://www.dfwbgh.org>

Virginia

Virginia Business Coalition on Health, Virginia Beach,
 VA <http://www.myVBCH.org>

Washington

Puget Sound Health Alliance, Seattle, WA
<http://www.pugetsoundhealthalliance.org>

Wisconsin

The Alliance (WI), Madison, WI
<http://www.alliancehealthcoop.com>
 Business Health Care Group of South East Wisconsin, Franklin,
 WI <http://www.bhcgsw.org>
 Employers Health Cooperative, Janesville, WI
<http://www.ehchealth.com>
 Fond Du Lac Area Businesses on Health, Fond
 Du Lac, WI <http://www.faboh.com>
 Greater Milwaukee Business Foundation on Health, Inc.,
 Sussex, WI <http://www.gmbfh.org>

See also Health Insurance; Prevention and Health Promotion

25. Canadian Healthcare Organizations

Canadian healthcare organizations are organizations that are dedicated to the health and healthcare system of Canada.

Association of Canadian Academic Healthcare Organizations
 (ACAHO) <http://www.acao.org>

Association of Faculties of Medicine of Canada
<http://www.afmc.ca>

Canada's Health Informatics Association (COACH)
<http://www.coachorg.com>

Canadian Association of Blue Cross Plans (CABCF)
<http://www.bluecross.ca>

Canadian Association for Health Services and Policy Research
 (CAHSPR) <http://www.cahspr.ca>

Canadian Association on Gerontology <http://www.cagacg.ca>

Canadian Generic Pharmaceutical Association (CGPA)
<http://www.cdma-acfpp.org>

Canadian Healthcare Association (CHA) <http://www.cha.ca>

Canadian Health Economics Research Association
 (CHERA) <http://www.chera.ca>

Canadian Health Services Research Foundation
 (CHSRF) <http://www.chsrf.ca>

Canadian Home Care Association (CHCA)
<http://www.cdnhomecare.ca>

Canadian Institutes of Health Research (CIHR)
<http://www.cihr.ca>

Canadian Medical Association (CMA) <http://www.cma.ca>

Canadian Pain Society (CPS)
<http://www.canadianpainsociety.ca>

Canadian Public Health Association (CPHA)
<http://www.cpha.ca>

Canadian Women's Health Network (CWHN)
<http://www.cwhn.ca>

Chronic Pain Association of Canada (CPAC)
<http://www.chronicpaincanada.com>

Health Canada <http://www.hc-sc.gc.ca>

Institute of Health Services and Policy Research (IHSPR),
 Canadian Institutes of Health Research (CIHR)
<http://www.cihr.cae/13948.html>

Public Health Agency of Canada, Injury
<http://www.phacaspc.gc.ca/injury-bles>

See also International Health Systems; National Health Insurance; World Health Organization (WHO)

26. Cancer

Cancer is a class of disease where the body's cells undergo uncontrolled growth, invade other tissues, and spread to other parts of the body. Cancer can occur at all ages but it predominantly affects individuals as they grow older. Cancer can be caused by genetics, behavioral, and/or environmental factors.

- American Association for Cancer Research (AACR)
<http://www.aacr.org>
- American Cancer Society (ACS) <http://www.cancer.org>
- American Foundation for Cancer Research (NFCR)
<http://www.nfcr.org>
- American Institute for Cancer Research (AICR)
<http://www.aicr.org>
- Association of Cancer Online Resources (ACOR)
<http://www.acor.org/about/about.html>
- Association of Community Cancer Centers (ACCC)
<http://www.accc-cancer.org>
- Breast Cancer Network of Strength
<http://www.networkofstrength.org>
- Canadian Cancer Society <http://www.cancer.ca>
- Cancer Care (CC) <http://www.cancercare.org>
- Cancer Information Service (CIS) <http://cis.nci.nih.gov>
- Coalition of Cancer Cooperative Groups
<http://www.cancertrialshelp.org>
- Damon Runyon Cancer Research Foundation
<http://www.cancerresearchfund.org>
- Leukemia and Lymphoma Society <http://www.lls.org>
- Lymphoma Research Foundation <http://www.lymphoma.org>
- National Breast Cancer Coalition (NBCC)
<http://www.stopbreastcancer.org>
- National Cancer Institute (NCI) <http://www.cancer.gov>
- National Coalition for Cancer Survivorship (NCCS)
<http://www.canceradvocacy.org>
- OncoLink, Abramson Cancer Center of the University of Pennsylvania <http://www.oncolink.com>
- Skin Cancer Foundation (SCF) <http://www.skincancer.org>
- Susan G. Komen for the Cure (SGKF)
<http://www.komen.org>
- Your Disease Risk, Siteman Cancer Center Prevention
<http://www.yourdiseaserisk.wustl.edu>

See also Oncology; National Institutes of Health (NIH); Public Health; Tobacco Use

27. Cardiology

Cardiology is the field of medicine that studies the heart and blood vessels.

- American Association of Cardiovascular and Pulmonary Rehabilitation (AACVPR) <http://www.aacvpr.org>
- American College of Cardiology (ACC) <http://www.acc.org>
- American College of Chest Physicians (ACCP)
<http://www.chestnet.org>
- American Society of Echocardiography (ASE)
<http://www.asecho.org>
- American Society of Nuclear Cardiology (ASNC)
<http://www.asnc.org>
- National Heart, Lung, and Blood Institute (NHLBI)
<http://www.nhlbi.nih.gov>

See also Epidemiology; Heart Disease; Public Health

28. Care Giving

Care giving is done by family or unpaid friends or relatives of who provide care and support to an individual with a disabling condition.

- Family Caregiver Alliance <http://www.caregiver.org>
- National Family Caregivers Association (NFCA)
<http://www.nfcacares.org>

See also Aging; Assisted Living; Disability; Nursing Homes

29. Case Management

Case management is a service that is provided to meet the healthcare needs of a patient and it is designed to produce cost-effective outcomes.

- Case Management Society of America (CMSA)
<http://www.cmsa.org>
- Commission for Case Manager Certification (CCMC)
<http://www.ccmcertification.org>

See also Allied Health; Care Giving; Chronic Diseases; Disability

30. Centers for Disease Control and Prevention (CDC)

The Centers for Disease Control and Prevention (CDC) is a public health agency of the federal government that works to protect the health and safety of all Americans.

The CDC is based in Atlanta, Georgia, and focuses its efforts on disease prevention and control.

Centers for Disease Control and Prevention (CDC)
<http://www.cdc.gov>

Director

Office of the Director <http://www.cdc.gov/about/director.htm>

Coordinating Centers for Environmental Health and Injury Prevention

Agency for Toxic Substances and Disease Registry (ATSDR) <http://www.atsdr.cdc.gov>

National Center for Environmental Health (NCEH)
<http://www.cdc.gov/nceh>

National Center for Injury Prevention and Control (NCIPC) <http://www.cdc.gov/ncipc>

Coordinating Centers for Health Information and Service

National Center for Health Statistics (NCHS)
<http://www.cdc.gov/nchs>

National Center for Health Marketing (NCHM)
<http://www.cdc.gov/healthmarketing>

National Center for Public Health Informatics (NCPHI)
<http://www.cdc.gov/ncphi>

Coordinating Center for Health Promotion

National Center for Chronic Disease Prevention and Health Promotion (NCCDPHP) <http://www.cdc.gov/nccdphp>

National Center on Birth Defects and Developmental Disabilities (NCBDDD) <http://www.cdc.gov/ncbddd>

Office of Genomics and Disease Prevention
<http://www.cdc.gov/genomics>

Coordinating Centers for Infectious Diseases

National Center for HIV, Viral Hepatitis, STD, and TB Prevention (NCHHSTP) <http://www.cdc.gov/nchhstp>

National Immunization Program (NIP)
<http://www.cdc.gov/nip>

Other

Coordinating Office for Global Health
<http://www.cdc.gov/cogh>

Coordinating Office for Terrorism Preparedness and Emergency Response <http://www.bt.cdc.gov>

National Institute for Occupational Safety and Health (NIOSH) <http://www.cdc.gov/niosh/homepage.html>

See also Emerging Diseases: Epidemiology; Health Surveys; Public Health; World Health Organization (WHO)

31. Centers for Medicare and Medicaid Services (CMS)

The Centers for Medicare and Medicaid Services (CMS) is the federal agency that is responsible for administering the Medicare, Medicaid, and State Children's Health Insurance Program (SCHIP). CMS works to ensure that its beneficiaries are provided with effective and quality healthcare.

Centers for Medicare and Medicaid Services (CMS)
<http://www.cms.gov>

Health Insurance Portability and Accountability Act of 1996 (HIPAA) <http://cms.hhs.gov/hipaa>

Medicaid <http://cms.hhs.gov/medicaid>

Medicare <http://cms.hhs.gov/medicare>

State Children's Health Insurance Program (SCHIP)
<http://cms.hhs.gov/schip>

See also Medicaid; Medicare; State Children's Health Insurance Program (SCHIP)

32. Certificate of Need (CON)

Certificate of need is a program that works to control healthcare facility costs through the coordinated planning of services and new construction projects.

American Association of Health Plans (AAHP) (The AAHP publishes an annual directory of state certificate of need programs) <http://www.aahp.org>

See also Health Law; Health Planning; Regulation

33. Childbirth

Childbirth is the process of giving birth to a newborn infant.

Lamaze International <http://www.lamaze.org>

Maternity Center Association (MCA)
<http://www.maternitywise.org>

National Association of Birth Centers (NACC)
<http://www.birthcenters.org>

See also Birth Defects; Child Development and Health;
Obstetrics and Gynecology

34. Child Development and Health

Child development refers to the physiological and psychological changes that occur as a child grows older. Child health refers to the unique health needs of children.

Ambulatory Pediatric Association (APA)
<http://www.ambpeds.org>

American Academy of Child and Adolescent Psychiatry
(AACAP) <http://www.aacap.org>

American Academy of Pediatrics (AAP) <http://www.aap.org>

American Pediatric Surgical Association (APSA)
<http://www.eapsa.org>

American Public Human Services Association (APHSA)
<http://www.aphsa.org>

Association of Maternal and Child Health Programs
(AMCHP) <http://www.amchp.org>

Children's Defense Fund (CDF)
<http://www.childrensdefense.org>

Children's Health Fund (CHF)
<http://www.childrenshealthfund.org>

Children's Organ Transplant Association (COTA)
<http://www.cota.org>

Institute for Child Health Policy (ICHP), University of
Florida <http://www.ichp.ufl.edu>

Maternal and Child Health Bureau, Health Resources and
Services Administration (HRSA) <http://mchb.hrsa.gov>

Maternal and Child Health Library
<http://www.mchb.hrsa.gov/mchirc>

Maternal and Child Health Policy Research Center,
Washington, DC <http://www.mchpolicy.org>

National Association of Children's Hospitals and Related
Institutions (NACHRI) <http://www.childrenshospitals.net>

National Child Care Information Center <http://nccic.org>

National Healthy Mothers, Healthy Babies Coalition
<http://www.hmhb.org>

National Initiative for Children's Healthcare Quality (NICHQ)
<http://www.nichq.org>

National Institute of Child Health and Human Development
(NICHD) <http://www.nichd.nih.gov>

Sidelines National High-Risk Pregnancy Support Networks
<http://www.sidelines.org>

Women's and Children's Health Policy Center (WCHPC),
School of Public Health, Johns Hopkins University
<http://www.jhsph.edu/wchpc>

Zero to Three: National Center for Infants, Toddlers, and
Families <http://www.zerotothree.org>

See also Birth Defects; Childbirth; Immunization and
Vaccination; Pediatrics; Public Health

35. Chiropractic Care

Chiropractic care involves the care provided to patients that involves the musculoskeletal system and spine. The treatment provided by chiropractors may involve spinal manipulation and manual therapy.

American Chiropractic Association (ACA)
<http://www.amerchiro.org>

Council on Chiropractic Orthopedics (CCO)
<http://www.ccodc.org>

Foundation for Chiropractic Education and Research
(FCER) <http://www.fcer.org>

International Chiropractors Association (ICA)
<http://www.chiropractic.org>

See also Chronic Diseases; Injury; Physical Medicine and
Rehabilitation; Physicians; Spinal Disorders and Injuries

36. Chronic Diseases

Chronic diseases are diseases that are persistent or long-lasting in nature. It is estimated that nearly one in two Americans have a chronic disease.

Chronic Disease Prevention Alliance of Canada
(CDPAC) <http://www.cdpac.ca>

Improving Chronic Illness Care Program
<http://www.improvingchroniccare.org>

National Center for Chronic Disease Prevention and Health
Promotion (NCCDPHP) <http://www.cdc.gov/nccdphp>

National Institute on Aging (NIA) <http://www.nia.nih.gov>

See also Arthritis and Rheumatism; Asthma; Cancer; Diabetes;
Heart Disease; Hypertension

37. Clinical Laboratories

Clinical laboratories are facilities that provide clinical tests and diagnostic services and they play an important role in the healthcare system.

American Clinical Laboratory Association (ACLA)
<http://www.clinical-labs.org>

American Society for Clinical Laboratory Science (ASCLS)
<http://www.ascls.org>

Clinical and Laboratory Standards Institute (CLSI) (This organization was formerly the National Committee for Clinical Laboratory Standards [NCCLS])
<http://www.nccls.org>

Clinical Laboratory Management Association (CLMA)
<http://www.clma.org>

See also Hospitals; Medical Technologists; Medical Tests and Diagnostics

38. Clinical Practice Guidelines

Clinical practice guidelines are evidence based and serve to provide guidance to providers on the prevention, diagnosis, prognosis, and treatment of medical conditions.

Agency for Healthcare Research and Quality (AHRQ)
<http://www.ahrq.gov>

Agency for Healthcare Research and Quality (AHRQ) Guidelines
<http://www.ahrq.gov/clinic>

Alberta (Canada) Medical Association Clinical Practice Guidelines
<http://www.topalbertadoctors.org/cpg.html>

American Academy of Pediatrics (AAP)
<http://www.aap.org>

American Association of Clinical Endocrinology (AACE) Guidelines
<http://www.aace.com/pub/guidelines>

American College of Cardiology (ACC)/American Heart Association (AHA) Clinical Guidelines
<http://www.acc.org/clinical/guidelines/index.html>

American College of Gastroenterology (ACG) Guidelines
<http://www.acg.gi.org>

American College of Rheumatology Clinical Guidelines
<http://www.rheumatology.org>

American Society of Anesthesiology Clinical Guidelines
<http://www.asahq.org/publicationsAndServices/sgstoc.htm>

Australian Clinical Guidelines
<http://www.mihsr.monash.org/ccce/res>

Canadian Medical Association (CMA) Clinical Practice Guidelines
<http://www.cma.ca/cpgs>

Canadian Task Force on Preventive Health Care (CTFPHC)
<http://www.ctfphc.org>

Cardiac Surgery Clinical Practice Guidelines (Cedars-Sinai)
<http://www.csmc.edu/cvs/md/guide.html>

Cholesterol Clinical Guidelines
<http://www.nhlbi.nih.gov/guidelines/cholesterol/index.htm>

Cochrane Library
<http://www.cochrane.co.uk>

Diabetes Guidelines (American Association of Clinical Endocrinologists)
<http://www.aace.com/pub/pdf/guidelines/DMGuidelines2007.pdf>

eGuidelines (This Web site contains a comprehensive collection of United Kingdom clinical guidelines and related information)
<http://www.eguidelines.co.uk>

Health Services/Technology Assessment (HSTAT)
<http://text.nlm.nih.gov>

National Guideline Clearinghouse (NGC)
<http://www.guideline.gov>

National Institute for Health and Clinical Excellence (NICE), United Kingdom
<http://www.nice.org.uk>

National Quality Measures Clearinghouse
<http://www.qualitymeasures.ahrq.gov>

See also Evidence-Based Medicine EBM; Health Outcomes; Medical Decision Making; Medical Practice Variations; Randomized Controlled Trials (RCT)

39. Community Health Centers (CHCs)

Community health centers are primary care clinics in communities that provide access to healthcare and function as a vital part of the healthcare safety net.

Bureau of Primary Health Care (BPHC), Health Resources and Services Administration (HRSA)
<http://www.bphc.hrsa.gov>

National Association of Community Health Centers (NACHC)
<http://www.nachc.com>

See also Ambulatory Care; Health Disparities; Minority Health; Public Health

40. Complementary and Alternative Medicine

Complimentary and alternative medicine are the medical products and practices that fall outside the realm of traditional Western medicine and standards of care. Studies are beginning to be undertaken to better understand the potential benefits of alternative and complimentary medicine.

Acupuncture Foundation of Canada Institute
<http://www.afcinstitute.com>

Alternative Medicine Homepage
<http://www.pitt.edu/~cbw/altm.html>

American Association of Oriental Medicine (AAOM)
<http://www.aaom.org>

American Society of Alternative Therapists (ASAT)
<http://www.asat.org>

Entirely On-Line Alternative Medicine Primer
<http://www.veterinarywatch.com/Primer1.htm>

HerbMed <http://www.herbmed.org>

National Center for Complementary and Alternative Medicine (NCCAM) (This center was formed at NIH in 1999)
<http://www.nccam.nih.gov>

National Certification Commission for Acupuncture and Oriental Medicine (NCCAOM) <http://www.nccaom.org>

National Institutes of Health, Office of Dietary Supplements <http://dietary-supplements.info.nih.gov>

Rosenthal Center for Complementary and Alternative Medicine <http://www.rosenthal.hs.columbia.edu>

See also Chiropractic Care; National Institutes of Health (NIH)

41. Consumer-Directed Health Plans (CDHPs)

Consumer-directed health plans are a type of arrangement that allows individuals to use health savings accounts or other products to pay for routine healthcare services. Additionally, a high-deductible health plan protects the individual from catastrophic expenses.

Consumer-Driven Health Care Institute (CDHCI)
<http://www.cdhci.org>

Defined Care <http://www.definedcare.com>

See also Health Insurance

42. Consumer Health Information

Consumer health information is information that is made available to consumers on health-related questions including such topics as cost, quality, and alternative treatment options.

Center for Medical Consumers
<http://www.medicalconsumers.org>

Federal Citizen Information Center <http://www.pueblo.gsa.gov>

HospitalWeb <http://neuro-www.mgh.harvard.edu/hospitalweb.shtml>

Mayo Clinic <http://www.mayoclinic.com>

MedConnect <http://www.medconnect.com>

Merck Source <http://www.mercksource.com>

My Medicare Matters, The National Council on the Aging <http://www.mymedicarematters.org>

National Health Information Center (NHIC)
<http://www.health.gov/nhic>

NOAH (New York Online Access to Health)
<http://www.noah-health.org>

PDR (Physician's Desk Reference) Health
<http://www.pdrhealth.com>

Virtual Hospital: Information for Patients
<http://www.uihealthcare.com/vh>

WebMD <http://www.webmd.com>

Your Disease Risk, Siteman Cancer Center
<http://www.yourdiseaserisk.wustl.edu>

See also Centers for Medicare and Medicaid Services (CMS); Health Outcomes; Health Report Cards; Quality of Healthcare

43. Cosmetic and Plastic Surgery

Cosmetic and plastic surgery is a surgical specialty that focuses on enhancing one's appearance or correcting the form or function of a body part.

American Academy of Cosmetic Surgery (AACCS)
<http://www.cosmeticsurgery.org>

American Academy of Facial Plastic and Reconstructive Surgery (AAFPRS) <http://www.aafprs.org>

American Society of Plastic Surgeons (ASPS)
<http://www.plasticsurgery.org>

See also Birth Defects; Burn Care; Injury; Surgery and Surgeons

44. Cost-Benefit and Cost-Effectiveness Analysis

Cost-benefit and cost-effectiveness analysis are types of economic analyses that are done to compare the relative expenditures in relation to outcomes among two or more competing interventions.

Cost Effectiveness Analysis Registry <https://research.tufts-nemc.org/cear/default.aspx>

See also Health Economics, Academic Centers of; Randomized Controlled Trials (RCT); Technology Assessment

45. Critical Care

Critical care is the specialized care provided to patients who are critically ill and require constant monitoring and possibly need life support.

Society of Critical Care Medicine (SCCM)
<http://www.sccm.org>

See also Emergency Medicine; Hospitalists; Hospitals; Injury

46. Deafness and Hearing Impairment

Deafness and hearing impairment is a disability that results in partial or total hearing loss in one or both ears. The level of hearing impairment that a person experiences may range from mild to severe.

Alexander Graham Bell Association for the Deaf and Hard of Hearing <http://www.agbell.org>

Canadian Hard of Hearing Association (CHHA)
<http://www.chha.ca>

Deafness Research Foundation (DRF) <http://www.drf.org>

Dogs for the Deaf (DFD) <http://www.dogsforthe deaf.org>

Helen Keller National Center for Deaf-Blind Youths and Adults (HKNC) <http://www.hknc.org>

International Hearing Society (IHS) <http://www.ihinfo.org>

National Association of the Deaf (NAD) <http://www.nad.org>

National Consortium on Deaf-Blindness <http://nationaldb.org>

National Institutes on Deafness and Other Communication Disorders (NIDCD) Information Clearinghouse
<http://www.nidcd.nih.gov>

Registry of Interpreters for the Deaf (RID) <http://www.rid.org>

Self Help for Hard of Hearing People (SHHH)
<http://www.hearingloss.org>

See also Disability

47. Dental Research

Dental research involves clinical research that is focused on oral health.

American Association for Dental Research (AADR)
<http://www.aadronline.org>

International Association for Dental Research (IADR)
<http://www.iadr.com>

National Institute of Dental and Craniofacial Research (NIDCR) <http://www.nidcr.nih.gov>

See also Dentistry; Dentistry, Public Health; Oral Health

48. Dentistry

Dentistry is the profession that is focused on the prevention, evaluation, diagnosis, and treatment of conditions of the oral cavity and maxillofacial area. Dentists are a key component in promoting oral health.

Academy of General Dentistry (AGD) <http://www.agd.org>

American Academy of Cosmetic Dentistry (AACD)
<http://www.aacd.com>

American Academy of Pediatric Dentistry (AAPD)
<http://www.aapd.org>

American Academy of Periodontology (AAP)
<http://www.perio.org>

American Association of Endodontists (AAE)
<http://www.aae.org>

American Association of Orthodontists (AAO)
<http://www.braces.org>

American College of Dentists (ACD) <http://www.acd.org>

American Dental Assistants Association (ADAA)
<http://www.dentalassistant.org>

American Dental Association (ADA) <http://www.ada.org>

American Dental Hygienists' Association (ADHA)
<http://www.adha.org>

See also Dentistry, Public Health; Oral Health; Public Health

49. Dentistry, Public Health

Public health dentistry is the field of dentistry that focuses on the oral health of a community as opposed to an individual patient. Public health dentists work to promote oral health policy, evaluate the oral health needs of a community, and provide services that improve overall oral health.

Association of State and Territorial Dental Directors (ASTDD)
<http://www.astdd.org>

Canadian Association of Public Health Dentistry
<http://www.caphd-acsdp.org>

See also Dentistry; Oral Health; Public Health

50. Dermatology

Dermatology is the field of medicine that is focused on the skin and its associated diseases, and includes both medical and surgical aspects.

American Dermatological Association (ADA)
<http://www.amer-derm-assn.org>

Society for Investigative Dermatology (SID)
<http://www.sidnet.org>

See also Ambulatory Care; Burn Care; Physicians

51. Diabetes

Diabetes is a metabolic disorder and chronic condition that results in the body being unable to break down blood sugar properly. Diabetes can be caused by genetics or the environment.

American Association of Diabetes Educators (AADE)
<http://www.aadenet.org>

American Diabetes Association (ADA)
<http://www.diabetes.org>

Division of Diabetes Treatment and Prevention, Indian Health Service (IHS)
<http://www.ihs.gov/medicalprograms/diabetes>

International Diabetes Federation (IDF) <http://www.idf.org>

National Diabetes Information Clearinghouse (NDIC)
<http://www.diabetes.niddk.nih.gov>

National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) <http://www2.niddk.nih.gov>

See also Diet and Nutrition; Fitness and Exercise; Genetics; Overweight and Obesity; Public Health

52. Diet and Nutrition

Diet and nutrition refer to the consumption of food and the nutrients required to sustain life.

American Council for Fitness and Nutrition (ACFN)
<http://www.acfn.org>

American Dietetic Association (ADA) <http://www.eatright.org>

American Society for Parenteral and Enteral Nutrition (ASPEN) <http://www.nutritioncare.org>

Center for Food Safety and Applied Nutrition, Outreach and Information Center
<http://www.cfsan.fda.gov/~comm/oic-info.html>

Center for Nutrition and Policy Promotion, U.S. Department of Agriculture <http://www.usda.gov/cnpp>

Dietary Managers Association (DMA)
<http://www.dmaonline.org>

Food and Nutrition Board (FNB)
<http://www.iom.edu/board.asp?id=3788>

Food and Nutrition Information Center, U.S. Department of Agriculture <http://fnic.nal.usda.gov>

Food Safety and Inspection Service, U.S. Department of Agriculture <http://www.fsis.usda.gov>

International Life Sciences Institute North America (ILSINA) <http://www.ilsina.org>

National Resource Center on Nutrition, Physical Activity and Aging, Florida International University, Miami, FL
<http://nutritionandaging.fiu.edu/index.asp>

Weight-Control Information Network <http://win.niddk.nih.gov>

See also Eating Disorders; Overweight and Obesity; Public Health

53. Digestive Disorders

Digestive disorders are disorders that affect the digestive system and/or its organs.

National Digestive Diseases Information Clearinghouse (NDDIC) <http://www.digestive.niddk.nih.gov>

National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) <http://www2.niddk.nih.gov>

See also Diet and Nutrition; Public Health

54. Disability

Disability is having a lack of ability as compared to a normal group of persons.

American Academy of Disability Evaluating Physicians (AADEP) <http://www.aadep.org>

Amputee Coalition of America (ACA)
<http://www.amputee-coalition.org>

Clearinghouse on Disability Information
<http://www.ed.gov/about/offices/list/ose/>

Consortium for Citizens with Disabilities <http://www.c-c-d.org>

Disability Resources on the Internet
<http://www.disabilityresources.org>

International Center for Disability Resources on the Internet (ICDRI) <http://www.icdri.org>

National Center for the Dissemination of Disability Research (NCDDR) <http://www.ncddr.org>

National Dissemination Center for Children with Disabilities <http://www.nichcy.org>

National Institute on Aging (NIA) <http://www.nia.nih.gov>

World Committee on Disability <http://www.worldcommitteendisability.org>

See also Assisted Living; Blind and Visually Impaired; Chronic Diseases; Deafness and Hearing Impairment; Mentally Disabled; Nursing Homes; Physical Medicine and Rehabilitation

55. Disaster Preparedness and Relief

Disaster preparedness and relief is the process of being prepared for a disaster before it strikes and dealing with this event after it occurs. Several agencies and organizations are committed specifically to responding to disasters.

American Disaster Reserve (ADR) <http://www.disasterreserve.us>

American Red Cross National Headquarters (ARC) <http://www.redcross.org>

Center for International Disaster Information (CIDI) <http://www.cidi.org>

Federal Emergency Management Agency (FEMA) <http://www.fema.gov>

International Association of Emergency Managers (IAEM) <http://www.iaem.com>

International Emergency Management Society (TIEMS) <http://www.tiems.org>

National Voluntary Organizations Active in Disaster (NVOAD) <http://www.nvoad.org>

See also Bioterrorism; Federal Government; Influenza Pandemic; Public Health

56. Disease and Procedure Classifications

Disease and procedure classifications is a standardized classification system used to categorize diseases and medical procedures.

ICD9/ICD9CM Codes <http://icd9cm.chrisendres.com>

National Center for Health Statistics (NCHS), Classification of Diseases, Functioning and Disability <http://www.cdc.gov/nchs/icd9.htm>

Physician Outpatient CPT-4 Procedure <http://www.myhealthscore.com/consumer/phyoutcptsearch.htm>

World Health Organization (WHO) Classification of Diseases (ICD) <http://www.who.int/classifications/icd>

See also Hospitals; Medical Billing; Medical Records; Medical Sociology; Mental Health; World Health Organization (WHO)

57. Disease Management

Disease management is a patient management process that is used to improve the quality of life and control healthcare costs through integrated care for individuals with chronic conditions.

Disease Management Association of America (DMAA) <http://www.dmaa.org>

See also AIDS/HIV; Case Management; Chronic Diseases; Disability

58. Donors and Organ Transplantation

Donors are individuals who donate their blood or organs to people in need. Organ transplantation is the act of replacing a diseased organ with a functional one from an organ donor. A number of organizations are available to assist with organ donors and transplant recipients.

American Association of Tissue Banks (AATB) <http://www.aatb.org>

American Bone Marrow Donor Registry (ABNDR) <http://www.charityadvantage.com/abmdr/Home.asp>

American Society of Transplantation (ASTA) <http://www.a-s-t.org>

Center for International Blood and Marrow Research (CIBMTR) <http://www.cibmtr.org>

Children's Organ Transplant Association (COTA) <http://www.cota.org>

Eye Bank Association of America (EBAA) <http://www.restoresight.org>

Eye Bank for Sight Restoration (EBSR) <http://www.eyedonation.org>

International Society for Heart and Lung Transplantation (ISHLT) <http://www.isHLT.org>

Kidney Transplant/Dialysis Association (KT/DA) <http://www.ktda.org>

Living Bank International (TLBI) <http://www.livingbank.org>

National Marrow Donor Program (NMDP)
<http://www.marrow.org>

National Bone Marrow Transplant Link (NBMTL)
<http://www.nbmtlink.org>

United Network for Organ Sharing (UNOS)
<http://www.unos.org>

See also Blood and Blood Banks; Kidney Diseases; Liver Diseases; Surgery and Surgeries

59. Drugs

Drugs are chemical substances that are used to prevent, treat, or cure diseases. Drugs may be used intermittently for acute episodes or on a regular basis to treat chronic diseases.

American Association of Poison Control Centers (AAPCC) <http://www.aapcc.org>

Drug InfoNet <http://www.druginfonet.com>

Drug Information Association (DIA) <http://www.diahome.org>

Electronic Orange Book—Approved Drug Products with Therapeutic Equivalence Evaluations
<http://www.fda.gov/cder/ob/default.htm>

Food and Drug Administration (FDA) <http://www.fda.gov>

Food and Drug Administration (FDA) Drug Approvals List (This list is updated weekly) <http://www.fda.gov/cder/da/da.htm>

Johns Hopkins Antibiotic Guide <http://hopkins-abxguide.org>

New Medicines in Development
http://www.phrma.org/medicines_in_development

NewsRx <http://www.newsrx.com>

Pharmaceutical Research and Manufacturers of America (PhRMA) <http://www.phrma.org>

Recently Approved Drugs or Indications—Doctors Guide
<http://www.docguide.com/news/content.nsf/Drugs-Indications>

RxList (This website lists the top 200 drugs prescribed in the United States) <http://www.rxlist.com>

SafeMedication.com <http://www.safemedication.com>

U.S. Pharmacopeia <http://www.usp.org>

See also Pharmaceuticals; Pharmacists and Pharmacy; Pharmacoeconomics

60. Drugs, Generic

Generic drugs are pharmaceutical agents that contain the same active ingredients as a brand name drug and are produced without a patent protection.

Canadian Generic Pharmaceutical Association (CGPA)
<http://www.canadiangenerics.ca>

Generic Pharmaceutical Association (GPhA)
<http://www.gphaonline.org>

European Generic Medicines Association (EGM)
<http://www.eggenerics.com>

See also Drugs, Prices of; Pharmaceutical Companies, List of; Pharmacists and Pharmacy; Pharmacoeconomics

61. Drugs, Prices of

Prices of drugs are the charges related to pharmaceutical agents.

National Legislative Association on Prescription Drug Prices (NLARX) <http://www.nlarx.org>

See also Drugs; Pharmacoeconomics

62. Eating Disorders

Eating disorders cause a person to compulsively eat or avoid eating. Eating disorders may lead to other health consequences such as hypertension, cardiovascular disease, and morbid obesity, among others.

European Council on Eating Disorders (ECED)
<http://www.eced.org.uk>

International Association of Eating Disorders Professionals (IAEDP) <http://www.iaedp.com>

National Association of Anorexia Nervosa and Associated Disorders (ANAD) <http://www.anad.org>

National Eating Disorders Association (NEDA)
<http://www.nationaleatingdisorders.org>

See also Diet and Nutrition; Overweight and Obesity

63. E-Health

E-health involves the integration of information technology with healthcare to improve the quality, safety, and efficiency of the system.

e-Health Initiative <http://www.ehealthinitiative.org>

Internet Healthcare Coalition
<http://www.ihealthcoalition.org>

SATELLIFE Global Health Information Network
<http://www.satellife.org>

See also Informatics; Information Technology (IT); Telemedicine

64. Emergency Medicine

Emergency medicine is the specialty of medicine that focuses on treating patients with acute conditions that require urgent attention.

- American Academy of Emergency Medicine (AAEM)
<http://www.aaem.org>
- American College of Emergency Physicians (ACEP)
<http://www.acep.org>
- American College of Osteopathic Emergency Physicians (ACOEP) <http://www.acoep.org>
- American Trauma Society (ATS) <http://www.amtrauma.org>
- Emergency Nurses Association (ENA) <http://www.ena.org>
- National Association of Emergency Medical Technicians (NAEMT) <http://www.naemt.org>
- National Association of EMS Educators
<http://www.naemse.org>
- National Association of EMS Physicians
<http://www.naemsp.org>
- National Association of State EMS Officials
<http://www.nasemsd.org>
- National Registry of Emergency Medical Technicians (NREMT) <http://www.nremt.org>
- Society for Academic Emergency Medicine (SAEM)
<http://www.saem.org>

See also Burn Care; Hospitals; Injury; Occupational Medicine

65. Emerging Diseases

Emerging infections are infectious diseases that are new, emerging, or re-emerging drug-resistant diseases. These infections have recently increased in populations and their incidence is likely to grow.

- Center for Infectious Disease Research and Policy (CIDRAP),
 University of Minnesota, Minneapolis, MN
<http://www.cidrap.umn.edu/cidrap>
- Center for the Study of Bioterrorism and Emerging Infections,
 School of Public Health, St. Louis University, St. Louis,
 MO <http://www.slu.edu/colleges/sph/bioterrorism>
- Emerging Infectious Diseases <http://www.cdc.gov/ncidod/eid>
- Infectious Diseases Society of America Emerging Infections
 Network (IDSAEIN) <http://www.ein.idsociety.org>

See also Centers for Disease Control and Prevention (CDC); Hospital Infections and Nosocomial Diseases; Infectious Diseases; Influenza Pandemic; World Health Organization (WHO)

66. Environmental Health

Environmental health is concerned with the physical, biological, and chemical factors that affect a person's health. This field promotes efforts to assess and control environmental factors that may negatively impact one's well-being.

- Agency for Toxic Substances and Disease Registry (ATSDR) <http://www.atsdr.cdc.gov>
- Indoor Air Quality Information Clearinghouse
<http://www.epa.gov/iaq>
- National Center for Environmental Health (NCEH)
<http://www.cdc.gov/nceh>
- National Environmental Health Association (NEHA)
<http://www.neha.org>
- National Institute of Environmental Health Sciences (NIEHS) <http://www.niehs.nih.gov>
- National Lead Information Center
<http://www.epa.gov/lead/pubs/nlic.htm>
- National Pesticide Information Center <http://npic.orst.edu>
- Safe Drinking Water Hotline
<http://www.epa.gov/safewater/hotline>
- Society of Environmental Toxicology and Chemistry (SETAC) <http://www.setac.org>
- U.S. Environmental Protection Agency (EPA)
<http://www.epa.gov>
- U.S. Environmental Protection Agency (EPA) Headquarters
 Library <http://www.epa.gov/natlibra/hqirc>

See also Epidemiology; Public Health

67. Epidemiology

Epidemiology is the study of factors that cause disease or affect health. Epidemiology serves as the foundation for public health and preventive medicine.

- American College of Epidemiology <http://acepidemiology2.org>
- Council of State and Territorial Epidemiologists (CSTE)
<http://www.cste.org>
- International Clinical Epidemiology Network (INCLIN)
<http://www.inclen.org>
- Morbidity and Mortality Weekly Report (MMWR)
<http://www.cdc.gov/mmwr>
- Society for Healthcare Epidemiology of America (SHEA)
<http://www.shea-online.org>
- Weekly Epidemiological Record (WER)
<http://www.who.int/wer>

See also Centers for Disease Control and Prevention (CDC); Disease and Procedure Classifications; Public Health; World Health Organization (WHO)

68. Ethics

Ethics is the branch of philosophy that studies issues related to right conduct. Bioethics more specifically focuses on ethical questions that arise due to the advancements of medicine and biology.

Alden March Bioethics Institute (AMBI), Albany Medical Center <http://www.bioethics.org>

American Society of Law, Medicine, and Ethics (ASLME) <http://www.aslme.org>

Applied Research Ethics National Association (ARENA) <http://www.arena.org>

Association for Practical and Professional Ethics <http://www.indiana.edu/~appe>

Bioethics.Net <http://www.bioethics.net>

Bioethics for Clinicians http://www.cmaj.camisc/bioethics_e.shtml

Center for Bioethics, University of Pennsylvania <http://www.bioethics.upenn.edu>

Center for Medical Ethics and Health Policy, Baylor College of Medicine <http://www.bcm.edu/ethics>

Ethics in Medicine, University of Washington <http://depts.washington.edu/bioethx>

Hastings Center (HC) <http://www.thehastingscenter.org>

National Reference Center for Bioethics Literature <http://bioethics.georgetown.edu/databases/index.htm>

Neiswanger Institute for Bioethics and Health Policy, Stritch School of Medicine, Loyola University, Chicago <http://bioethics.lumc.edu>

See also Fraud and Abuse; Health Law; Regulation

69. Evidence-Based Medicine (EBM)

Evidence-based medicine is the application of the best evidence gained from scientific medical studies. Evidence-based medicine is used to make clinical judgments regarding the best course of care for patients.

Bandolier Evidence-Based Health Care <http://www.jr2.ox.ac.uk/bandolier>

Canadian Association for Population Therapeutics <http://www.capt-actp.com>

Center for Evidence-Based Medicine <http://www.cebm.net/index.asp>

Centre for Health Evaluation and Outcome Science (Canada) <http://www.cheos.ubc.camain.html>

ECRI: Emergency Care Research Institution (This institution is designated as an Evidence-Based Practice Center by the Agency for Healthcare Quality and Research) <http://www.ecri.org>

Institute for Clinical Evaluative Sciences (Canada) <http://www.ices.on.ca>

New York Academy of Medicine, Evidence-Based Medicine Resource Center <http://www.ebmny.org>

Understanding Medical Information (Evidence-Based) <http://www.noah-health.org/n/ebm>

See also Clinical Practice Guidelines; Health Outcomes; Quality of Healthcare; Randomized Controlled Trials (RCT)

70. Eye Diseases

Eye diseases are conditions that cause problems to the eye. These conditions may range from minor issues to permanent vision loss.

Association for Macular Diseases (AMD) <http://www.macula.org>

All About Vision <http://www.allaboutvision.com>

Glaucoma Foundation (TGF) <http://www.glaucomafoundation.org>

Glaucoma Research Foundation <http://www.glaucoma.org>

International Eye Foundation (IEF) <http://www.iefusa.org>

National Eye Institute (NEI) <http://www.nei.nih.gov>

National Glaucoma Research Program, American Health Assistance Foundation (AHAF) <http://www.ahaf.org/glaucoma/about/about.htm>

See also Blind and Visually Impaired; Epidemiology; Ophthalmology; Optometry; Prevention and Health Promotion; Public Health

71. Federal Government

The federal government is the central governing body of the United States and it is divided into the judicial, legislative, and executive branches. Through its policies, the federal government may have a significant impact both domestically and abroad.

Agency for Healthcare Research and Quality (AHRQ) (AHRQ was formerly the Agency for Health Care Policy and Research) <http://www.ahrq.gov>

Bureau of Health Professions (BHPr) <http://www.bhpr.hrsa.gov>

- Bureau of Labor Statistics (BLS) <http://www.bls.gov>
- Census Bureau <http://www.census.gov>
- Centers for Disease Control and Prevention (CDC) <http://www.cdc.gov>
- Centers for Medicare and Medicaid Services (CMS) (CMS was formerly the Health Care Financing Administration (HCFA)) <http://www.cms.hhs.gov>
- Congressional Budget Office (CBO) <http://www.cbo.gov>
- Congressional Research Service <http://www.loc.gov/crsinfo>
- Consumer Product Safety Commission (CPSC) <http://www.cpsc.gov>
- Department of Agriculture (USDA) <http://www.usda.gov>
- Department of Health and Human Services (HHS) <http://www.hhs.gov>
- Department of Homeland Security (DHS) <http://www.dhs.gov>
- Department of Justice <http://www.usdoj.gov>
- Department of State <http://www.state.gov>
- Department of Veterans Affairs (VA) <http://www.va.gov>
- Environmental Protection Agency (EPA) <http://www.epa.gov>
- Federal Budget <http://www.whitehouse.gov/omb/budget/fy2006/budget.html>
- Federal Emergency Management Agency (FEMA) <http://www.fema.gov>
- Federal Judiciary <http://www.uscourts.gov>
- Federal Legislation <http://thomas.loc.gov>
- Federal Register <http://www.gpoaccess.gov/fr>
- FirstGov (This is a comprehensive portal to government sites) <http://www.firstgov.gov>
- Food and Drug Administration (FDA) <http://www.fda.gov>
- General Accountability Office (GAO) <http://www.gao.gov>
- Healthfinder (This is a service of the Office of Disease Prevention and Health Promotion) <http://www.healthfinder.gov>
- Health Resources and Services Administration (HRSA) <http://www.hrsa.gov>
- House Committee on Appropriations <http://appropriations.house.gov>
- House Committee on Energy and Commerce <http://energycommerce.house.gov>
- House Committee on Ways and Means <http://waysandmeans.house.gov>
- House of Representatives <http://www.house.gov>
- House Office of Legislative Counsel <http://legcoun.house.gov/public.htm>
- Indian Health Service (IHS) <http://www.ihs.gov>
- Library of Congress (LOC) <http://www.loc.gov>
- Medicare Payment Advisory Commission (MedPAC) <http://www.medpac.gov>
- National Center for Health Statistics (NCHS) <http://www.cdc.gov/nchs>
- National Institutes of Health (NIH) <http://www.nih.gov>
- National Library of Medicine (NLM) (The NLM's Web-based databases include PubMed/Medline and Medline Plus) <http://www.nlm.gov/hinfo.html>
- Occupational Safety and Health Administration (OSHA) <http://www.osha.org>
- Office of Disease Prevention and Health Promotion (ODPHP) <http://odphp.osophs.hhs.gov>
- Office of Management and Budget (OMB) <http://www.whitehouse.gov/omb>
- Organization for Economic Co-operation and Development (OECD) <http://www.oecd.org>
- President's Commission to Strengthen Social Security (CSSS) <http://www.csss.gov>
- President's Management Agenda http://www.whitehouse.gov/omb/budgintegration/pma_index.html
- Senate <http://www.senate.gov>
- Senate Committee on Appropriations <http://appropriations.senate.gov>
- Senate Committee on Finance <http://finance.senate.gov>
- Senate Committee on Health, Education, Labor, and Pensions <http://help.senate.gov>
- Senate Office of Legislative Counsel <http://slc.senate.gov/index.htm>
- Social Security Administration (SSA) <http://www.ssa.gov>
- Substance Abuse and Mental Health Services Administration (SAMHSA) <http://www.samhsa.gov>
- U.S. Government Printing Office (GPO) (The GPO publishes the Federal Register and other government reports) <http://www.access.gpo.gov>
- U.S. Public Health Service <http://www.usphs.gov>
- White House <http://www.whitehouse.gov>
- See also** Centers for Disease Control and Prevention (CDC); Centers for Medicare and Medicaid Services (CMS); Federal Health Information Centers and Clearinghouses; National Institutes of Health (NIH)

72. Federal Health Information Centers and Clearinghouses

Federal health information centers and clearinghouses provide the public with publications and referrals, and answer inquiries on a variety of health-related topics.

ABLEDATA (This site lists assistive devices and rehabilitation equipment products for people with disabilities)
<http://www.abledata.com>

Alzheimer's Disease Education and Referral Center
<http://www.alzheimers.org>

Cancer Information Service <http://www.cancer.gov>

CDC National Prevention Information Network
<http://www.cdcnpin.org>

Center for Food Safety and Applied Nutrition, Outreach and Information Center
<http://www.cfsan.fda.gov/~comm/oic-info.html>

Clearinghouse on Disability Information
<http://www.ed.gov/about/offices/list/osers>

Drug Policy Information Clearinghouse
<http://www.whitehousedrugpolicy.gov/about/clearingh.html>

Educational Resources Information Center (ERIC)
<http://www.eric.ed.gov>

Environmental Protection Agency Headquarters Library
<http://www.epa.gov/natlibra/hqirc>

Federal Citizen Information Center
<http://www.pueblo.gsa.gov>

Food and Nutrition Information Center
<http://www.nal.usda.gov/fnic>

Genetic and Rare Diseases Information Center
<http://www.genome.gov/10000409>

Health Resources and Services Administration Information Center <http://www.ask.hrsa.gov>

Housing and Urban Development User
<http://www.huduser.org>

Indoor Air Quality Information Clearinghouse
<http://www.epa.gov/iaq>

Maternal and Child Health Information Resource Center
<http://www.mchb.hrsa.gov/mchirc>

Maternal and Child Health Library
<http://www.mchlibrary.info>

National Adoption Information Clearinghouse
<http://naic.acf.hhs.gov>

National Aging Information and Referral Support Center
http://www.nasua.org/issues/tech_assist_resources/national_aging_ir_support_ctr

National Audiovisual Center at NTIS
<http://www.ntis.gov/products/nac.aspx>

National Center for Complementary and Alternative Medicine Information Clearinghouse <http://nccam.nih.gov>

National Center for the Dissemination of Disability Research
<http://www.ncddr.org>

National Center on Elder Abuse
<http://www.elderabusecenter.org>

National Center on Sleep Disorders Research
<http://www.nhlbi.nih.gov/sleep>

National Child Care Information Center <http://nccic.org>

National Clearinghouse on Child Abuse and Neglect Information <http://nccanch.acf.hhs.gov>

National Clearinghouse on Families and Youth
<http://www.ncfy.com>

National Consortium on Deaf-Blindness <http://nationaldb.org>

National Criminal Justice Reference Service
<http://www.ncjrs.org>

National Diabetes Information Clearinghouse
<http://diabetes.niddk.nih.gov>

National Digestive Diseases Information Clearinghouse
<http://digestive.niddk.nih.gov>

National Dissemination Center for Children with Disabilities
<http://www.nichcy.org>

National Eldercare Locator <http://www.eldercare.gov>

National Guideline Clearinghouse <http://www.guideline.gov>

National Health Information Center
<http://www.health.gov/nhic>

National Heart, Lung, and Blood Institute Health Information Center <http://www.nhlbi.nih.gov>

National Information Center on Health Services Research and Health Care Technology (NICHSR)
<http://www.nlm.nih.gov/nichsr>

National Injury Information Clearinghouse
<http://www.cpsc.gov/about/clrnghse.html>

National Institute for Occupational Safety and Health Information Inquiry Service
<http://www.cdc.gov/niosh/inquiry.html>

National Institute of Arthritis and Musculoskeletal and Skin Diseases Information Clearinghouse
<http://www.niams.nih.gov>

National Institute of Child Health and Human Development Information Resource Center <http://www.nichd.nih.gov>

National Institute of Dental and Craniofacial Research
<http://www.nidcr.nih.gov/HealthInformation>

National Institute on Aging Information Center
<http://www.nia.nih.gov>

National Institute on Deafness and Other Communication Disorders
 Information Clearinghouse <http://www.nidcd.nih.gov>

National Kidney and Urologic Diseases Information
 Clearinghouse <http://www.kidney.niddk.nih.gov>

National Lead Information Center <http://www.epa.gov/lead>

National Library Service for the Blind and Physically
 Handicapped <http://www.loc.gov/nls>

National Maternal and Child Oral Health Resource
 Center <http://www.mchoralhealth.org>

National Pesticide Information Center <http://npic.orst.edu>

National Quality Measures Clearinghouse
<http://www.qualitymeasures.ahrq.gov>

National Rehabilitation Information Center
<http://www.naric.com>

National Resource and Training Center on Homelessness and
 Mental Illness <http://www.nrchmi.samhsa.gov>

National SIDS/Infant Death Syndrome Resource Center
<http://www.sidscenter.org>

National Technical Information Service (NTIS)
<http://www.ntis.gov>

National Women's Health Information Center
<http://www.womenshealth.gov>

National Youth Violence Prevention Resource Center
<http://www.safeyouth.org>

NIH Osteoporosis and Related Bone Diseases National
 Resource Center <http://www.osteoporosis.nih.gov>

Office of Boating Safety <http://www.uscgboating.org>

Office of Minority Health Resource Center
<http://www.omhrc.gov>

Office of Population Affairs Clearinghouse
<http://opa.osophhs.hhs.gov/clearinghouse.html>

Office on Smoking and Health <http://www.cdc.gov/tobacco>

Policy Information Center <http://aspe.hhs.gov/pic>

Rural Assistance Center <http://www.raconline.org>

Rural Information Center <http://www.nal.usda.gov/ric>

Safe Drinking Water Hotline
<http://www.epa.gov/safewater/hotline>

SAMHSA's National Clearinghouse for Alcohol and Drug
 Information <http://ncadi.samhsa.gov>

SAMHSA's National Mental Health Information
 Center <http://www.mentalhealth.samhsa.gov>

Weight-Control Information Network
<http://win.niddk.nih.gov>

See also Federal Government; Health Libraries and Information
 Centers; Health Literacy; Health Report Cards

73. Fitness and Exercise

Fitness and exercise refers to workout regimens to keep
 people fit, healthy, and strong.

American Council for Fitness and Nutrition (ACFN)
<http://www.acfn.org>

American Council on Exercise (ACE) <http://www.acefitness.org>

Medical Fitness Association <http://medicalfitness.org>

National Association for Health and Fitness (NAHF)
<http://www.physicalfitness.org>

See also Diet and Nutrition; Prevention and Health Promotion;
 Self-Help

74. Foundations and Philanthropies

Foundations and philanthropies are organizations that
 have a charitable purpose. These organizations may
 provide financial support to outside entities or fund
 other charitable activities.

Annie E. Casey Foundation <http://www.aecf.org>

Bill and Melinda Gates Foundation
<http://www.gatesfoundation.org>

California Health Care Foundation <http://www.chcf.org>

Carnegie Corporation of New York <http://www.carnegie.org>

Commonwealth Fund <http://www.cmwf.org>

David and Lucile Packard Foundation <http://www.packard.org>

Duke Endowment <http://www.dukeendowment.org>

Ford Foundation <http://www.fordfound.org>

Foundation Center (Publishes an annual list of American
 foundations) <http://www.foundationcenter.org>

Henry J. Kaiser Family Foundation (KFF) <http://www.kff.org>

John A. Hartford Foundation <http://www.jhartfound.org>

John D. and Catherine T. MacArthur Foundation
<http://www.macfound.org>

Josiah Macy, Jr. Foundation
<http://www.josiahmacyfoundation.org>

Milbank Memorial Fund <http://www.milbank.org>

Pew Charitable Trusts <http://www.pewtrusts.org>

Robert Wood Johnson Foundation (RWJ) <http://www.rwjf.org>
 Rockefeller Foundation <http://www.rockfound.org>
 Wellcome Trust, United Kingdom <http://www.wellcome.ac.uk>
 William T. Grant Foundation
<http://www.wtgrantfoundation.org>
 W. K. Kellogg Foundation <http://www.wkkf.org>
 World Bank Group <http://www.worldbank.org>

See also Advocacy, Education, and Research Organizations;
 Health Policy Organizations

75. Fraud and Abuse

Fraud and abuse involve activities that may result in misinformation, overpayment, or other deceitful acts that result in harm.

America's Health Insurance Plans (AHIP)
<http://www.avoidfraud.org>
 MIB Group (The MIB Group was formerly the Medical Information Bureau) <http://www.mib.com>
 National Council Against Health Fraud (NCAHF)
<http://www.ncahf.com>
 National Health Care Anti-Fraud Association (NHCAA)
<http://www.nhcaa.org>
 Taxpayers Against Fraud (TAF) <http://www.taf.org>

See also Ethics; Health Law; Regulation

76. Genetics

Genetics is the heredity information that is passed on in living organisms. The application of genetics to molecular medicine holds much promise and potential in biotechnology.

American College of Medical Genetics (ACMG)
<http://www.acmg.net>
 American Society of Gene Therapy (ASGT) <http://www.asgt.org>
 International Society for Stem Cell Research (ISSCR)
<http://www.isscr.org>
 National Human Genome Research Institute (NHGRI)
<http://www.genome.gov>
 National Society of Genetic Counselors (NSGC)
<http://www.nsgc.org>
 Office of Genomics and Disease Prevention
<http://www.cdc.gov/genomics>

See also Blood Disorders; Diabetes; Disease and Procedure Classifications

77. Geographic Information Systems (GIS)

Geographic information systems (GIS) is a technology that is used to display trends, patterns, or relationships in geographic data. GIS systems in public health are used to better understand health outcomes, disease prevalence, and other health issues at different geographic levels.

Association of American Geographers (AAG)
<http://www.aag.org>
 Cancer Mortality Maps and Graphs (Shows various cancer rates in the United States for 1950–94)
<http://www3.cancer.gov/atlasplus>
 Census 2000 <http://www.census.gov/main/www/cen2000.html>
 EPA EnviroMapper <http://www.epa.gov/enviro/html/em>
 ESRI (Environmental Systems Research Institute)
<http://www.esri.com>
 FEMA Mapping and Analysis Center
<http://www.gismaps.fema.gov>
 GIS and Public Health (Public Health GIS News and Information is a bimonthly electronic report published by the National Center for Health Statistics) http://www.cdc.gov/nchs/about/otheract/gis/gis_publichealthinfo.htm
 GIS.com <http://www.gis.com>
 Interactive Atlas of Reproductive Health (This is a web-based GIS dealing with reproductive health issues such as infant mortality, fertility, and low birth weight)
<http://www.cdc.gov/reproductivehealth/gisatlas>
 National Geographic Society
<http://www.nationalgeographic.com>
 TOXMAP: Environmental Health E-Maps
<http://toxmap.nlm.nih.gov/toxmap/main/index.jsp>
 University Consortium for Geographic Information Science (UCGIS) <http://www.ucgis.org>
 USGS (U.S. Geological Survey) <http://geography.usgs.gov>
 Web-Based Injury and Statistics Inquiry System
<http://www.cdc.gov/injury/wisqars>
 World Health Organization Public Health Mapping
<http://www.who.int/csr/mapping>
See also Environmental Health; Health Planning; Medical Practice Variations; Population Estimates; Public Health; Rural Health

78. Gerontology

Gerontology is the study of the various aspects of aging. Several organizations are committed to better understanding and serving the needs of the elderly.

- American Geriatrics Society (AGS)
<http://www.americangeriatrics.org>
- Australian Association of Gerontology (AAG)
<http://www.aag.asn.au>
- British Geriatrics Society (BGS) <http://www.bgs.org.uk>
- British Society of Gerontology
<http://www.britishgerontology.org>
- Canadian Association on Gerontology <http://www.cagacg.ca>
- Center for Gerontology and Health Care Research, Brown University, Providence, RI <http://www.chcr.brown.edu>
- Gerontological Society of America (GSA)
<http://www.geron.org>
- Institute of Gerontology, Wayne State University, Detroit, MI <http://www.iog.wayne.edu>
- International Association of Gerontology and Geriatrics (IAGG) <http://www.iagg.com.br>
- International Psychogeriatric Association (IPA)
<http://www.ipa-online.org>
- New England Gerontological Association
<http://www.negaonline.org>
- See also* Aging; Disability; Nursing Homes; Physicians

79. Health

Health is the physical, social, and mental well-being of an individual. Health is shaped by biological, environmental, and behavioral factors as well as access to healthcare.

- American Council on Science and Health (ACSH)
<http://www.acsh.org>
- National Health Council (NHC) <http://www.nhcouncil.org>
- National Health Information Center
<http://www.health.gov/nhic>
- See also* Centers for Disease Control and Prevention (CDC); National Institutes of Health (NIH); World Health Organization (WHO)

80. Health Administration, Association of Academic Programs of

The Association of Academic Programs of Health Administration is comprised of a number of universities and colleges, faculty, individuals, and organizations that are committed to improving health through health management education.

- Association of University Programs in Health Administration (AUPHA) <http://www.aupha.org>

See also Health Administration, Graduate Programs in; Hospitals

81. Health Administration, Graduate Programs in

Graduate programs in health administration train students to become healthcare managers and administrators through education, research, and practice.

Alabama

- University of Alabama at Birmingham (UAB), Birmingham, AL <http://www.uab.edu/hsa>

Arizona

- Arizona State University, Tempe, AZ
<http://wpcarey.asu.edu/shmp/index.cfm>

Arkansas

- University of Arkansas for Medical Sciences, Little Rock, Arkansas <http://www.ualr.edu/hsadmin>

California

- California State University, Long Beach, Long Beach, CA <http://www.csulb.edu/colleges/chhs/departments/hca>
- Chapman University College, McChord Air Force Base, CA <http://www.chapman.edu/catalog/current/cuc/mha.html>
- San Diego State University, San Diego, CA
<http://publichealth.sdsu.edu/divisionhsa.php>
- University of California, Berkeley, Berkeley, CA
<http://www.haas.berkeley.edu/advantage/health>
- University of California, Los Angeles, Los Angeles, CA
<http://www.ph.ucla.edu/hs>
- University of Southern California, Los Angeles, CA
<http://www.usc.edu/schools/sppd>

Colorado

- University of Colorado at Denver, Denver, CO
<http://www.cudenver.edu/business>
- University of Colorado at Denver, Executive MBA in Health Administration <http://business.cudenver.edu/Disciplines/HealthAdmin/ExecHealthMBA>

Connecticut

Yale University, School of Public Health, New Haven, CT
<http://info.med.yale.edu/eph/hpa>

District of Columbia

George Washington University, Washington, DC
<http://www.gwumc.edu/sphhs/hsml>

Georgetown University, Washington, DC
<http://nhs.georgetown.edu/healthsystems/dept.html>

Florida

Barry University, Miami Shores, FL <http://www.barry.edu/hsa>

Florida International University, Miami, FL
<http://chua2.fiu.edu/hsa>

University of Central Florida, Orland, FL
<http://www.cohpa.ucf.edu/health.pro/hsams.cfm>

University of Florida, Gainesville, FL
<http://www.phhp.ufl.edu/hsrmp>

University of Miami, Coral Gables, FL
<http://www.miami.edu/grad>

University of North Florida, Jacksonville, FL
<http://www.unf.edu/coh/mha.htm>

University of South Florida, Tampa, FL
<http://www.publichealth.usf.edu/hpm>

Georgia

Armstrong Atlantic State University, Savannah, GA
<http://www.healthscience.armstrong.edu>

Georgia State University, Atlanta, GA
<http://robinson.gsu.edu/healthadmin>

Illinois

Governors State University, University Park, IL
<http://www.govst.edu/ha>

Northwestern University, Chicago, IL
<http://www.kellogg.northwestern.edu/academic/health>,

Rush University, Chicago, IL <http://www.rushu.rush.edu/hsm>

University of Illinois at Chicago, Chicago, IL
<http://www.uic.edu/sph/mha>

Indiana

Indiana University, Indianapolis, IN <http://www.mha.iupui.edu>

Iowa

Des Moines University, Des Moines, IA
<http://www.dmu.edu/mha>

University of Iowa, Iowa City, IA
<http://www.public-health.uiowa.edu/hmp>

Kansas

University of Kansas Medical Center, Kansas City, KS
<http://www.kumc.edu/som/hpm>

Kentucky

University of Kentucky, Lexington, KY
<http://www-martin.uky.edu/~web/programs/mha/mha.html>

Western Kentucky University, Bowling Green, KY
<http://www.wku.edu/health/graduate.php>

Louisiana

Tulane University, New Orleans, LA <http://www.hsm.tulane.edu>

Maine

University of Southern Maine, Portland, ME
<https://muskie.usm.maine.edu/academics/hpm.jsp>

Maryland

Johns Hopkins University, Baltimore, MD
<http://www.jhsph.edu/Dept/HPM>

Massachusetts

Boston University, Boston, MA
<http://management.bu.edu/gpo/fulltime/hsm>

Simmons College, Boston, MA
<http://www.simmons.edu/shs/academics/hca/degrees.shtml>

Suffolk University, Boston, MA <http://www.suffolk.edu>

Michigan

University of Michigan, Ann Arbor, MI
<http://www.sph.umich.edu/hmp>

Minnesota

Capella University, Minneapolis, MN http://www.capella.edu/schools_programs/human_services/masters/health_management_policy.aspx

University of Minnesota, Minneapolis, MN
<http://www.hsr.umn.edu/mha>

Missouri

St. Louis University, St. Louis, MO
http://publichealth.slu.edu/hmp_department.htm

University of Missouri Columbia, MO
<http://www.hmi.missouri.edu>

Washington University, St. Louis, St. Louis, MO
<http://hap.wustl.edu>

Nebraska

Bellevue University, Omaha, NE
http://www.bellevue.edu/degrees/mshca_new.asp

New Jersey

Seton Hall University, South Orange, NJ
<http://artsci.shu.edu/gdpha>

New York

Baruch College and Mt. Sinai School of Medicine, New York, NY
<http://www.healthcaremba.org>

Columbia University, New York, NY
<http://www.mailman.hs.columbia.edu/hpm>

Cornell University, Ithaca, NY
<http://www.sloan.cornell.edu>

Hofstra University, Hempstead, NY
<http://www.hofstra.edu/mha>

New York University, New York, NY
<http://wagner.nyu.edu>

Union Graduate College, Schenectady, NY
<http://www.uniongraduatecollege.edu/pages/schools/management/degreePr02.asp>

University of Rochester, Rochester, NY
<http://www.simon.rochester.edu/centers/HCM.aspx>

North Carolina

University of North Carolina at Chapel Hill, Chapel Hill, NC
<http://www.sph.unc.edu/hpaa>

University of North Carolina at Charlotte, Charlotte, NC
<http://www.health.uncc.edu>

Ohio

Cleveland State University, Cleveland, OH
<http://www.csuohio.edu/cba/mba>

Ohio State University, Columbus, OH
<http://sph.osu.edu/hsmpr>

Xavier University, Cincinnati, OH
<http://www.xavier.edu/mhsa>

Oklahoma

University of Oklahoma, Oklahoma City, OK
<http://www.ou.edu>

Pennsylvania

Kings College, Wilkes Barre, PA
<http://departments.kings.edu/hca/index.htm>

Pennsylvania State University, University Park, PA
<http://www.hhdev.psu.edu/hpa>

Temple University, Philadelphia, PA
<http://sbm.temple.edu/dept/rihm/healthcare/grad-hm.html>

University of Pittsburgh, Pittsburgh, PA
<http://www.hpm.pitt.edu>

University of Scranton, Scranton, PA
<http://academic.scranton.edu/department/HAHR/mha>

South Carolina

Medical University of South Carolina, Charleston, SC
<http://www.musc.edu/chp/mha>

University of South Carolina, Columbia, SC
<http://hsph.sph.sc.edu>

Tennessee

University of Memphis, Memphis, TN
<http://healthadmin.memphis.edu>

Texas

Army-Baylor University, Ft. Sam Houston, TX
<http://www.baylor.edu/graduate/mha/index.php>

Baylor University, Waco, TX
<http://www.baylor.edu/business/mba/index.php?id=4596>

Midwestern State University, Wichita Falls, TX
<http://hs2.mwsu.edu/healthandpublic>

Texas A&M University System, College Station, TX
<http://www.srph.tamhsc.edu>

Texas Southern University, Houston, TX
<http://www.tsu.edu/academics/pharmacy/program/admin.asp>

Texas State University, San Marcos, San Marcos, TX
<http://www.health.txstate.edu/HA>

Texas Tech University, Lubbock, TX
<http://www.hom.ba.ttu.edu>

Texas Woman's University, Houston, TX
<http://www.twu.edu/hs/h-hca>

Trinity University, San Antonio, TX
<http://www.trinity.edu/departments/healthcare>

University of Houston, Clear Lake, Houston, TX
<http://www.uhcl.edu>

University of North Texas, Fort Worth, TX
<http://www.hsc.unt.edu>

University of Texas at Arlington, Fort Worth, TX
<http://www2.uta.edu/gradbiz/HealthAdmin>

Virginia

George Mason University, Fairfax, VA <http://chhs.gmu.edu/HealthAdministrationPolicyDepartment/index.html>

Marymount University, Arlington, VA
<http://marymount.edu/academic/business/lahcm/mshcm.html>

Virginia Commonwealth University, Richmond, VA
<http://www.had.vcu.edu>

Washington

University of Washington, Seattle, WA
<http://depts.washington.edu/mhap>

Washington State University, Spokane, WA
<http://www.hpa.spokane.wsu.edu>

See also Health Administration, Association of Academic Programs of

82. Health Disparities

Health disparities are the gaps in healthcare across racial or ethnic groups and/or socioeconomic status. These disparities may be in terms of access to healthcare, health outcomes, or in the occurrence of disease.

National Center on Minority Health and Health Disparities (NCMHD) (This center was formed as part of NIH in 1993) <http://www.ncmhd.nih.gov>

National Healthcare Disparities Report
<http://www.ahrq.gov/qual/measurix.htm#quality>

Office of Minority Health
<http://www.omhrc.gov>

See also Healthy People 2010; Minority Health; Uninsured Individuals

83. Health Economics, Academic Centers of

Academic centers of health economics apply economic principles and techniques to health policy analysis and work to improve the efficiency of the healthcare system.

Center for Health Economics (CHE), Monash University, Australia <http://www.buseco.monash.edu.au/Centres/che>

Center for Health Economics (CHE), University of York, United Kingdom <http://www.york.ac.uk/inst/che>

Center for Health Economics and Policy Analysis (CHEPA), McMaster University, Canada <http://www.chepa.org>

Center for Health Economics Research and Evaluation (CHERE), University of Technology, Sydney, Australia <http://www.chere.uts.edu.au>

Health Economics Research Center (HERC), University of Oxford, United Kingdom <http://www.herc.ox.ac.uk>

Health Economics Research Program (HERO), University of Oslo, Norway <http://www.hero.uio.no>

Institute of Health Economics (Canada) <http://www.ihe.ab.ca>

Leonard Davis Institute of Health Economics (LDI), University of Pennsylvania <http://www.upenn.edu/ldi>

See also Health Economics, Associations of; Pharmacoeconomics

84. Health Economics, Associations of

Associations of health economics serve as a venue for health economists to share research findings and as a forum to discuss health economic applications to health and the healthcare system.

Canadian Health Economics Research Association (CHERA) <http://www.chera.ca>

International Health Economics Association (iHEA)/American Society of Health Economists (ASHE)
<http://www.healthconomics.org>

See also Health Economics, Academic Centers of; Pharmacoeconomics

85. Health Insurance

Health insurance is a form of insurance that covers healthcare-related expenses. Health benefits refers to the specific services and procedures that are covered by the health insurance plan.

American Academy of Actuaries <http://www.actuary.org>

American Benefits Council
<http://www.americanbenefitscouncil.org>

America's Health Insurance Plans (AHIP) (AHIP was formed in late 2003 following the merger of the American Association of Health Plans and the Health Insurance Association of America.) <http://www.ahip.org>

Blue Cross and Blue Shield Association (BCBSA)
<http://www.bluecares.com>

Canadian Association of Blue Cross Plans (CABCP)
<http://www.bluecross.ca>

Canadian Life and Health Insurance Association (CLHIA) <http://www.clhia.ca>

Employee Benefit Research Institute (EBRI) <http://www.ebri.org>

Health Benefits Advisor, U.S. Department of Labor <http://www.dol.gov/elaws/ebsa/health>

Health Benefits Coalition for Affordable Choice and Quality <http://www.hbcweb.com>

International Federation of Health Plans (IFHP) <http://www.ifhp.com>

National Academy of Social Insurance (NASI) <http://www.nasi.org>

Pharmacy Benefit Management Institute (PBMI) <http://www.pbmi.com>

See also Health Disparities; Healthcare Financial Management; Medicaid; Medicare; Uninsured Individuals

86. Health Insurance Portability and Accountability Act of 1996 (HIPAA)

Health Insurance Portability and Accountability Act refers to legislation that was passed in 1996 that protects the health insurance coverage of workers and their families who lose or change their jobs. This law also sets up requirements for national standards of electronic healthcare transactions as well as the security and privacy of health data.

Centers for Medicare and Medicaid Services (CMS) <http://www.cms.hhs.gov/HIPAAGenInfo>

HIPAA Advisory, Phoenix Health Systems <http://www.hipaadvisory.com>

HIPAA.org <http://www.hipaa.org>

Office of Civil Rights <http://www.hhs.gov/ocr/hipaa>

See also Federal Government; Health Insurance; Health Law; Regulation

87. Health Law

Health law refers to the laws, rules, and regulations that affect the healthcare system or the providers, payers, suppliers, and consumers of the system.

American College of Legal Medicine (ACLM) <http://www.aclm.org>

American Health Lawyers Association (AHLA) <http://www.healthlawyers.org>

American Society of Law, Medicine, and Ethics (ASLME) <http://www.aslme.org>

Center for Health Care Rights (CHCR) <http://www.healthcarerights.org>

Center for Medicare and Medicaid Services (CMS) Regulations and Guidance <http://www.cms.hhs.gov/home/regsguidance.asp>

Health Law, Findlaw <http://www.findlaw.com/01topics/19health/index.html>

Health Law Section, American Bar Association (ABA) <http://www.abanet.org/health>

Legal Information Institute, Cornell Law School, Ithaca, New York <http://www.law.cornell.edu/topics/health.html>

National Senior Citizens Law Center (NSCLC) <http://www.nsclc.org>

Office of Civil Rights, Department of Health and Human Services (HHS) <http://www.hhs.gov/ocr>

Washburn Law Library, Washburn University School of Law, Topeka, Kansas <http://www.washlaw.edu>

See also Ethics; Fraud and Abuse; Health Insurance Portability and Accountability Act of 1996 (HIPAA); Regulation

88. Health Libraries and Information Centers

Health libraries and information centers serve as repositories for resources that include books, journals, reports, and other reference material on medicine and health.

American Hospital Association's Resource Center (AHA) <http://www.aha.org/aha/resource-center/index.html>

Association of Academic Health Sciences Libraries (AAHSL) <http://www.aaahsl.org>

Canadian Health Libraries Association (CHLA) <http://www.chla-absc.ca>

Canadian Library Gateway <http://www.collectionscanada.ca/gateway/index-e.html>

Cochrane Library <http://www.cochrane.co.uk>

Environmental Protection Agency (EPA) Headquarters Repository Services <http://www.epa.gov/natlibra/hqirc>

Federal Citizen Information Center <http://www.pueblo.gsa.gov>

Food and Nutrition Information Center <http://www.nal.usda.gov/fnic>

Genetic and Rare Diseases Information Center <http://www.genome.gov/10000409>

Health and Social Care Information Centre, United Kingdom's National Health Service (NHS) <http://www.ic.nhs.uk>

Health Resources and Services Administration (HRSA)
Information Center <http://www.ask.hrsa.gov>

Library of Congress (LOC) <http://www.loc.gov>

Maternal and Child Health Information Resource
Center <http://mchb.hrsa.gov/mchirc>

Maternal and Child Health Library
<http://www.mchlibrary.info>

Medical Library Association (MLA) <http://www.mlanet.org>

National Child Care Information Center <http://nccic.org>

National Electronic Library for Health, United Kingdom's
National Health Service (NHS) <http://www.library.nhs.uk>

National Health Information Center (NHIC)
<http://www.health.gov/nhic>

National Heart, Lung, and Blood Institute Health Information
Center <http://www.nhlbi.nih.gov>

National Information Center on Health Services Research and
Health Care Technology (NICHSR)
<http://www.nlm.nih.gov/nichsr>

National Institute on Aging Information Center
<http://www.nia.nih.gov>

National Library of Medicine (NLM) <http://www.nlm.nih.gov>

WHO Library and Information Networks for Knowledge
(LNK) <http://www.who.int/library>

See also Federal Health Information Centers and
Clearinghouses; Health Services Research Journals; Journals,
Medical; News Services

89. Health Literacy

Health literacy is the ability of individuals to obtain, process, and understand health information and form appropriate healthcare decisions.

American Medical Association Foundation (AMAF)
<http://www.ama-assn.org>

Ask Me 3 <http://www.askme3.org>

National Institute for Literacy <http://www.nifl.gov>

Roundtable on Health Literacy, Institute of Medicine (IOM) of
the National Academies
<http://www.iom.edu/CMS/3793/31487.aspx>

See also Aging; Minority Health; Patient Safety; Quality of
Healthcare

90. Health Maintenance Organizations (HMO)

See Managed Care

91. Health Outcomes

Health outcomes are the end results of healthcare; they include a patient's health status, well-being, and satisfaction with healthcare.

Center for Health Policy/Center for Primary Care and Outcomes
Research (PCOR/CHP), School of Medicine, Stanford
University, Stanford, CA <http://chppcor.stanford.edu>

Health Outcomes Core Library Recommendations, 2004
<http://www.nlm.nih.gov/nichsr/corelib/houtcomes.html>

Health Outcomes Resource Center <http://medconsult.com>

See also Evidence-Based Medicine (EBM); Health Report Cards;
Quality of Healthcare

92. Health Planning

Health planning includes the strategic process of allocating and utilizing resources to meet the healthcare needs of a community.

American Health Planning Association (AHPA)
<http://www.ahpanet.org>

Policy Information Center, Office of the Assistant Secretary for
Planning and Evaluation, Department of Health and Human
Services (HHS) <http://aspe.hhs.gov/pic>

Prairie Region Health Promotion Research Centre
(Canada) <http://www.usask.ca/healthsci/che/prhprc>

Western Canada Waiting List Project <http://www.wcwl.org>

See also Certificate of Need (CON); Health Law; Hospitals;
Public Health; Regulation

93. Health Policy, Academic Centers of

Academic centers of health policy focus on examining policy issues that improve the practice and delivery of healthcare.

Center for Health and Public Policy Studies (CHPPS), School of
Public Health, University of California, Berkeley, CA
<http://chpps.berkeley.edu>

Center for Health and Public Service Research (CHPSR), Robert F. Wagner Graduate School of Public Service, New York University, New York, NY
<http://www.nyu.edu/wagner/chpsr>

Center for Health Policy and Primary Care Outcomes Research (CHPPCOR), Stanford University, Stanford, CA
<http://chppcor.stanford.edu>

Center for Health Policy, Duke University, Durham, NC
<http://www.hpolicy.duke.edu>

Center for Health Policy Research, School of Public Health, University of California, Los Angeles, CA
<http://www.healthpolicy.ucla.edu>

Center for Medical Ethics and Health Policy, Baylor College of Medicine, Houston, TX
<http://bcm.edu/ethics>

Children's Health Policy Centre, Simon Fraser University, Vancouver, BC (Canada)
<http://www.childhealthpolicy.sfu.ca>

Department of Health Management and Policy, School of Public Health, University of Michigan, Ann Arbor, MI
<http://www.sph.umich.edu/hmp>

Department of Health Policy, Thomas Jefferson University, Philadelphia, PA
<http://www.jefferson.edu/dhp>

Department of Health Policy and Management, School of Public Health, Columbia University, New York, NY
<http://cpmcnet.columbia.edu/dept/sph/hpm/index.html>

Department of Health Policy and Management, School of Public Health, Harvard University, Boston, MA
<http://www.hsph.harvard.edu/Academics/hpm>

Health Policy Institute, Georgetown Public Policy Institute
<http://ihcrp.georgetown.edu>

Health Policy, University of the Sciences in Philadelphia, PA
<http://www.healthpolicy.usip.edu>

Health Policy Institute, School of Public Health, University of Pittsburgh, PA
<http://www.healthpolicyinstitute.pitt.edu>

Institute for Child Health Policy (ICHP), University of Florida, Gainesville, FL
<http://www.ichp.ufl.edu>

Institute for Health Research and Policy, University of Illinois at Chicago, Chicago, IL
<http://ihrp.uic.edu>

Manitoba Centre for Health Policy, University of Manitoba, Winnipeg, MB (Canada)
<http://umanitoba.ca/medicine/units/mchp>

National Health Policy Forum (NHPF), George Washington University, Washington, DC
<http://www.nhpf.org>

Population Health Institute, University of Wisconsin, Madison, WI
<http://www.pophealth.wisc.edu/uwphi>

Women's and Children's Health Policy Center (WCHPC), School of Public Health, Johns Hopkins University, Baltimore, MD
<http://www.jhsph.edu/wchpc>

See also Advocacy, Education, and Research Organizations; Health Policy Organizations; Public Health

94. Health Policy Organizations

Health policy organizations conduct research into issues that affect the healthcare system and delivery of care.

American Enterprise Institute (AEI) for Public Policy Research
<http://www.aei.org>

Brookings Institution (BI)
<http://www.brookings.edu>

Canadian Policy Research Networks (CPRN)
<http://www.cprn.org>

Center for Health Policy Studies, Heritage Foundation
<http://www.heritage.org>

Center for Studying Health System Change (HSC)
<http://www.hschange.com>

Coalition for Evidence-Based Policy
<http://www.excelgov.org/Programs/ProgramDetail.cfm?ItemNumber=9711>

Commonwealth Fund
<http://www.commonwealthfund.org>

Dialogue on Health Reform (Canada)
<http://www.utoronto.ca/hpme/dhr/index.html>

Galen Institute
<http://www.galen.org>

Health Council of Canada
<http://www.healthcouncilcanada.ca>

Heritage Foundation
<http://www.heritage.org>

Institute of Medicine (IOM)
<http://www.iom.edu>

Henry J. Kaiser Family Foundation (KFF)
<http://www.kaisernetwork.org>

Mathematica Policy Research, Inc.
<http://www.mathematica-mpr.com/index.htm>

National Health Policy Forum
<http://www.nhpf.org>

Office of Rural Health Policy, Health Resources and Services Administration (HRSA)
<http://ruralhealth.hrsa.gov>

Pew Charitable Trusts
<http://www.pewtrusts.org>

Policy Information Center, Office of the Assistant Secretary for Planning and Evaluation, Department of Health and Human Services (HHS)
<http://aspe.hhs.gov/pic>

RAND Corporation
<http://www.rand.org>

Urban Institute
<http://www.urban.org>

See also Advocacy, Education, and Research Organizations; Foundation and Philanthropies; Health Policy, Academic Centers of; Public Health

95. Health Report Cards

Quality performance indicators is a type of metric that is used to assist healthcare organizations evaluate if they are meeting healthcare quality goals and objectives.

Agency for Health Care Research and Quality (AHRQ)
<http://www.ahrq.gov>

Health Grades, Inc. <http://www.healthgrades.com>

Health Plan Employer Data and Information Set (HEDIS),
 National Committee for Quality Assurance (NCQA)
<http://web.ncqa.org/tabid/59/Default.aspx>

Hospital Compare, Hospital Quality Alliance (HQA)
<http://www.hospitalcompare.hhs.gov>

Medical Outcomes Trust <http://www.outcomes-trust.org>

National Centre for Health Outcomes Development
 (NCHOD) <http://www.nchod.nhs.uk>

Performance Data, Department of Health
<http://www.performance.doh.gov.uk>

Quality Check, Joint Commission http://www.jointcommission.org/qualitycheck/06_about_qc.htm

U.S. News and World Report Best Hospitals
<http://www.usnews.com/besthospitals>

See also Centers for Medicare and Medicaid Services (CMS);
 Health Outcomes; Hospitals; Nursing Homes; Physicians;
 Quality of Healthcare

96. Health Services Research, Academic and Training Centers of

Academic and training centers of health services research provide training to develop professionals and researchers with a background in health services research and health policy.

Case Western Reserve University School of Medicine,
 Cleveland, OH <http://mediswww.meds.cwru.edu>

Cecil G. Sheps Center for Health Services Research, University
 of North Carolina, Chapel Hill, NC
<http://www.schr.unc.edu>

Center for Health Care Research and Department of Biometry
 and Epidemiology, Medical University of South Carolina,
 Charleston, SC <http://www.musc.edu/chr>

Center for Health Policy/Center for Primary Care and
 Outcomes Research (PCOR/CHP), School of Medicine,
 Stanford University, Stanford, CA
<http://chppcor.stanford.edu>

Center for Gerontology and Health Care Research, Brown
 University, Providence, RI <http://www.chcr.brown.edu>

Centre for Health Services and Policy Research, Queens
 University, Kingston, Ontario (Canada)
<http://chspr.queensu.ca>

Centre for Health Services and Policy Research, University of
 British Columbia, Vancouver, BC (Canada)
<http://www.chspr.ubc.ca>

Center for Health Services Research and Policy, George
 Washington University, Washington, DC
<http://www.gwumc.edu/sphhs/healthpolicy>

Center for Outcomes and Effectiveness Research and Education,
 University of Alabama at Birmingham, Birmingham,
 AL <http://www.dopm.uab.edu/coere/index.html>

Chicago Department of Health Studies, University of Chicago,
 Chicago, IL <http://harrisschool.uchicago.edu>

Cornell University Weill Medical College, New York, NY
<http://www.cornellmedicine.com>

Dartmouth Medical School, Hanover, NH
<http://www.dartmouth.edu/~cecs>

Department of Community and Preventive Medicine, University
 of Rochester, Rochester, NY
<http://www.urmc.rochester.edu/cpm>

Department of Health Services, University of Washington,
 Seattle, WA <http://depts.washington.edu/hserv>

Department of Population Health Sciences, School of Medicine,
 University of Wisconsin, Madison, Madison, WI
<http://www.pophealth.wisc.edu/HSR/traininggrant.htm>

Institute for Clinical Research and Health Policy Studies
 (ICRHPS), Tufts Medical Center, Boston, MA
<http://160.109.101.132/icrhps/default.asp>

Duke University Center for Clinical Health Policy Research
 (CCHPR), Durham, NC
<http://www.ahrq.gov/clinic/epc/dukeepc.htm>

Harvard Medical School, Boston MA
<http://web.hms.harvard.edu/hfdfp/research.htm>

Health Services Research and Development Center, School of
 Public Health, Johns Hopkins University
<http://www.jhsph.edu/HSR/index.html>

Institute for Health Services Research and Policy Studies
 (IHSRPS), Northwestern University Feinberg School of
 Medicine, Chicago, IL
<http://www.medschool.northwestern.edu/ihs>

Institute of Gerontology, Wayne State University, Detroit,
 MI <http://www.iog.wayne.edu>

Leonard Davis Institute, The Wharton School, University of
 Pennsylvania, Philadelphia, PA <http://www.wharton.upenn.edu/doctoral/programs/healthcare>

Schneider Institute for Health Policy, Heller School of Social Policy and Management, Brandeis University, Waltham, MA <http://www.sihp.brandeis.edu>

School of Public Health and Public Policy, University of California, Berkeley, and School of Medicine, University of California, San Francisco <http://ihps.medschool.ucsf.edu>

School of Public Health, University of California, Los Angeles/RAND Corporation, Los Angeles, CA <http://www.ph.ucla.edu/hs/degree.html>

School of Public Health, University of Michigan, Ann Arbor, MI <http://www.sph.umich.edu/hmp/programs>

School of Public Health, University of Minnesota, Minneapolis, MN <http://www.hsr.umn.edu>

Vanderbilt University, Nashville, TN <http://www.mc.vanderbilt.edu/prevmed/mp>

See also Health Services Research, Associations and Foundations of

97. Health Services Research, Associations and Foundations of

Associations and foundations of health services research are dedicated groups of health services researchers, health policy experts, and practitioners who work to advance research, policy, and practice in the field.

AcademyHealth (Established in 2000 following the merger between the Alpha Center and the Association for Health Services Research (AHSR) <http://www.academyhealth.org>

American Health Care Association (AHCA), Research and Data http://www.ahcancal.org/research_data/Pages/default.aspx

Canadian Association for Health Services and Policy Research (CAHSPR) <http://www.cahspr.ca>

Canadian Health Services Research Foundation (CHSRF) <http://www.chsrf.ca>

Health Services Research Association of Australia and New Zealand (HSRAANZ) <http://www.chere.uts.edu.au/hsraanz>

See also Health Policy Organizations; Health Services Research, Academic and Training Centers of

98. Health Services Research, History of

History of health services research includes the background, stories, and experiences of key leaders and scholars of this growing field.

National Information Center on Health Services Research and Health Care Technology (NICHSR) (NICHSR conducted a History of Health Services Research Project that interviewed many prominent health services researchers) <http://www.nlm.nih.gov/nichsr>

See also Federal Government; Health Policy Organizations

99. Health Services Research Journals

Health services research journals are peer-reviewed publications that publish original and innovative work that advances the field of health services and improves the health of individuals.

American Journal of Public Health <http://www.ajph.org>

Forum for Health Economics and Policy <http://www.bepress.com/fhep>

Health Affairs <http://www.healthaffairs.org>

Health Care Financing Review <http://www.cms.hhs.gov/HealthCareFinancingReview>

Health Economics <http://www3.interscience.wiley.com>

Health Services Research <http://hsr.org>

Inquiry: The Journal of Health Care Organization, Provision, and Financing <http://www.inquiryjournal.org>

Journal of Health Economics http://www.elsevier.com/wps/find/journaldescription.cws_home/505560/description

Journal of Health Politics, Policy and Law <http://jhpl.dukejournals.org>

Journal of Health Services Research and Policy <http://www.rsmppress.co.uk/jhsrp.htm>

Medical Care <http://www.lww-medicalcare.com>

Medical Care Research and Review <http://mcr.sagepub.com>

Milbank Quarterly <http://www.milbank.org/quarterly.html>

Research in Healthcare Financial Management <http://www.rhfm.org>

See also Journals, Medical; News Services

100. Health Statistics and Data Sources

Sources of health statistics and data include places where researchers, policymakers, and the public can turn to to obtain information on health, disease, and mortality.

- Agency for Healthcare Research and Quality (AHRQ)
<http://www.ahrq.gov>
- American Hospital Association (AHA) (Conducts an annual survey of the nation's hospitals) <http://www.aha.org>
- American Medical Association (AMA)
<http://www.ama-assn.org>
- Area Resource File (ARF): National County-level Health Resource Information Database (The ARF contains population and health data for each county in the United States) <http://www.arfsys.com>
- Bureau of Health Professions (BHPr), Health Resources and Services Administration (HRSA) <http://bhpr.hrsa.gov>
- Canadian Institute for Health Information (CIHI)
<http://www.cihi.ca>
- Centers for Medicare and Medicaid Services (CMS)
<http://www.cms.hhs.gov>
- Department of Veterans Affairs (VA) <http://www.va.gov>
- Health Statistics, Statistics Canada <http://cansim2.statcan.ca>
- Hospital Episodes Statistics, United Kingdom's National Health Service <http://www.dh.gov.uk/PublicationsAndStatistics/Statistics/HospitalEpisodeStatistics/en>
- National Association of Health Data Organizations (NAHDO)
<http://www.nahdo.org>
- National Center for Health Statistics (NCHS)
<http://www.cdc.gov/nchs>
- Pan American Health Organization (PAHO)
<http://www.paho.org>
- Statistical Abstract of the United States
<http://www.census.gov/statab/www>
- Statistics Canada <http://www.statcan.ca>
- U.S. Census Bureau <http://www.census.gov>
- World Health Organization Statistical Information System <http://www.who.int/whosis>
- See also* Centers for Disease Control and Prevention (CDC); Health Surveys; State and County Data Sources; Vital Statistics; World Health Organization (WHO)
- ### 101. Health Surveys
- Health surveys include questionnaires that are conducted across the nation to assess different aspects of health, healthcare, or demographics.
- Annual Health Care and Social Assistance Survey (NAICS 62), U.S. Census (NAICS stands for North American Industry Classification System) <http://www.census.gov/svsd/www/sas62.html>
- Annual Survey of Hospitals, American Hospital Association (AHA) <http://www.aha.org/aha/resource-center/Statistics-and-Studies/index.html>
- Healthcare Cost and Utilization Project (HCUP)
<http://www.ahrq.gov/data/hcup>
- Inter-University Consortium for Political and Social Research (ICPSR), Institute for Social Research, University of Michigan <http://www.icpsr.umich.edu/org/index.html>
- Longitudinal Studies of Aging (LSOA)
<http://www.cdc.gov/nchs/lsoa.htm>
- Medical Expenditure Panel Survey (MEPS)
<http://www.ahrq.gov/data/mepsix.htm>
- National Ambulatory Medical Care Survey (NAMCS)
<http://www.cdc.gov/nchs/about/major/ahcd/ahcd1.htm>
- National Employer Health Insurance Survey (NEHIS)
<http://www.cdc.gov/nchs/about/major/nehis/nehis.htm>
- National Health and Nutrition Examination Survey (NHANES)
<http://www.cdc.gov/nchs/nhanes.htm>
- National Health Care Survey (NHCS)
<http://www.cdc.gov/nchs/nhcs.htm>
- National Health Interview Surveys (NHIS)
<http://www.cdc.gov/nchs/nhis.htm>
- National Health Provider Inventory (NHPI) Public-Use Data Files http://www.cdc.gov/nchs/products/elec_prods/subject/nhpi.htm
- National Home and Hospice Care Survey (NHHCS)
<http://www.cdc.gov/nchs/nhhcs.htm>
- National Hospital Ambulatory Medical Care Survey (NHAMCS)
<http://www.cdc.gov/nchs/about/major/ahcd/ahcd1.htm>
- National Hospital Discharge and Ambulatory Surgery Survey (NHDS) <http://www.cdc.gov/nchs/about/major/hdasd/nhds.htm>
- National Immunization Survey (NIS) <http://www.cdc.gov/nis>
- National Medical Expenditures Survey (NMES)
http://wonder.cdc.gov/wonder/sci_data/surveys/nmes/nmes.asp
- National Nursing Home Survey (NNHS)
<http://www.cdc.gov/nchs/nnhs.htm>
- National Survey of Ambulatory Surgery (NSAS)
<http://www.cdc.gov/nchs/nsas.htm>
- National Survey of Family Growth (NSFG)
<http://www.cdc.gov/nchs/nsfg.htm>
- Service Annual Survey, Health Care and Social Assistance (NAICS 62), U.S. Census Bureau (NAICS stands for the North American Industry Classification System)
<http://www.census.gov/econ/www/servmenu.html>
- See also* Centers for Disease Control and Prevention (CDC); Health Statistics and Data Sources; Public Health; State and County Data Sources

102. Healthcare Administration and Management

Healthcare administration and management includes professionals who work to ensure the smooth and functional operation of a healthcare facility or system.

American College of Healthcare Executives (ACHE)
<http://www.ache.org>

American College of Physician Executives (ACPE)
<http://www.acpe.org>

Canadian College of Health Service Executives (CCHSE)
<http://www.cchse.org>

Healthcare Financial Management Association (HFMA)
<http://www.hfma.org>

European Healthcare Management Association (EHMA)
<http://www.ehma.org>

Management Sciences for Health <http://www.msh.org>

National Institute for Health Care Management (NIHCM)
<http://www.nihcm.org>

See also Health Administration, Association of Academic Programs of; Health Administration Programs, Graduate Programs in

103. Healthcare Financial Management

Healthcare financial management is the technique of using fiscally responsible standards and practices to run a healthcare organization.

Changes in Health Care Financing and Organizations (This program is part of AcademyHealth) <http://www.hcfo.net>

Healthcare Financial Management Association (HFMA)
<http://www.hfma.org>

International Society for Research in Healthcare Financial Management (isRHFm) <http://www.rhfm.org>

See also Centers for Medicare and Medicaid Services (CMS); Health Insurance; Medicaid; Medical Billing; Medical Records; Medicare; Regulation

104. Healthy People 2010

Healthy People 2010 is the set of the nation's objectives to identify the most preventable threats to the country's health and to create goals to reduce and eliminate these threats.

Healthy People 2010 <http://www.healthypeople.gov>

See also Federal Government; Health Disparities; Minority Health; Public Health

105. Heart Disease

Heart disease refers to a number of diseases that relate to the heart. Heart disease remains one of the leading causes of death in the United States.

American Heart Association (AHA)
<http://www.americanheart.org>

Canadian Adult Congenital Heart Network
<http://www.cachnet.org>

Congenital Heart Information Network (CHIN)
<http://tchin.org>

Heart Rhythm Society <http://www.hrsonline.org>

National Heart, Lung, and Blood Institute (NHLBI)
<http://www.nhlbi.nih.gov>

See also Cardiology; Chronic Diseases; Emergency Medicine; Hospitals

106. Hispanic

Hispanic refers to the heterogenous groups of people and cultures who speak Spanish and were once ruled by Spain.

Association of Hispanic Healthcare Executives (AHHE)
<http://www.ahhe.org>

National Alliance for Hispanic Health (NAHH)
<http://www.hispanichealth.org>

National Association of Hispanic Nurses (NAHN)
<http://thehispanicnurses.org>

National Council on La Raza <http://www.nclr.org>

National Hispanic Council on Aging (NHCOA)
<http://www.nhcoa.org>

National Hispanic Medical Association (NHMA)
<http://www.nhmamd.org>

Office of Minority Health Resource Center
<http://www.omhrc.gov>

See also Health Disparities; Migrant Health; Minority Health; Rural Health

107. Home Health Care

Home health care is a type of care provided to allow seniors with health conditions to live as independently as possible. Home health care may involve therapy, nursing, and assistance with daily living.

Canadian Home Care Association (CHCA)
<http://www.cdnhomecare.ca>

National Association for Home Care and Hospice (NAHC)
<http://www.nahc.org>

Team in Community Care and Health Human Resources
<http://teamgrant.ca>

United Kingdom Home Care Association
<http://www.ukhca.co.uk>

See also Aging; Assisted Living; Disability; Nursing

108. Hospice and Palliative Care

Hospice and palliative care is the specialized comfort care provided to individuals with terminal conditions to alleviate pain and suffering.

Association for Death Education and Counseling (ADEC)
<http://www.adecc.org>

Children's Hospice International (CHI)
<http://www.chionline.org>

Hospice Association of America (HAA)
<http://www.nahc.org/haa>

Hospice Education Institute <http://www.hospiceworld.org>

International Association for Hospice and Palliative Care (IAHPC) <http://www.hospicecare.com>

National Association for Home Care and Hospice (NAHC)
<http://www.nahc.org>

National Institute for Jewish Hospice <http://www.nijh.org>

See also Aging; Gerontology; Health Insurance; Nursing Homes

109. Hospital Infections and Nosocomial Diseases

Hospital infections are infections that are acquired secondarily to a patient's primary medical condition, and acquired during the course of a hospitalization.

National Nosocomial Infections Surveillance System
http://www.cdc.gov/ncidod/dhqp/nnis_pubs.html

See also Emerging Diseases; Hospitals; Infection Control and Prevention; Infectious Diseases; Public Health

110. Hospitalist

Hospitalists are physicians who specialize in the general medical care of hospitalized patients.

Society of Hospital Medicine (SHM)
<http://www.hospitalmedicine.org>

See also Hospitals; Quality of Healthcare

111. Hospitals

Hospitals are a type of healthcare institution that provides care to patients needing medical treatment. Hospitals house specialized medical equipment and staff and can accommodate patient stays.

American Hospital Association (AHA) (The AHA represents all of the nation's hospitals) <http://www.aha.org>

American Hospital Directory (AHD) <http://www.ahd.com>

Catholic Health Association of the United States (CHA)
<http://www.chausa.org>

Council of Teaching Hospitals and Health Systems (COTH)
<http://www.aamc.org>

Federation of American Hospitals (FAH) (FAH represents the nation's for-profit hospitals)
<http://www.americashospital.com>

HospitalWeb
<http://neuro-www.mgh.harvard.edu/hospitalweb.shtml>

National Association of Children's Hospitals and Related Institutions (NACHRI) <http://www.childrenshospitals.net>

National Association of Public Hospitals and Health Systems (NAPH) <http://www.naph.org>

National Ministries (This organization was formerly the American Baptist Homes and Hospitals Association)
<http://www.nationalministries.org>

U.S. News and World Report Best Hospitals
<http://www.usnews.com/besthospitals>

VHA: Voluntary Hospitals of America <http://www.vha.com>

Virtual Hospital: Information for Patients
<http://www.uihealthcare.com/vh>

See also Emergency Medicine; Hospital Infections and Nosocomial Diseases; Hospitalists; Physicians; Nursing

112. Hypertension

Hypertension, also known as high blood pressure, is when a person's blood pressure is chronically elevated.

American Society of Hypertension (ASH)
<http://www.ash-us.org>

International Society on Hypertension in Blacks (ISHIB)
<http://www.ishib.org>

Pulmonary Hypertension Association (PHA)
<http://www.phassociation.org>

World Hypertension League
<http://www.worldhypertensionleague.org>

See also Chronic Diseases; Heart Disease; Kidney Diseases; Public Health

113. Immunization and Vaccination

Immunization is when a person's immune system is protected against an agent and it is generally done by giving vaccinations.

Immunization Action Coalition (IAC)
<http://www.immunize.org>

Vaccines and Immunizations, CDC
<http://www.cdc.gov/vaccines>

See also Prevention and Health Promotion; Public Health

114. Infection Control and Prevention

Infection control and prevention is the process of protecting against and reducing the spread of disease within a healthcare setting.

Center for Infectious Disease Research and Policy (CIDRAP),
University of Minnesota
<http://www.cidrap.umn.edu/cidrap>

Infection Control Guidelines, Centers for Disease Control and
Prevention (CDC)
<http://www.cdc.gov/ncidod/dhqp/guidelines.html>

National Center for HIV, Viral Hepatitis, STD, and TB
Prevention (NCHHSTP) <http://www.cdc.gov/nchhstp>

Society for Healthcare Epidemiology of America (SHEA)
<http://www.shea-online.org>

See also Emerging Diseases; Hospital Infections and Nosocomial
Diseases; Infectious Diseases

115. Infectious Diseases

Infectious diseases are diseases that result from microbial pathogens. Infectious diseases may be spread through a number of ways including airborne transmission, food, liquids, bodily fluids, and vectors.

Center for Infectious Disease Research and Policy (CIDRAP),
University of Minnesota
<http://www.cidrap.umn.edu/cidrap>

Communicable Disease Review Weekly
<http://www.hpa.org.uk/cdr>

Infectious Diseases Society of America (IDSA)
<http://www.idsociety.org>

Morbidity and Mortality Weekly Report
<http://www.cdc.gov/mmwr>

National Institute of Allergy and Infectious Diseases (NIAID)
<http://www3.niaid.nih.gov>

Society of Infectious Diseases Pharmacists (SIDP)
<http://www.sidp.org>

See also Centers for Disease Control and Prevention (CDC);
Emerging Diseases; Hospital Infections and Nosocomial
Diseases; Infection Control and Prevention; Public Health

116. Influenza Pandemic

Influenza pandemic is an outbreak of the flu in which people have little to no natural immunity and for which no vaccine exists. An influenza pandemic would spread rapidly throughout the population and result in serious illness.

Pandemic Flu <http://www.pandemicflu.gov>

See also Centers for Disease Control and Prevention (CDC);
Disaster Preparedness and Relief; Emerging Diseases; Public
Health

117. Informatics

Informatics is the field of information science that includes information processing and the development of information technologies. Informatics is growing in its application to health and medicine.

American Medical Informatics Association (AMIA)
<http://www.amia.org>

Canada's Health Informatics Association (COACH)
<http://www.coachorg.com>

European Federation for Medical Informatics (EFMI)
<http://www.efmi.org>

Health Informatics New Zealand (HINZ)
<http://www.hinz.org.nz>

Health Informatics Society of Australia (NISA)
<http://www.hisa.org.au>

International Medical Informatics Association (IMIA)
<http://www.imia.org>

National Center for Public Health Informatics (NCPHI)
<http://www.cdc.gov/ncphi>

UK Health Informatics Society (UKHiS) <http://www.bmis.org>

See also E-Health; Information Technology (IT); Telemedicine

118. Information Technology (IT)

Information technology allows for the management and transmission of health data and information between providers and consumers.

Agency for Healthcare Research and Quality (AHRQ)
<http://www.ahrq.gov>

American Health Information Management Association (AHIMA) <http://www.ahima.org>

Commonwealth Fund <http://www.cmwf.org>

National Resource Center for Health Information Technology, Agency for Healthcare Research and Quality (AHRQ)
<http://www.ahrq.gov>

See also E-Health; Informatics; Telemedicine

119. Injury

Injury is bodily damage or harm caused to a structure or part of the body.

Injuries, Illnesses, and Fatalities Bureau of Labor Statistics, U.S. Department of Labor <http://www.bls.gov/iif>

Injury Control Resource Information Network
<http://www.injurycontrol.com/icrin>

National Center for Injury Prevention and Control (NCIPC), Centers for Disease Control and Prevention (CDC)
<http://www.cdc.gov/ncipc>

National Highway Traffic Safety Administration (NHTSA)
<http://www.nhtsa.dot.gov>

National Injury Information Clearinghouse
<http://www.cpsc.gov/about/clrnghse.html>

National Institute for Occupational Safety and Health (NIOSH), Centers for Disease Control and Prevention (CDC) <http://www.cdc.gov/niosh>

Public Health Agency of Canada, Injury
<http://www.phac-aspc.gc.ca/injury-bles>

World Health Organization (WHO) Violence and Injury Prevention
http://www.who.int/violence_injury_prevention/en

See also Burn Care; Emergency Medicine; Occupational Medicine; Workers' Compensation

120. Internal Medicine

Internal medicine is the speciality of medicine that is focused on the diagnosis, nonsurgical treatment, and management of serious or unusual medical conditions.

American Board of Internal Medicine (ABIM)
<http://www.abim.org>

American College of Physicians, American Society of Internal Medicine (ACP-ASIM) <http://www.acponline.org>

Society of General Internal Medicine (SGIM)
<http://www.sгим.org>

See also Hospitals; Physicians

121. International Health Systems

International health systems refers to the public health models used in various countries. Studying them often provides insight into a one's own healthcare system.

Academy for International Health Studies (AIHS)
<http://www.aihs.com>

American Association for World Health (AAWH)
<http://www.thebody.com/content/art33029.html>

Bill and Melinda Gates Foundation
<http://www.gatesfoundation.org>

Canadian Society for International Health (CSIH)
<http://www.csih.org>

Fogarty International Center (FIC), National Institutes of Health (NIH) <http://www.fic.nih.gov>

Global Health Council <http://www.globalhealth.org>

International Association for Medical Assistance to Travelers (IAMAT) <http://www.iamat.org>

Pan American Health Organization (PAHO)
<http://www.paho.org>

People-to-People Health Foundation (HOPE)
<http://www.projecthope.org>

Project Concern International (PCI)
<http://www.projectconcern.org>

Project HOPE <http://www.projecthope.org>

U.S. Agency for International Development (USAID)
<http://www.usaid.gov>

W. K. Kellogg Foundation <http://www.wkkf.org>

World Bank Group <http://www.worldbank.org>

World Health Organization (WHO) <http://www.who.int>

See also Canadian Healthcare Organizations; United Kingdom Healthcare Organizations; World Health Organization (WHO)

122. Journals, Medical

Medical journals are peer-reviewed publications that publish original work on recent health and medical findings.

British Medical Journal (BMJ) <http://www.bmj.com>
Free Medical Journals <http://www.freemedicaljournals.com>

Journal of Postgraduate Medicine
<http://www.jpjgmonline.com>

Journal of the American Medical Association
(JAMA) <http://jama.ama-assn.org>

New England Journal of Medicine (NEJM)
<http://www.nejm.org>

PubMed (The National Library of Medicine produces this huge database. It lists author, title, and summaries of medical journal articles.) <http://www.pubmed.gov>

See also Federal Health Information Centers and Clearinghouses; Health Services Research Journals; News Services

123. Kidney Diseases

Kidney diseases are conditions that affect the kidneys, the organ that is responsible for the removal of waste and fluids from the body. Kidney diseases can be acquired or heredity.

American Association of Kidney Patients (AAKP)
<http://www.aakp.org>

American Kidney Fund (AKF) <http://www.kidneyfund.org>

Kidney Transplant/Dialysis Association (KT/DA)
<http://www.ktda.org>

National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) <http://www2.niddk.nih.gov>

National Kidney Foundation (NKF) <http://www.kidney.org>

University Renal Research and Education Association
<http://www.ustransplant.org>

See also Donors and Transplantation; Hypertension; Nephrology

124. Latino

See Hispanic

125. Liver Diseases

Liver diseases are conditions that affect the liver, which is responsible for many functions including metabolizing toxic substances, converting nutrients, storing minerals, synthesizing proteins and enzymes, and maintaining hormone levels.

American Association for the Study of Liver Diseases (AASLD) <http://www.aasld.org>

American Liver Foundation (ALF)
<http://www.liverfoundation.org>

Hepatitis Foundation International <http://www.hepfi.org>

See also Donors and Organ Transplantation; Internal Medicine

126. Long-Term Care

Long-term care is the care that is provided to the chronically ill and disabled. Long-term care may be provided in a variety of settings including the home, community, or nursing home and it may provide support and assist with activities of daily living.

American Health Care Association (AHCA)
<http://www.ahcancal.org>

National Association for the Support of Long Term Care (NASL) <http://www.nasl.org>

See also Aging; Chronic Diseases; Gerontology; Nursing Homes

127. Lung Diseases

Lung diseases are conditions that affect the lungs and may cause people to experience difficulty in breathing. Many factors that cause lung disease are behavioral, environmental, and biological in nature.

American Lung Association <http://www.lungusa.org>

National Heart, Lung, and Blood Institute (NHLBI)
<http://www.nhlbi.nih.gov>

See also Asthma; Cancer; Tobacco Use

128. Managed Care

Managed care is the term that is used to refer to the techniques that are designed to control healthcare costs and improve the quality of care through such mechanisms as cost-sharing and financial incentives. Managed care may operate in a variety of forms, including as health maintenance organizations or preferred provider organizations.

Academy of Managed Care Pharmacy (AMCP)
<http://www.amcp.org>

Academy of Managed Care Providers (AMCP)
<http://www.academymcp.org>

American Association of Managed Care Nurses (AAMCN)
<http://www.aamcn.org>

American Board of Managed Care Medicine (ABMCM)
<http://www.abmcm.org>

Integrated Healthcare Association (IHA) <http://www.ih.org>

See also Health Insurance; Healthcare Financial Management

129. Medicaid

Medicaid is a health program for individuals and families with low income and resources that is jointly funded by the federal government and states. The Medicaid program is means tested and primarily serves the elderly, disabled, and low-income families with children.

Centers for Medicare and Medicaid Services (CMS)
<http://www.cms.hhs.gov>

National Academy for State Health Policy (NASHP)
<http://www.nashp.org>

National Association of State Medicaid Directors (NASMD)
<http://www.nasmd.org>

See also Centers for Medicare and Medicaid Services CMS; Health Insurance; Medicaid, List of State Programs

130. Medicaid, List of State Programs

The list of state programs of Medicaid includes the programs that are run by each state. The specific benefits and eligibility requirements provided by the Medicaid program may vary according to state.

Alabama Medical Agency <http://www.medicaid.state.al.us>

Alaska Department of Health and Social Services
<http://www.hss.state.ak.us>

Arizona Health Care Cost Containment System (AHCCCS)
<http://www.ahcccs.state.az.us>

Arkansas Department of Human Services
http://www.arkansas.gov/dhs/serv_gr.html

California Department of Health Services
<http://www.medi-cal.ca.gov>

Colorado Department of Health Care Policy and Financing <http://www.chcpf.state.co.us>

Connecticut Department of Social Services, Medical Care Administration <http://www.ctmedicalprogram.com>

Delaware Department of Health and Social Services
<http://www.dhss.delaware.gov/dhss/dph/index.html>

Department of Health and Human Services, Office of Medicaid Business and Policy <http://www.dhhs.state.nh.us/DHHS>

Florida Agency for Health Care Administration
<http://www.fdhc.state.fl.us/Medicaid/index.shtml>

Georgia Department of Community Health, Medical Assistance Plans <http://www.dch.georgia.gov>

Hawaii Department of Human Services, Med-Quest Division
<http://www.state.hi.us/dhs>

Idaho Department of Health and Welfare, Division of Medicaid <http://www.healthandwelfare.idaho.gov>

Illinois Department of Healthcare and Family Services, Medicaid and SCHIP Programs <http://www.hfs.illinois.gov>

Indiana Family and Social Services Administration, Office of Medicaid Policy and Planning <http://www.in.gov/fssa>

Iowa Department of Human Services, Division of Medical Services <http://www.dhs.state.ia.us>

Kansas Medical Assistance Program
<https://www.kmap-state-ks.us>

Kentucky Cabinet for Health and Family Services
<http://www.chfs.ky.gov>

Louisiana Department of Health and Hospitals, Bureau of Health Services Financing <http://www.dhh.state.la.us>

Maine Department of Health and Human Services, Bureau of Medical Services <http://www.maine.gov/dhhs/bms>

Maryland Department of Health and Mental Hygiene
<http://www.dhmh.state.md.us/mma/mmahome.html>

Massachusetts Department of Health and Human Services, Office of Medicaid <http://www.mass.gov>

Michigan Department of Community Health
<http://www.michigan.gov/mdch>

Minnesota Department of Human Services
<http://www.dhs.state.mn.us>

Mississippi Division of Medicaid <http://www.medicaid.ms.gov/>

Missouri Department of Social Services, Division of Medical Services <http://www.dss.mo.gov/dms>

Montana Department of Public Health and Human Services
<http://www.dphhs.mt.gov/PHSD>

Nebraska Health and Human Services and Support
<http://www.hhs.state.ne.us/med/medindex.htm>

Nevada Division of Health Care Financing and Policy
<http://dhcfc.state.nv.us>

New Jersey Department of Human Services, Division of Medical Assistance and Health <http://www.state.nj.us/humanservices/dmahs/dhsmed.html>

New Mexico Department of Human Services, Medical Assistance Division <http://www.hsd.state.nm.us/mad>

New York Department of Health, Medicaid http://www.health.state.ny.us/health_care/medicaid/index.htm

North Carolina Department of Health and Human Services,
Division of Medical Assistance
<http://www.dhhs.state.nc.us/dma>

North Dakota Department of Human Services, Medical
Services <http://www.nd.gov/dhs/services/medicalserv>

Ohio Department of Job and Family Services, Ohio Health
Plans <http://www.jfs.ohio.gov>

Oklahoma Health Care Authority
<http://www.ohca.state.ok.us>

Oregon Department of Human Resources, Office of Medical
Assistance Programs <http://www.oregon.gov/DHS/healthplan/index.shtml>

Pennsylvania Department of Public Welfare, Medical Assistance
Programs <http://www.dpw.state.pa.us>

Rhode Island Department of Human Services, Medical
Assistance Program
<http://www.dhs.state.ri.us/dhs/adults/dmadult.htm>

South Carolina Department of Health and Human Services
<http://www.dhhs.state.sc.us/dhhsnew/index.asp>

South Dakota Department of Social Services, Medical
Services <http://www.dss.sd.gov>

Tennessee Bureau of TennCare
<http://www.state.tn.us/tenncare>

Texas Health and Human Services Commission
<http://www.hhsc.state.tx.us/medicaid>

Utah Department of Health <http://health.utah.gov/medicaid>

Vermont Department of Social Welfare, Office of Health Access
<http://ovha.vermont.gov>

Virginia Department of Medical Assistance Services
<http://www.dmas.virginia.gov>

Washington, D.C. Department of Health, Medical Assistance
Administration
http://app.doh.dc.gov/about/index_maa.shtm

Washington Department of Social and Health Services, Medical
Assistance Administration
<http://fortress.wa.gov/dshs/maa/index.html>

West Virginia Department of Health and Human Resources,
Bureau for Medical Services <http://www.wvdhhr.org/bms>

Wisconsin Department of Health and Family Services, Division
of Health Care Financing
<http://www.dhfs.state.wi.us/medicaid>

Wyoming Department of Health, Office of Health Care
Financing
<http://wdh.state.wy.us/healthcarefin/equalitycare/index.html>

See also Centers for Medicare and Medicaid Services (CMS);
Health Insurance; Medicaid

131. Medical Assistants

Medical assistants are healthcare professionals who provide administrative and clinical support. Medical assistants may be employed in both inpatient and outpatient healthcare settings.

American Association of Medical Assistants (AAMA)
<http://www.aama-ntl.org>

See also Allied Health; Clinical Laboratories

132. Medical Billing

Medical billing is the process of submitting claims to payers for healthcare services rendered.

American Academy of Professional Coders (AAPC)
<http://www.aapc.com>

Healthcare Billing and Management Association (HBMA)
<http://www.hbma.com>

Medical Association of Billers (MAB)
<http://www.e-medbill.com>

See also Disease and Procedure Classifications; Fraud and Abuse; Health Insurance; Healthcare Financial Management; Medical Records

133. Medical Colleges, Associations of

Associations of medical colleges represent a group of medical schools that work to improve the healthcare system.

American Association of Colleges of Osteopathic Medicine
(AACOM) <http://www.aacom.org>

Association of American Medical Colleges (AAMC)
<http://www.aamc.org>

Association of Faculties of Medicine of Canada (AFMC)
<http://www.afmc.ca>

See also Medical Colleges, List of; Physicians

134. Medical Colleges, List of

The list of medical colleges includes all medical colleges, universities, and programs that train professionals to enter the field of medicine.

Alabama

University of Alabama School of Medicine,
Birmingham, AL
<http://main.uab.edu/uasom/show.asp?durki=2023>

University of South Alabama College of Medicine, Mobile,
AL <http://www.southalabama.edu/com>

Arizona

University of Arizona College of Medicine, Tucson, AZ
<http://www.medicine.arizona.edu>

Arkansas

University of Arkansas for Medical Sciences, College of
Medicine, Little Rock, AR
<http://www.uams.edu/com/default.asp>

California

Keck School of Medicine of the University of Southern
California, Los Angeles, CA
<http://www.usc.edu/schools/medicine/ksom.html>

Loma Linda University School of Medicine, Loma Linda,
CA <http://www.llu.edu/llu/medicine>

Stanford University School of Medicine, Stanford, CA
<http://med.stanford.edu>

University of California, Davis, School of Medicine, Davis,
CA <http://www.ucdmc.ucdavis.edu/medschool>

University of California, Irvine, College of Medicine, Irvine,
CA <http://www.ucihs.uci.edu>

University of California, Los Angeles, David Geffen School of
Medicine, Los Angeles, CA
<http://dgsom.healthsciences.ucla.edu>

University of California, San Diego, School of Medicine, La
Jolla, CA <http://som.ucsd.edu>

University of California, San Francisco, School of Medicine,
San Francisco, CA <http://medschool.ucsf.edu>

Colorado

University of Colorado School of Medicine, Denver,
CO <http://www.uchsc.edu/sm/sm/offdean.htm>

Connecticut

University of Connecticut School of Medicine, Farmington,
CT <http://www.uchc.edu>

Yale University School of Medicine, New Haven, CT
<http://info.med.yale.edu/ysm>

District of Columbia

Georgetown University School of Medicine, Washington,
DC <http://som.georgetown.edu/index.html>

George Washington University School of Medicine and Health
Sciences, Washington, DC <http://www.gwumc.edu>

Howard University College of Medicine, Washington,
DC <http://www.med.howard.edu>

Florida

Florida State University College of Medicine, Tallahassee,
FL <http://med.fsu.edu>

University of Florida College of Medicine, Gainesville,
FL <http://www.med.ufl.edu>

University of Miami Leonard M. Miller School of Medicine,
Miami, FL <http://www.med.miami.edu>

University of South Florida College of Medicine,
Tampa, FL <http://health.usf.edu/medicine/home.html>

Georgia

Emory University School of Medicine, Atlanta, GA
<http://www.med.emory.edu/index.cfm>

Medical College of Georgia School of Medicine, Augusta,
GA <http://www.mcg.edu>

Mercer University School of Medicine, Macon, GA
<http://medicine.mercer.edu>

Morehouse School of Medicine, Atlanta, GA
<http://www.msm.edu>

Hawaii

University of Hawaii, John A. Burns School of Medicine,
Honolulu, HI <http://jabsom.hawaii.edu/jabsom>

Illinois

Chicago Medical School at Rosalind Franklin University of
Medicine and Science, North Chicago, IL
<http://www.rosalindfranklin.edu>

Loyola University Chicago Stritch School of Medicine,
Maywood, IL <http://www.meddean.lumc.edu>

Northwestern University, Feinberg School of Medicine,
Chicago, IL <http://www.medschool.northwestern.edu>

Rush Medical College of Rush University Medical
Center <http://www.rushu.rush.edu/medcol>

Southern Illinois University School of Medicine, Springfield,
IL <http://www.siumed.edu>

University of Chicago, Division of the Biological Sciences,
Pritzker School of Medicine, Chicago, IL
<http://pritzker.bsd.uchicago.edu>

University of Illinois College of Medicine, Chicago, IL
<http://www.uic.edu/depts/mcam>

Indiana

Indiana University School of Medicine, Indianapolis, IN
<http://www.medicine.iu.edu>

Iowa

University of Iowa, Roy J. and Lucille A. Carver College of
Medicine, Iowa City, IA <http://www.medicine.uiowa.edu>

Kansas

University of Kansas School of Medicine, Kansas City,
KS <http://www.kumc.edu/som/index.html>

Kentucky

University of Kentucky College of Medicine, Lexington,
KY <http://www.mc.uky.edu/medicine>

University of Louisville School of Medicine, Louisville,
KY <http://www.louisville.edu/medschool>

Louisiana

Louisiana State University School of Medicine in New Orleans,
New Orleans, LA <http://www.medschool.lsuhs.edu>

Louisiana State University School of Medicine in Shreveport,
LA <http://www.sh.lsuhs.edu/index.html>

Tulane University School of Medicine, New Orleans,
LA <http://www.som.tulane.edu>

Maryland

Johns Hopkins University School of Medicine, Baltimore,
MD <http://www.hopkinsmedicine.org>

Uniformed Services University of the Health Sciences, F. Edward
Herbert School of Medicine, Bethesda, MD
<http://www.usuhs.mil>

University of Maryland School of Medicine, Baltimore,
MD <http://medschool.umaryland.edu>

Massachusetts

Boston University School of Medicine, Boston, MA
<http://www.bumc.bu.edu>

Harvard Medical School, Boston, MA
<http://hms.harvard.edu/hms/home.asp>

Tufts University School of Medicine, Boston, MA
<http://www.tufts.edu/med>

University of Massachusetts Medical School, Worcester,
MA <http://www.umassmed.edu/index.aspx>

Michigan

Michigan State University College of Human Medicine, East
Lansing, MI <http://humanmedicine.msu.edu>

University of Michigan Medical School, Ann Arbor, MI
<http://www.med.umich.edu/medschool>

Wayne State University School of Medicine, Detroit, MI
<http://www.med.wayne.edu>

Minnesota

Mayo Medical School, Rochester, MN
<http://www.mayo.edu/mms>

University of Minnesota Medical School, Minneapolis, MN
<http://www.med.umn.edu>

Mississippi

University of Mississippi School of Medicine, Jackson, MS
<http://som.umc.edu>

Missouri

Saint Louis University School of Medicine, St. Louis, MO
<http://medschool.slu.edu/index.phtml>

University of Missouri, Columbia, School of Medicine,
Columbia, MO <http://www.muhealth.org~medicine>

University of Missouri, Kansas City, School of Medicine,
St. Louis, MO <http://research.med.umkc.edu>

Washington University in St. Louis School of Medicine,
St. Louis, MO <http://medinfo.wustl.edu>

Nebraska

Creighton University School of Medicine, Omaha, NE
<http://www2.creighton.edu/medschool>

University of Nebraska College of Medicine, Omaha, NE
<http://www.unmc.edu/dept/com/index.cfm>

Nevada

University of Nevada School of Medicine, Reno, NV
<http://www.unr.edu/med>

New Hampshire

Dartmouth Medical School, Hanover, NH
<http://dms.dartmouth.edu>

New Jersey

University of Medicine and Dentistry of New Jersey, New Jersey Medical School, Newark, NJ <http://njms.umdnj.edu>

University of Medicine and Dentistry of New Jersey, Robert Wood Johnson Medical School, Piscataway, NJ
<http://rwjms.umdnj.edu>

New Mexico

University of New Mexico School of Medicine, Albuquerque, NM <http://hsc.unm.edu/som>

New York

Albany Medical College, Albany, NY <http://www.amc.edu>

Albert Einstein College of Medicine of Yeshiva University, Bronx, NY <http://www.aecom.yu.edu/home>

Columbia University College of Physicians and Surgeons, New York, NY <http://cpmcnet.columbia.edu/dept/ps>

Joan and Sanford I. Weill Medical College of Cornell University, New York, NY <http://www.med.cornell.edu>

Mount Sinai School of Medicine of New York University, New York, NY <http://www.mssm.edu>

New York Medical College, Valhalla, NY
<http://www.nymc.edu>

New York University School of Medicine, New York, NY
<http://www.med.nyu.edu/education>

State University of New York Downstate Medical Center College of Medicine, Brooklyn, NY
http://downstate.edu/college_of_medicine/default.html

State University of New York Upstate Medical University, Syracuse, NY <http://www.upstate.edu>

Stony Brook University Health Sciences Center School of Medicine, Stony Brook, NY
<http://www.stonybrookmedicalcenter.org/hsc/index.cfm>

University at Buffalo, State University of New York School of Medicine and Biomedical Sciences, Buffalo, NY
<http://wings.buffalo.edu/smb>

University of Rochester School of Medicine and Dentistry, Rochester, NY <http://www.urmc.rochester.edu/SMD>

North Carolina

Brody School of Medicine at East Carolina University, Greenville, NC <http://www.ecu.edu/med>

Duke University School of Medicine, Durham, NC
<http://medschool.duke.edu>

University of North Carolina at Chapel Hill School of Medicine, Chapel Hill, NC <http://www.med.unc.edu>

Wake Forest University School of Medicine, Winston-Salem, NC <http://www1.wfubmc.edu>

North Dakota

University of North Dakota School of Medicine and Health Sciences, Grand Forks, ND
<http://www.med.und.nodak.edu>

Ohio

Case Western Reserve University School of Medicine, Cleveland, OH <http://mediswww.meds.cwru.edu>

Northeastern Ohio Universities College of Medicine, Rootstown, OH <http://www.neoucom.edu>

Ohio State University College of Medicine, Columbus, OH <http://medicine.osu.edu>

University of Cincinnati College of Medicine, Cincinnati, OH <http://www.med.uc.edu>

University of Toledo College of Medicine, Toledo, OH
<http://hsc.utoledo.edu/med>

Wright State University Boonshoft School of Medicine, Dayton, OH <http://www.med.wright.edu>

Oklahoma

University of Oklahoma College of Medicine, Oklahoma City, OK <http://www.medicine.ouhsc.edu>

Oregon

Oregon Health and Science University School of Medicine, Portland, OR <http://www.ohsu.edu>

Pennsylvania

Drexel University College of Medicine, Philadelphia, PA <http://www.drexelmed.edu>

Jefferson Medical College of Thomas Jefferson University, Philadelphia, PA <http://www.jefferson.edu/jmc>

Pennsylvania State University College of Medicine, Hershey, PA <http://www.hmc.psu.edu/college>

Temple University School of Medicine, Philadelphia,
PA <http://www.temple.edu/medicine>

University of Pennsylvania School of Medicine, Philadelphia,
PA <http://www.med.upenn.edu>

University of Pittsburgh School of Medicine,
Pittsburgh, PA <http://www.medschool.pitt.edu>

Rhode Island

Brown Medical School, Providence, RI <http://bms.brown.edu>

South Carolina

Medical University of South Carolina College of Medicine,
Charleston, SC <http://www.musc.edu/com1>

University of South Carolina School of Medicine, Columbia,
SC <http://www.med.sc.edu>

South Dakota

Sanford School of Medicine of the University of South Dakota,
Sioux Falls, SD <http://www.usd.edu/med>

Tennessee

East Tennessee State University James H. Quillen College of
Medicine, Johnson City, TN <http://com.etsu.edu>

Meharry Medical College, Nashville, TN <http://www.mmc.edu>

University of Tennessee Health Science Center College of
Medicine, Memphis, TN <http://www.utmem.edu>

Vanderbilt University School of Medicine, Nashville,
TN <http://www.mc.vanderbilt.edu/medschool>

Texas

Baylor College of Medicine, Houston, TX
<http://www.bcm.edu>

Texas A&M University System Health Science Center School of
Medicine, College Station, TX
<http://medicine.tamhsc.edu>

Texas Tech University Health Sciences Center School of
Medicine, Lubbock, TX <http://www.ttuhs.edu/som>

University of Texas Medical Branch at Galveston, Galveston,
TX <http://www.utmb.edu>

University of Texas Medical School at Houston, Houston,
TX <http://med.uth.tmc.edu>

University of Texas Medical School at San Antonio,
San Antonio, TX <http://som.uthscsa.edu>

University of Texas Southwestern Medical Center at Dallas,
Dallas, TX <http://www8.utsouthwestern.edu/home/education/medicalschooll/index.html>

Utah

University of Utah School of Medicine, Salt Lake City,
UT <http://uuhsc.utah.edu>

Vermont

University of Vermont College of Medicine, Burlington,
VT <http://www.med.uvm.edu>

Virginia

Eastern Virginia Medical School, Norfolk, VA
<http://www.evms.edu>

University of Virginia School of Medicine, Charlottesville,
VA <http://www.healthsystem.virginia.edu/internet/som/home.cfm>

Virginia Commonwealth University School of Medicine,
Richmond, VA <http://www.medschool.vcu.edu>

Washington

University of Washington School of Medicine, Seattle,
WA <http://www.uwmedicine.org>

West Virginia

Joan C. Edwards School of Medicine at Marshall University,
Huntington, WV <http://musom.marshall.edu/index2.asp>

West Virginia University School of Medicine, Morgantown,
WV <http://www.hsc.wvu.edu/som>

Wisconsin

Medical College of Wisconsin, Milwaukee, WI
<http://www.mcw.edu>

University of Wisconsin School of Medicine and Public Health,
Madison, WI <http://www.med.wisc.edu>

See also Academic Medical Centers; Medical Colleges,
Association of; Physicians

135. Medical Decision Making

Medical decision making involves the systematic approach of making appropriate choices to improve health, healthcare, and policy decisions.

Foundation for Informed Medical Decision Making
<http://www.fimdm.org>

Society for Medical Decision Making (SMDM)
<http://www.smdm.org>

See also Clinical Practice Guidelines; Evidence-Based Medicine
 EBM; Informatics; Randomized Controlled Trials (RCT)

136. Medical Errors

Medical errors involve the diagnosis or treatment by a provider that results in injury or harm to a patient. Medical errors can range from minor to severe and impose significant costs to the healthcare system.

Med-E.R.R.S. <http://www.med-errs.com>

Medication Compliance Institution (MCI)
<http://medicationcomplianceinstitute.org>

National Council on Patient Information and Education
 (NCPPIE) <http://www.talkaboutrx.org>

National Coordinating Council for Medication Error Reporting
 and Prevention (NCCMERP) <http://www.nccmerp.org>

See also Health Outcomes; Medical Malpractice; Patient Safety;
 Quality of Healthcare

137. Medical Group Practice

Medical group practice is a group of physicians who share the same office and/or other healthcare resources. About half of all physician practices are group practices.

Medical Group Management Association (MGMA)
<http://www.mgma.com>

See also Physicians

138. Medical Malpractice

Medical malpractice is an act of omission or commission by a healthcare provider that does not conform with the standard of care and results in harm or injury to a patient.

American Association for Justice, formerly the American Trial
 Lawyers of America
<http://www.justice.org>

American Tort Reform Association (ATRA)
<http://www.atra.org>

Health Law Section, American Bar Association (ABA)
<http://www.abanet.org/health>

See also Clinical Practice Guidelines; Health Law; Medical
 Errors; Patient Safety

139. Medical Practice Variations

Medical practice variations are differences in health-care utilization and spending across geographic areas.

Dartmouth Atlas of Healthcare <http://www.dartmouthatlas.org>

See also Clinical Practice Guidelines; Geographic Information
 Systems (GIS); Quality of Healthcare

140. Medical Records

Medical records include the official documentation of a patient's medical history and care and they are traditionally maintained by the healthcare provider.

American Academy of Professional Coders (AAPC)
<http://www.aapc.com>

American Health Information Management Association
 (AHIMA) <http://www.ahima.org>

Medical Records Institute (MRI) <http://www.medrecinst.com>

See also Disease and Procedure Classifications; Health Insurance
 Portability and Accountability Act of 1996 (HIPAA);
 Informatics; Medical Billing

141. Medical Residents and Interns

Medical residents and interns include physicians who have completed medical school but are undergoing further training under the supervision of a fully licensed physician. Residencies allow physicians to gain a more in-depth experience within a particular specialty of medicine.

American Medical Student Association (AMSA)
<http://www.amsa.org>

National Association of Residents and Interns (NARI)
<http://www.nari-assn.com>

National Resident Matching Program (NRMP)
<http://www.nrmp.org>

Resident Web <http://www.residentweb.com>

See also Hospitals; Physicians

142. Medical Sociology

Medical sociology is the study of individuals and groups within the social context of health, illness, and

healthcare. Medical sociology draws upon a number of different perspectives to understand health and healthcare within the context of sociology.

American Sociological Association (ASA)
<http://www.asanet.org>

British Sociological Association
<http://www.britisoc.co.uk/medsoc>

Medical Sociology Section of the American Sociological Association (ASA)
<http://dept.kent.edu/sociology/asamedsoc>

SocioSite: Sociology of Health <http://www.sociosite.net>

See also Disease and Procedure Classifications; Health

143. Medical Technologists

Medical technologists are healthcare professionals who perform clinical tests on bodily fluids and other specimens for diagnostic purposes. Medical technologists work in a variety of settings, including hospitals, physician's offices, and laboratories.

American Medical Technologists (AMT)
<http://www.amt1.com>

American Registry of Radiologic Technologists (ARRT)
<http://www.arrrt.org>

American Society of Radiologic Technologists (ASRT)
<http://www.asrt.org>

Association of Surgical Technologists (AST)
<http://www.ast.org>

See also Allied Health; Clinical Laboratories; Medical Tests and Diagnostics

144. Medical Tests and Diagnostics

Medical tests and diagnostics are clinical tests that are performed to aid in the diagnosis of a health condition.

Lab Tests Online <http://www.labtestsonline.org>

Tests and Procedures, MedlinePlus
<http://www.nlm.nih.gov/medlineplus/tutorial.html>

See also Allied Health; Clinical Laboratories; Medical Technologists

145. Medicare

Medicare is a federal health insurance program for those 65 years of age or older and other defined benefits groups. The Centers for Medicare and Medicaid Services (CMS) administer the Medicare program.

Centers for Medicare and Medicaid Services (CMS)
<http://www.cms.hhs.gov>

Medicare Rights Center <http://www.medicarerights.org>

See also Centers for Medicare and Medicaid Services (CMS); Health Insurance; Hospitals

146. Medicare Prescription Drug Coverage (Medicare Part D)

The Medicare prescription drug coverage program is a program that allows Medicare beneficiaries to receive coverage for their prescription drugs regardless of income, health status, or type of prescription drugs used. This program covers both brand name and generic drugs.

Centers for Medicare and Medicaid Services (CMS)
<http://www.cms.hhs.gov/PrescriptionDrugCovGenIn>

MedicareAide.Com <http://www.medicareaide.com/index.html>

Medicare.gov
<http://www.medicare.gov/medicarereform/drugbenefit.asp>

My Medicare Matters, The National Council on the Aging <http://www.mymedicarematters.org>

Policy and Advocacy, American Academy of Family Physicians (AAFP) <http://www.aafp.org/online/en/home/policy/medicare.html>

Resources on the Medicare Prescription Drug Benefit, Kaiser Family Foundation (KFF)
<http://www.kff.org/medicare/rxdrugbenefit.cfm>

See also Drugs; Drugs, Prices of; Medicare; Pharmacoeconomics

147. Mental Health

Mental health may be referred to as the level of an individual's cognitive and emotion well-being and the absence of any mental condition. Mental health is needed to ensure proper functioning and quality of life.

American Psychiatric Association <http://www.psych.org>

American Psychological Association (APA)
<http://www.apa.org>

Depression and Bipolar Support Alliance (DBSA)
<http://www.dbsalliance.org>

National Alliance for Research on Schizophrenia and
 Depression (NARSAD) <http://www.narsad.org>

National Alliance for the Mentally Ill <http://www.nami.org>

National Association of State Mental Health Program Directors
 (NASMHPD) <http://www.nasmhpd.org>

National Institute of Mental Health (NIMH)
<http://www.nimh.nih.gov>

National Mental Health Association (NMHA)
<http://www.nmha.org>

SAMHSA's National Mental Health Information Center
<http://www.mentalhealth.samhsa.gov>

World Federation for Mental Health (WFMH)
<http://www.wfmh.org>

See also Disability; Psychiatric Care

148. Mentally Disabled

Mentally disabled refers to the chronic disability that is caused by a mental disorder(s) and it may also involve physical impairment. Mental disability also affects an individual's ability in daily functioning.

American Association on Mental Retardation (AAMR)
<http://www.aamr.org>

Association for the Help of Retarded Children (AHRC)
<http://www.ahrc.org>

See also Disability; Mental Health; Psychiatric Care

149. Migrant Health

Migrant health is concerned with promoting the health of the Mexican border communities and farmworkers.

Migrant Clinicians Network <http://www.migrantclinician.org>

Office of Rural Health Policy, Health Resources and Services
 Administration (HRSA) <http://ruralhealth.hrsa.gov>

Washington Association of Community and Migrant Health
 Centers <http://www.wacmhc.org>

See also Hispanic; Public Health; Rural Health

150. Military Health Systems

Military health systems refers to the healthcare systems that serve the members and retirees of the military and

their families. The military health system also responds to natural disasters, humanitarian crises, and military operations.

Office of the Assistant Secretary of Defense (Health Affairs)
<http://www.health.mil>

TRICARE, Military Health System <http://www.tricare.mil>

See also Federal Government; Veterans Health

151. Minority Health

Minority health is concerned with the health issues of racial and ethnic minority groups and the elimination of health disparities.

Alliance of Minority Medical Associations
<http://www.allamericanhealth.org>

American Public Health Association (APHA)
<http://www.apha.org>

Asian and Pacific Islander American Health Forum
<http://www.apiahf.org>

Association of American Indian Physicians
<http://www.aaip.org>

Association of Asian Pacific Community Health
 Organizations <http://www.aapcho.org>

Health Professionals for Diversity, Association of American
 Medical Colleges <http://www.aamc.org/diversity>

National Alliance for Hispanic Health
<http://www.hispanichealth.org>

National Asian Women's Health Organizations
<http://www.nawho.org>

National Center on Minority Health and Health Disparities
 (NCMHD) <http://www.ncmhd.nih.gov>

National Hispanic Medical Association
<http://www.nhmamd.org>

National Indian Health Board <http://www.nihb.org>

National Medical Association <http://www.nmanet.org>

National Minority AIDS Council <http://www.nmac.org>

National Minority Quality Forum
<http://www.nmqf.org>

Transcultural Nursing Society <http://www.tcns.org>

See also African American Health; Hispanic; Native American Health; Nursing, Minority Associations

152. National Health Insurance

National health insurance is a universal, single-payer health program. A national health insurance program aims to provide healthcare coverage for everyone.

Physicians for a National Health Program (PNHP)
<http://www.pnhp.org>

See also Health Insurance; Health Policy Organizations;
 Uninsured Individuals

153. National Institutes of Health (NIH)

The National Institutes of Health (NIH) is the premier federal agency that conducts cutting-edge biomedical and health-related research in the United States. Through its institutes and centers, the NIH works to prevent, protect, diagnose, and treat diseases.

General

National Institutes of Health (NIH) <http://www.nih.gov>

Director

Office of the Director (OD) <http://www.nih.gov/icd/od>

Institutes

National Cancer Institute (NCI) <http://www.cancer.gov>

National Eye Institute (NEI) <http://www.nei.nih.gov>

National Heart, Lung, and Blood Institute (NHLBI)
<http://www.nhlbi.nih.gov>

National Human Genome Research Institute (NHGRI)
<http://www.genome.gov>

National Institute of Allergy and Infectious Diseases
 (NIAID) <http://www3.niaid.nih.gov>

National Institute of Arthritis and Musculoskeletal and Skin
 Diseases (NIAMS) <http://www.niams.nih.gov>

National Institute of Biomedical Imaging and Bioengineering
 (NIBIB) <http://www.nibib.nih.gov>

National Institute of Child Health and Human Development
 (NICHD) <http://www.nichd.nih.gov>

National Institute of Dental and Craniofacial Research
 (NIDCR) <http://www.nidcr.nih.gov>

National Institute of Diabetes and Digestive and Kidney
 Diseases (NIDDK) <http://www2.niddk.nih.gov>

National Institute of Environmental Health Sciences (NIEHS)
<http://www.niehs.nih.gov>

National Institute of General Medical Sciences (NIGMS)
<http://www.nigms.nih.gov>

National Institute of Mental Health (NIMH)
<http://www.nimh.nih.gov>

National Institute of Neurological Disorders and Stroke
 (NINDS) <http://www.ninds.nih.gov>

National Institute of Nursing Research (NINR)
<http://www.ninr.nih.gov>

National Institute on Aging (NIA) <http://www.nia.nih.gov>

National Institute on Alcohol Abuse and Alcoholism
 (NIAAA) <http://www.niaaa.nih.gov>

National Institute on Deafness and Other Communication
 Disorders (NIDCD) <http://www.nidcd.nih.gov>

National Institute on Drug Abuse (NIDA)
<http://www.nida.nih.gov>

National Library of Medicine (NLM) <http://www.nlm.nih.gov>

Centers

Center for Information Technology (CIT)
<http://www.cit.nih.gov>

Center for Scientific Review (CSR) <http://cms.csr.nih.gov>

John E. Fogarty International Center (FIC)
<http://www.fic.nih.gov>

National Center for Complementary and Alternative Medicine
 (NCCAM) <http://www.nccam.nih.gov>

National Center for Research Resources (NCRR)
<http://www.ncrr.nih.gov>

National Center on Minority Health and Health Disparities
 (NCMHD) <http://www.ncmhd.nih.gov>

NIH Clinical Center (CC) <http://clinicalcenter.nih.gov>

See also Centers for Disease Control and Prevention (CDC);
 Federal Government; Public Health

154. Native American Health

Native American health refers to the unique health needs of this group.

American Indian Health, National Library of Medicine
 (NLM) <http://americanindianhealth.nlm.nih.gov>

Indian Health Service (IHS), U.S. Department of Health and
 Human Services (HHS) <http://www.ihs.gov>

Medicare and Medicaid Services for American Indian and Alaska Native, Centers for Medicare and Medicaid Services (CMS) <http://www.cms.hhs.gov/aian>

National Council of Urban Indian Health (NCUIH) <http://www.ncuih.org>

See also Health Disparities; Minority Health; Public Health

155. Nephrology

Nephrology is the medical specialty that focuses on diseases and conditions of the kidney.

American Society of Nephrology (ASN) <http://www.asn-online.org>

Kidney Transplant/Dialysis Association (KT/DA) <http://www.ktda.org>

National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) <http://www2.niddk.nih.gov>

Renal Physicians Association <http://www.renalmd.org>

See also Chronic Diseases; Kidney Diseases

156. Neurological Disorders

Neurological disorders are disorders of the brain and nervous system. Many organizations are dedicated to researching, advocating, and developing policies related to neurological disorders.

American Association of Neuromuscular and Electrodiagnostic Medicine (AANEM) <http://www.aanem.net>

American Parkinson Disease Association (APDA) <http://www.apdaparkinson.org>

Amyotrophic Lateral Sclerosis Association (ALSA) <http://www.alsa.org>

Children and Adults with Attention Deficit/Hyperactivity Disorders (CHADD) <http://www.chadd.org>

Huntington's Disease Society of America (NDSA) <http://www.hdsa.org>

Multiple Sclerosis Foundation (MSF) <http://www.msfocus.org>

Muscular Dystrophy Association (MDA) <http://www.mdausa.org>

National Institute of Neurological Disorders and Stroke (NINDS) <http://www.ninds.nih.gov>

National Multiple Sclerosis Society (NMSS) <http://www.nmss.org>

National Parkinson Foundation (NPF) <http://www.parkinson.org>

Parkinson's Disease Foundation (PDF) <http://www.pdf.org>

Tourette Syndrome Association (TSA) <http://www.tsa-usa.org>

See also Disability; National Institutes of Health (NIH); Neurology; Stroke

157. Neurology

Neurology is the specialty of medicine that deals with the study of the brain and nervous system.

American Academy of Neurology (AAN) <http://www.aan.com>

See also Physicians; Neurological Disorders; Neurosurgery; Spinal Disorders and Injuries

158. Neurosurgery

Neurosurgery is the discipline of surgery that focuses on treating disorders of the central and peripheral nervous system and spinal cord. The field of neurosurgery has undergone many advancements with the development of new medical technologies.

American Association of Neurological Surgeons (AANS) <http://www.aans.org>

See also Neurological Disorders; Neurology; Surgery and Surgeons

159. News Services

News services provide information to the public on recent medical breakthroughs, discoveries, and research findings. News services play an important part in disseminating the latest knowledge.

American Medical News (AMA) <http://www.ama-assn.org/amednews>

CNN Health <http://www.cnn.com/health/library>

MedlinePlus: Health News <http://www.nlm.nih.gov/medlineplus/newsbydate.html>

Reuters Health Information Services <http://www.reutershealth.com>

See also Health Services Research Journals; Journals, Medical

160. Nuclear Medicine

Nuclear medicine is the field of medicine and medical imaging that uses nuclear compounds to aide in diagnosis and treatment.

Society of Nuclear Medicine (SNM) <http://www.snm.org>

See also Cancer; Medical Tests and Diagnostics; Oncology

161. Nurse Practitioners

Nurse practitioners are registered nurses with advanced training who provide a range of healthcare services. Nurse practitioners are able to diagnose and treat common and some complicated conditions.

American Academy of Nurse Practitioners (AANP)
<http://www.aanp.org>

See also Nursing; Rural Health

162. Nursing

Nursing is a healthcare profession that advocates and provides care to individuals, families, and communities. Nursing has been described as an art and science that promotes the quality of life of individuals from birth until death.

American Nurses Association (ANA)
<http://www.nursingworld.org>

National League for Nursing (NLN) <http://www.nln.org>

See also Nurse Practitioners; Nursing, Collegiate Organizations; Nursing Specialities

163. Nursing, Collegiate Organizations

Collegiate organizations of nursing are organizations that represent the concerns of nursing professionals.

American Association of Colleges of Nursing
<http://www.aacn.nche.edu>

American College of Nurse Practitioners
<http://www.acnpweb.org>

Canadian Nurses Association (CNA) <http://www.cna-nurses.ca>

Commission on Graduates of Foreign Nursing Schools
(CGFNS International) <http://www.cgfns.org>

National Student Nurses' Association, Inc. <http://www.nsna.org>

See also Nursing; Nursing, Minority Associations of; Nursing Specialities

164. Nursing, Minority Associations of

Minority associations of nursing are organizations of racial and ethnic nursing professionals.

Aboriginal Nurses Association of Canada <http://www.anac.on.ca>

American Assembly for Men in Nursing <http://www.aamn.org>

Asian and Pacific Islander Nurses Association
<http://www.aapina.org>

Filipino Nurses Online <http://www.filipinonurses.net>

National Alaska Native/American Indian Nurses Association
<http://www.nanainurses.org/>

National Association of Hispanic Nurses
<http://www.thehispanicnurses.org>

National Black Nurses Association, Inc. <http://www.nbna.org>

National Coalition of Ethnic Minority Nurse Association
<http://www.ncemna.org>

Philippine Nurses Association of America
<http://www.philippinenursesaa.org>

See also Minority Health; Nursing; Nursing, Collegiate Organizations

165. Nursing Homes

Nursing homes are facilities that provide constant nursing care to individuals who have deficits with activities of daily living. Residents of nursing homes typically include the elderly and disabled.

American College of Health Care Administrators (ACHCA)
<http://www.achca.org>

American Association of Homes and Services for the Aging
(AAHSA) (it represents not-for-profit nursing homes)
<http://www.aahsa.org>

American Health Care Association (AHCA) (It represents both not-for-profit and for-profit nursing homes.)
<http://www.ahcancal.org>

American Medical Directors Association (AMDA)
<http://www.amda.com>

Catholic Health Association of the United States (CHA)
<http://www.chausa.org>

National Ministries (This organization was formerly the American Baptist Homes and Hospitals Association)
<http://www.nationalministries.org>

Nursing Home Compare, Centers for Medicare and Medicaid Services (CMS)
<http://www.medicare.gov/NHCompare/home.asp>

See also Aging; Alzheimer's Disease; Gerontology; Hospice and Palliative Care; Medicaid

166. Nursing Research

Nursing research is focused on research that aims to promote and improve the health of individuals, families, and communities.

National Institute of Nursing Research (NINR)
<http://www.ninr.nih.gov>

See also National Institutes of Health (NIH); Nursing; Nursing Specialties

167. Nursing Specialties

Nursing specialties include the many different focus areas within nursing that provide specialized care.

American Association of Critical Care Nurses (AACN)
<http://www.aacn.org>

American Association of Nurse Anesthetists (AANA)
<http://www.aana.org>

American Association of Occupational Health Nurses (AAOHN) <http://www.aaohn.org>

American College of Nurse Midwives (ACNM)
<http://www.midwife.org>

American Organization of Nurse Executives (AONE)
<http://www.aone.org>

Association of PeriOperative Registered Nurses (AORN)
<http://www.aorn.org>

Association of Rehabilitation Nurses (ARN)
<http://www.rehabnurse.org>

Association of Women's Health, Obstetrics and Neonatal Nurses (AWHONN) <http://www.awhonn.org>

Hospice and Palliative Nurses Association (HPNA)
<http://www.hpna.org>

National Association of Neonatal Nurses (NANN)
<http://www.nann.org>

National Association of Orthopaedic Nurses (NAON)
<http://www.orthonurse.org>

National Association of School Nurses (NASN)
<http://www.nasn.org>

Oncology Nursing Society (ONS) <http://www.ons.org>

Pediatric Nursing Certification Board
<http://www.pncb.org>

See also Nurse Practitioners; Nursing; Nursing Research

168. Obstetrics and Gynecology

Obstetrics and gynecology is the specialty of medicine that focuses on a women's reproductive organs. This specialty provides care to both pregnant and non-pregnant women.

American Board of Obstetrics and Gynecology (ABOG)
<http://www.abog.org>

American College of Obstetricians and Gynecologists (ACOG)
<http://www.acog.org>

American College of Osteopathic Obstetricians and Gynecologists (ACOOG) <http://www.acoog.org>

See also Childbirth; Child Development and Health; Physicians

169. Occupational Medicine

Occupational medicine is an interdisciplinary specialty of medicine that is concerned with the health, safety, and welfare of individuals at their work site or place of employment.

American College of Occupational and Environmental Medicine (ACOEM) <http://www.acoem.org>

American Industrial Hygiene Association (AIHA)
<http://www.aiha.org>

American Occupational Therapy Foundation (AOTF)
<http://www.aotf.org>

Canadian Centre for Occupational Health and Safety (CCOHS)
<http://www.ccohs.ca>

Institute for Work and Health (Canada)
<http://www.iwh.on.ca>

National Institute for Occupational Safety and Health (NIOSH) Information Inquiry Service
<http://www.cdc.gov/niosh/inquiry.html>

See also Injury; Physicians; Workers' Compensation

170. Oncology

Oncology is the specialty of medicine that focuses on cancers. The field of oncology deals with the screening, diagnosis, treatment, and follow-up of cancer patients as well as palliative care.

American Society of Clinical Oncology (ASCO)
<http://www.asco.org>

See also Cancer

171. Ophthalmology

Ophthalmology is the medical specialty that is concerned with conditions of the eye as well as surgical procedures dealing with the visual pathway that includes the eye, brain, and areas surrounding the eye.

American Academy of Ophthalmology (AAO)
<http://www.aao.org>

American Board of Ophthalmology (ABO)
<http://www.abop.org>

American Society of Cataract and Refractive Surgery (ASCRS) <http://www.ascrs.org>

Association for Research in Vision and Ophthalmology
<http://www.arvo.org>

Joint Commission on Allied Health Personnel in Ophthalmology (JCAHPO) <http://www.jcahpo.org>

See also Blind and Visually Impaired; Eye Diseases; Optometry; Physicians

172. Optometry

Optometry is a healthcare profession that focuses on the eye and surrounding structures, in addition to vision and visual processing.

American Academy of Optometry (AAO)
<http://www.aaopt.org>

American Optometric Association (AOA)
<http://www.aoanet.org>

National Board of Examiners in Optometry (NBEO)
<http://www.optometry.org>

National Optometric Association (NOA)
<http://www.natoptassoc.org/user/default.php>

See also Blind and Visually Impaired; Eye Diseases; Ophthalmology

173. Oral Health

Oral health is concerned with the health of the oral cavity including the teeth, gums, jawbone, and surrounding tissues. Oral health is necessary for overall good health.

National Institute of Dental and Craniofacial Research
<http://www.nidcr.nih.gov>

National Maternal and Child Oral Health Resource Center
<http://www.mchoralhealth.org>

See also Dentistry; Dentistry, Public Health; Public Health

174. Orthopedics

Orthopedics is the surgical specialty that focuses on conditions and injuries of the musculoskeletal system.

American Academy of Orthopaedic Surgeons (AAOS)
<http://www.aaos.org>

American Orthopaedic Association (AOA)
<http://www.aoasn.org>

American Orthopaedic Foot and Ankle Society (AOFAS)
<http://www.aofas.org>

Council on Chiropractic Orthopedics (CCO)
<http://www.ccodc.org>

Health Volunteers Overseas (OO) <http://www.hvousa.org>

See also Chiropractic Care; Injury; Physical Medicine and Rehabilitation

175. Osteopathic Medicine

Osteopathic medicine includes a branch of medicine that trains allopathic physicians. Osteopathic medicine focuses on osteopathic manipulative medicine and alternative medical therapies.

American Academy of Osteopathy (AAO)
<http://www.academyofosteopathy.org>

American Association of Colleges of Osteopathic Medicine (AACOM) <http://www.aacom.org>

American College of Osteopathic Family Physicians (ACOFP)
<http://www.acofp.org>

American Osteopathic Association (AOA)
<http://www.osteopathic.org>

See also Hospitals; Physicians

176. Osteoporosis

Osteoporosis is a disease of the bone where individuals have decreased bone mineral density that leads to a greater risk of fractures.

National Institutes of Health Osteoporosis and Related Bone Diseases National Resource Center
<http://www.osteoporosis.nih.gov>

National Osteoporosis Foundation (NOF) <http://www.nof.org>

See also Public Health; Women's Health Issues

177. Overweight and Obesity

Overweight and obesity is a condition when an individual gains excess body fat. This condition may cause an individual to have negative health consequences and be at greater risk for other health conditions.

American Society for Bariatric Surgery (ASBS)
<http://www.asbs.org>

Association for the Study of Obesity (ASO)
<http://www.aso.org.uk>

See also Diabetes; Diet and Nutrition; Eating Disorders; Fitness and Exercise

178. Pain

Pain management is the medical discipline that is concerned with relieving pain through a variety of techniques including pharmacologic, non-pharmacologic, and psychologic interventions.

American Academy of Pain Management
<http://www.aapainmanage.org>

American Pain Society (APS) <http://www.ampainsoc.org>

American Society of Regional Anesthesia and Pain Medicine (ASRA) <http://www.asra.com>

Canadian Pain Society (CPS)
<http://www.canadianpainsociety.ca>

Chronic Pain Association of Canada (CPAC)
<http://www.chronicpaincanada.com>

International Association for the Study of Pain (IASP)
<http://www.iasp-pain.org>

See also Health Outcomes; Hospice and Palliative Care; Quality of Healthcare

179. Patient Advocacy

Patient advocacy refers to acting on behalf of patients to protect their rights and assist in obtaining needed services and information. Patient advocacy generally involves liaising between the patient and healthcare provider.

Patient Care Partnership, American Hospital Association (AHA)
<http://www.aha.org/aha/issues/Communicating-With-Patients/index.html>

See also Health Law; Health Literacy; Medical Errors; Patient Safety

180. Patient Safety

Patient safety is the discipline that deals with reporting, analyzing, and preventing medical errors. Patient safety initiatives are increasing their recognition of the number of medical errors that occur each year.

Canadian Patient Safety Institute
<http://www.patientsafetyinstitute.ca>

Center for the Advancement of Patient Safety, U.S. Pharmacopeia <http://www.usp.org>

Communicating Health Care <http://www.geriamori.com>

Consumers Advancing Patient Safety
<http://www.patientsafety.org>

Doctors in Touch <http://www.doctorsintouch.com>

Emergency Medicine Patient Safety Foundation
<http://www.empsf.org>

FDA Patient Safety News <http://www.accessdata.fda.gov/scripts/cdrh/cfdocs/psn/index.cfm>

Institute for Healthcare Improvement <http://www.ihf.org>

Institute for Safe Medication Practices (ISMP)
<http://www.ismp.org>

Joint Commission International, Patient Safety
<http://www.jointcommission.org/PatientSafety>

National Patient Safety Foundation (NPSF) <http://www.npsf.org>

National Safety Council (NSC) <http://www.nsc.org>

Partnership for Patient Safety <http://www.p4ps.org>

Patient Safety and Quality Healthcare <http://www.psqh.com>

Patient Safety First, Association of periOperative Registered Nurses (AORN) <http://www.aorn.org/AboutAORN/WhoWeAre/PatientSafetyFirst>

Patient Safety Network, Agency for Healthcare Research and Quality (AHRQ) <http://psnet.ahrq.gov>

Premier Patient Safety Institute <http://www.premierinc.com>

VA National Center for Patient Safety
<http://www.patientsafety.gov>

Voice for Patients <http://www.voice4patients.com>

World Alliance for Patient Safety, World Health Organization (WHO) <http://www.who.int/patientsafety/en>

See also Health Literacy; Medical Errors; Medical Malpractice; Quality of Healthcare

181. Pathology

Pathology is the specialty of medicine that focuses on the diagnosis of disease by examining whole bodies, bodily fluids, organs, and tissues.

American Society for Clinical Pathology (ASCP)
<http://www.ascp.org>

College of American Pathologists (CAP) <http://www.cap.org>

International Academy of Pathology (IAP)
<http://iaphomepage.org>

See also Clinical Laboratories; Hospitals; Medical Tests and Diagnostics; Physicians

182. Pediatrics

Pediatrics is the medical specialty that provides medical care to infants, children, and adolescents.

American Academy of Pediatrics (AAP) <http://www.aap.org>

See also Child Development and Health; Immunization and Vaccination; Prevention and Health Promotion

183. Pharmaceutical Companies, Association of

The association of pharmaceutical companies includes a group that represents the interests of pharmaceutical manufacturers and biotechnology companies.

Pharmaceutical Research and Manufacturers of America (PHRMA) <http://www.phrma.org>

See also Drugs; Drugs, Prices of; Pharmaceutical Companies, List of

184. Pharmaceutical Companies, List of

The list of pharmaceutical companies includes a compilation of pharmaceutical manufacturers who produce medicines and therapies.

3M Pharmaceuticals <http://www.mmm.com>

Abbott <http://www.abbott.com>

Amgen, Inc. <http://www.amgen.com>

Amylin Pharmaceuticals, Inc. <http://www.amylin.com>

Astellas US LLC <http://www.astellas.com/en>

AstraZeneca LP <http://www.astrazeneca.com>

Baxter <http://www.baxter.com>

Bayer Healthcare Pharmaceuticals <http://www.pharma.bayer.com/scripts/pages/en/index.php>

Berlex Laboratories, Inc. <http://www.berlex.bayerhealthcare.com>

Boehringer Ingelheim Pharmaceuticals, Inc.
<http://www.boehringer-ingelheim.com>

Bristol-Myers Squibb Company
<http://www.bms.com>

Celgene Corporation <http://www.celgene.com>

Cephalon, Inc. <http://www.cephalon.com>

Daiichi Sankyo, Inc. <http://www.sankopharma.com>

Eli Lilly and Company <http://www.lilly.com>

Genzyme Corporation <http://www.genzyme.com>

GlaxoSmithKline <http://www.gsk.com>

Hoffman-La Roche, Inc. <http://www.rocheusa.com>

Johnson & Johnson <http://www.jnj.com>

Merck & Company, Inc. <http://www.merck.com>

Millennium Pharmaceuticals, Inc. <http://www.millennium.com>

Novartis Corporation <http://www.novartis.com>

Organon USA Inc. <http://www.schering-plough.com>

Otsuka America, Inc. <http://www.otsuka-us.com>

Pfizer, Inc. <http://www.pfizer.com/main>

Procter & Gamble Co. <http://www.pgpharma.com/index.shtml>

Purdue Pharma L.P. <http://www.purduepharma.com>

Sanofi-Aventis U.S.
<http://www.sanofi-aventis.us/live/us/en/index.jsp>

Schering-Plough Corporation
<http://www.schering-plough.com>

Schwarz Pharma, Inc. <http://www.schwarzpharma.com>

Sepracor, Inc. <http://www.sepracor.com>

Serono, Inc. <http://www.merckserono.net>

Solvay Pharmaceuticals, Inc.
<http://www.solvaypharmaceuticals-us.com>

Valeant Pharmaceuticals International
<http://www.valeant.com>

Wyeth <http://www.wyeth.com>

See also Drugs; Pharmacists and Pharmacy; Pharmacoeconomics

185. Pharmaceuticals

See Drugs

186. Pharmacists and Pharmacy

Pharmacists are healthcare professionals who dispense medication ordered by a healthcare provider and also counsel patients on the proper use and adverse effects. Pharmacy is the healthcare profession of pharmacists that is concerned with the safe and effective use of medications.

Academy of Managed Care Pharmacy (AMCP)
<http://www.amcp.org>

American Association of Colleges of Pharmacy (AACCP)
<http://www.aacp.org>

American College of Clinical Pharmacy (ACCP)
<http://www.accp.com>

American Pharmacists Association (APA)
<http://www.pharmacist.com>

American Society of Consultant Pharmacists (ASCP)
<http://www.ascp.com>

American Society of Health-System Pharmacists (ASHP)
<http://www.ashp.org>

National Association of Boards of Pharmacy (NABP)
<http://www.nabp.net>

National Pharmaceutical Association (NPhA)
<http://www.npha.net>

Society of Infectious Diseases Pharmacists (SIDP)
<http://www.sidp.org>

See also Drugs; Drugs, Generic; Pharmacoeconomics

187. Pharmacoeconomics

Pharmacoeconomics is a discipline that compares the relative value of one pharmaceutical agent to another by examining the costs and effects.

International Society for Pharmacoeconomics and Outcomes Research (ISPOR) <http://www.ispor.org>

Society for Medical Decision Making (SMDM)
<http://www.smdm.org>

See also Drugs; Drugs, Generic; Drugs, Prices of; Pharmacists and Pharmacy

188. Physical Medicine and Rehabilitation

Physical medicine and rehabilitation is the field of medicine that is focused on restoring the physical functioning of individuals who have a disability through the use of medicines, exercises, assistive devices and equipment, and other approaches.

American Board of Physical Medicine and Rehabilitation (ABPMR) <http://www.abpmr.org>

American Congress of Rehabilitation Medicine (ACRM)
<http://www.acrm.org>

Commission on Accreditation of Rehabilitation Facilities (CARF) <http://www.carf.org>

Institute for Rehabilitation and Research, The (TIRR)
<http://www.tirr.org>

International Society of Physical Medicine and Rehabilitation (ISPRM) <http://www.isprm.org>

National Rehabilitation Association (NRA)
<http://www.nationalrehab.org>

National Rehabilitation Counseling Association (NRCA)
<http://www.nrca-net.org>

National Rehabilitation Information Center
<http://www.naric.com>

See also Chiropractic Care; Chronic Diseases; Disability

189. Physicians

Physicians are medical doctors who work to promote and maintain health through the diagnosis and treatment of injuries and disease.

American Academy of Family Physicians (AAFP)
<http://www.aafp.org>

American College of Physicians (ACP)
<http://www.acponline.org>

American Medical Association (AMA)
<http://www.ama-assn.org>

American Medical Students Association (AMSA)
<http://www.amsa.org>

American Osteopathic Association (AOA)
<http://www.osteopathic.org>

National Medical Association (NMA)
<http://www.nmanet.org>

See also Academic Medical Centers; Hospitals; Osteopathic Medicine; Surgery and Surgeons

190. Population Estimates

Population estimates include data on populations and demographic characteristics.

U.S. Census Bureau Population Estimates Data Sets
<http://www.census.gov/popest/datasets.html>

See also Federal Government; Health Surveys; Vital Statistics

191. Preferred Provider Organizations (PPO)

Preferred provider organizations are a type of managed care plan where physicians, hospitals, and other health-care providers are contracted to provide care to a group of patients at a reduced rate. Preferred provider organizations may also allow patients to use health-care providers outside of the network but at a higher out-of-pocket cost.

American Association of Preferred Provider Organizations (AAPPO) <http://www.aappo.org>

See also Health Insurance; Managed Care

192. Prevention and Health Promotion

Prevention and health promotion works to improve the health of individuals by preventing the occurrence of disease and injury.

American Board of Preventive Medicine (ABPM) <http://www.abprevmed.org>

American College of Preventive Medicine (ACPM) <http://www.acpm.org>

Canadian Task Force on Preventive Health Care <http://www.ctfphc.org>

CDC National Prevention Information Network (CDC NPIN) <http://www.cdcnpin.org>

Center for Adolescent Health, School of Public Health, Johns Hopkins University <http://www.jhsph.edu/adolescenthealth>

Office of Disease Prevention and Health Promotion <http://odphp.osophs.dhhs.gov>

Partnership for Prevention <http://www.prevent.org>

See also Diet and Nutrition; Fitness and Exercise; Immunization and Vaccination; Public Health

193. Psychiatric Care

Psychiatric care works to treat and provide for patients who have mental health conditions.

American Academy of Child and Adolescent Psychiatry (AACAP) <http://www.aacap.org>

American Association for Geriatric Psychiatry (AAGP) <http://www.aaggpa.org>

National Association of Psychiatric Health Systems <http://www.naphs.org>

See also Mental Health

194. Public Health

Public health is the discipline that works to promote the health and extend the lives of populations through the prevention and treatment of disease.

American Public Health Association (APHA) <http://www.apha.org>

Association of State and Territorial Dental Directors (ASTDD) <http://www.astdd.org>

Association of State and Territorial Health Officials (ASTHO) <http://www.astho.org>

Canadian Public Health Association (CPHA) <http://www.cpha.ca>

European Public Health Association (EUPHA) <http://www.eupha.org>

National Association of City and County Health Officials (NACCHO) <http://www.naccho.org>

Pan American Health Organization (PAHO) <http://www.paho.org>

Public Health Association of Australia (PHAA) <http://www.phaa.net.au>

Public Health Agency of Canada <http://www.phac-aspc.gc.ca/chn-rcs/index-eng.php>

United Kingdom Public Health Association (UKPHA) <http://www.ukpha.org.uk>

World Health Organization (WHO) <http://www.who.int>

See also Centers for Disease Control and Prevention (CDC); Environmental Health Epidemiology; World Health Organization (WHO)

195. Public Health, Associations of Schools of

The list of associations of schools of public health includes organizations that represent schools and programs of public health.

Association of Schools of Public Health (ASPH) <http://www.asph.org>

Council on Education for Public Health (CEPH) <http://www.ceph.org>

Society of Public Health Education <http://www.sophe.org>

See also Public Health; Public Health, Schools of

196. Public Health, Schools of

Schools of Public Health conduct research and provide education and training for students to enter a professional career in public health that leads to a master's or doctoral degree.

Alabama

University of Alabama at Birmingham School of Public Health, Birmingham, AL <http://www.soph.uab.edu>

Arizona

University of Arizona Mel and Enid Zuckerman College of Public Health, Tucson, AZ
<http://www.publichealth.arizona.edu>

Arkansas

University of Arkansas for Medical Sciences Fay W. Boozman College of Public Health, Little Rock, AR
<http://www.uams.edu/coph>

California

Loma Linda University School of Public Health, Loma Linda, CA <http://www.llu.edu/llu/sph>

San Diego State University Graduate School of Public Health, San Diego, CA <http://publichealth.sdsu.edu>

University of California at Berkeley School of Public Health, Berkeley, CA <http://sph.berkeley.edu>

University of California at Los Angeles School of Public Health, Los Angeles, CA <http://www.ph.ucla.edu>

Connecticut

University of Connecticut Graduate Program in Public Health, Farmington, CT <http://grad.uchc.edu>

Yale School of Public Health, New Haven, CT
<http://publichealth.yale.edu>

District of Columbia

George Washington University School of Public Health and Health Services, Washington, DC
<http://www.gwumc.edu/sphhs>

Florida

Florida International University Robert Stempel School of Public Health, Miami, FL <http://chua2.fiu.edu/SSPH>

University of Florida College of Public Health and Health Professions, Gainesville, FL <http://www.phhp.ufl.edu>

University of South Florida College of Public Health, Tampa, FL <http://publichealth.usf.edu>

Georgia

Emory University Rollins School of Public Health, Atlanta, GA <http://www.sph.emory.edu>

University of Georgia College of Public Health, Athens, GA <http://www.publichealth.uga.edu>

Illinois

University of Illinois at Chicago School of Public Health, Chicago, IL <http://www.uic.edu/sph/index.shtml>

Iowa

University of Iowa College of Public Health, Iowa City, IA
<http://www.public-health.uiowa.edu>

Kentucky

University of Kentucky College of Public Health, Lexington, KY <http://www.mc.uky.edu/publichealth>

Louisiana

Louisiana State University Health Sciences Center School of Public Health, New Orleans, LA
<http://publichealth.lsuhscc.edu>

Tulane University School of Public Health and Tropical Medicine, New Orleans, LA <http://www.sph.tulane.edu>

Maryland

Johns Hopkins Bloomberg School of Public Health, Baltimore, MD <http://www.jhsph.edu>

University of Maryland Baltimore School of Public Health, Baltimore, MD <http://www.sph.umaryland.edu>

Massachusetts

Boston University School of Public Health, Boston, MA
<http://www.bu.edu/sph>

Harvard School of Public Health, Boston, MA
<http://www.hsph.harvard.edu>

University of Massachusetts School of Public Health and Health Sciences, Amherst, MA
<http://www.umass.edu/sphhs/index.html>

Michigan

University of Michigan School of Public Health, Ann Arbor,
MI <http://www.sph.umich.edu>

Minnesota

University of Minnesota School of Public Health, Minneapolis,
MN <http://www.sph.umn.edu>

Missouri

Saint Louis University School of Public Health, St. Louis,
MO <http://publichealth.slu.edu>

New Jersey

University of Medicine and Dentistry of New Jersey-School of
Public Health, Piscataway, NJ <http://sph.umdnj.edu>

New York

Columbia University Mailman School of Public Health, New
York, NY <http://www.mailman.hs.columbia.edu>

New York Medical College School of Public Health, Valhalla,
NY <http://www.nymc.edu/sph>

University at Albany SUNY School of Public Health,
Rensselaer, NY <http://www.albany.edu/sph>

North Carolina

University of North Carolina at Chapel Hill School of Public
Health, Chapel Hill, NC <http://www.sph.unc.edu>

Ohio

Ohio State University School of Public Health, Columbus,
OH <http://sph.osu.edu>

Oklahoma

University of Oklahoma College of Public Health, Oklahoma
City, OK <http://www.ouhsc.edu>

Pennsylvania

Drexel University School of Public Health,
Philadelphia, PA <http://publichealth.drexel.edu>

University of Pittsburgh Graduate School of Public Health,
Pittsburgh, PA <http://www.publichealth.pitt.edu>

South Carolina

University of South Carolina Arnold School of Public Health,
Columbia, SC <http://www.sph.sc.edu>

Tennessee

University of Louisville School of Public Health and
Information Science, Louisville, TN
<http://www.louisville.edu/hsc/sphis>

Texas

Texas A&M School of Rural Public Health, Bryan, TX
<http://www.srph.tamhsc.edu>

University of North Texas Health Science Center School of
Public Health, Fort Worth, TX
<http://www.hsc.unt.edu/education/sph>

University of Texas School of Public Health, Houston, TX
<http://www.sph.uth.tmc.edu>

Washington

University of Washington School of Public Health and
Community Medicine, Seattle, WA
<http://sphcm.washington.edu>

See also Public Health; Public Health, State Departments of

197. Public Health, State Departments of

State departments of public health provide a vital function to keep residents of states healthy through health promotion and disease prevention activities.

Alabama Department of Public Health <http://www.adph.org>

Alaska Department of Health and Social Services
<http://www.hss.state.ak.us>

Arkansas Department of Health
<http://www.healthylarkansas.com>

Arizona Department of Health Services
<http://www.hs.state.az.us>

California Department of Health Services
<http://www.dhs.ca.gov>

Colorado Department of Public Health and Environment
<http://www.cdph.state.co.us/cdphehom.asp>

Connecticut Department of Health
<http://www.dph.state.ct.us>

- District of Columbia Department of Health
<http://www.dchealth.dc.gov/doh/site/default.asp>
- Florida Department of Health <http://www.doh.state.fl.us>
- Georgia Division of Public Health <http://health.state.ga.us>
- Hawaii Department of Health <http://www.hawaii.gov/health>
- Idaho Department of Health and Welfare
<http://www.healthandwelfare.idaho.gov>
- Illinois Department of Public Health
<http://www.idph.state.il.us>
- Indiana State Department of Health <http://www.in.gov/isdh>
- Iowa Department of Health <http://www.idph.state.ia.us>
- Kansas Department of Health and Environment
<http://www.kdheks.gov>
- Kentucky Department of Public Health
<http://www.publichealth.state.ky.us>
- Louisiana Department of Health and Hospitals, Office of Public Health
<http://www.oph.dhh.state.la.us>
- Maryland Department of Health and Mental Hygiene
<http://www.dhmmh.state.md.us>
- Massachusetts Department of Health
<http://www.state.ma.us/dph.dphhome.htm>
- Michigan Department of Public Health
<http://www.michigan.gov/mdch>
- Minnesota Department of Public Health
<http://www.health.state.mn.us>
- Mississippi Department of Health
<http://www.msdh.state.ms.us/msdhsite/index.cfm>
- Missouri Department of Health <http://www.dhss.mo.gov>
- Montana Department of Health <http://www.dphhs.state.mt.us>
- Nebraska Department of Health <http://www.hhs.state.ne.us>
- Nevada State Health Division <http://www.health2k.state.nv.us>
- New Hampshire Department of Health and Human Services
<http://www.dhhs.state.nh.us>
- New Jersey Department of Health and Senior Services
<http://www.state.nj.us/health>
- New Mexico Department of Health
<http://www.health.state.nm.us>
- New York State Department of Health
<http://www.health.state.ny.us>
- North Carolina Department of Public Health
<http://www.dhhs.state.nc.us/dph>
- North Dakota Department of Health
<http://www.health.state.nd.us>
- Ohio Department of Health <http://www.odh.state.oh.us>
- Oklahoma State Department of Health
<http://www.health.state.ok.us>
- Oregon Department of Human Resources
<http://www.ohd.hr.state.or.us>
- Pennsylvania Department of Health
<http://www.health.state.pa.us>
- Rhode Island Department of Health
<http://www.health.state.ri.us>
- South Carolina Department of Health and Environmental Control
<http://www.dhhs.state.sc.us>
- South Dakota Department of Health
<http://www.state.sd.us/doh>
- Tennessee Department of Health <http://www.state.tn.us>
- Texas Department of Health <http://www.dshs.state.tx.us>
- Utah Department of Health <http://www.health.utah.gov>
- Vermont Department of Health
<http://healthvermont.gov>
- Virginia Department of Health <http://www.vdh.state.va.us>
- Washington State Department of Health
<http://www.doh.wa.gov>
- Wisconsin Department of Health and Family Services
<http://www.dhfs.state.wi.us>
- Wyoming Department of Health <http://wdh.state.wy.us>
- See also* Public Health; State and County Government Organizations; Vital Statistics

198. Quality Assurance

Quality assurance is the systematic process of ensuring that healthcare products and services meet certain standards.

American Board of Quality Assurance and Utilization Review Physicians (ABQAURP) <http://www.abqaurp.org>

American Health Quality Association (AHQA)
<http://www.ahqa.org>

Michigan Quality Council (MQC)
<http://www.michiganquality.org>

National Association for Healthcare Quality (NAHQ)
<http://www.nahq.org>

National Committee for Quality Assurance (NCQA) (The NCQA publishes the Health Plan Employer Data and Information Set HEDIS) <http://www.ncqa.org>

See also Accreditation, Certification, and Licensing; Hospitals; Medical Malpractice; Quality of Healthcare

199. Quality of Healthcare

Quality of healthcare can have different meanings to different individuals; however, it broadly refers to receiving appropriate care at the right time in the right amount.

Agency for Healthcare Quality and Research (AHRQ)
<http://www.ahrq.gov>

Bridges to Excellence <http://www.bridgestoexcellence.org>

Consumer Coalition for Quality Health Care
<http://www.consumers.org>

Doctorquality.com <http://www.doctorquality.com>

European Society for Quality in Healthcare (ESQH)
<http://www.esqh.net>

Foundation for Accountability (FACCT)
<http://www.markle.org/resources/facct/index.php>

Institute for Clinical Systems Improvement (ICSI)
<http://www.icsi.org>

Institute for Healthcare Improvement (IHI) <http://www.ihl.org>

Irish Society for Quality and Safety in Healthcare (ISQSH)
<http://www.isqsh.ie>

Joint Commission <http://www.jointcommission.org>

National Initiative for Children's Healthcare Quality (NICHQ) <http://www.nichq.org>

National Quality Forum (NQF) (NQF was formerly the National Forum for Health Care Quality Measurement and Reporting) <http://www.qualityforum.org>

National Quality Measures Clearinghouse (NQMC)
<http://www.qualitymeasures.ahrq.gov>

See also Health Outcomes; Medical Errors; Pain; Patient Safety

200. Randomized Controlled Trials (RCT)

Randomized controlled trials (sometimes called clinical trials) is a type of study that is conducted to evaluate the safety and efficacy of new drugs or interventions.

AIDS Clinical Trials Group (ACTG) <http://www.aactg.org>

American Society for Clinical Investigation (ASCI)
<http://www.asci-jci.org>

Association for the Accreditation of Human Research Protection Programs (AAHRPP) <http://www.aahrpp.org>

Centerwatch Clinical Trials Listing Service
<http://www.centerwatch.com>

National Institutes of Health (NIH) and National Library of Medicine (NLM) <http://www.clinicaltrials.gov>

Society for Clinical Trials (SCT) <http://www.sctweb.org>

See also Clinical Practice Guidelines; Drugs; Epidemiology; Evidence-Based Medicine (EBM); Health Outcomes

201. Rare Diseases

Rare diseases are conditions that have a low prevalence. Rare diseases may be caused genetically and can be life threatening or chronically disabling in nature.

National Organization for Rare Disorders (NORD)
<http://www.rarediseases.org>

See also Epidemiology; Genetics; Health Surveys; National Institutes of Health (NIH)

202. Regulation

Regulations are legal restrictions that are made by the government and they may include sanctions.

Regulatory Affairs Professionals Society (RAPS) <http://raps.org>

See also Centers for Medicare and Medicaid Services (CMS); Certificate of Need (CON); Health Law

203. Rural Health

Rural health involves the study of the needs and delivery of healthcare in rural areas.

National Advisory Committee on Rural Health and Human Services, Office of Rural Health Policy, Health Resources and Services Administration (HRSA) <http://ruralcommittee.hrsa.gov/index.htm>

National Association of Rural Health Clinics (NARHC)
<http://www.narhc.org>

National Center for Farmworker Health (NCFH)
<http://www.ncfh.org>

National Rural Health Association (NRHA)
<http://www.nrharural.org>

Nebraska Center for Rural Health Research, University of Nebraska Medical Center <http://www.unmc.edu/rural>

Office of Rural Health Policy, Health Resources and Services Administration (HRSA) <http://ruralhealth.hrsa.gov>

Rural Assistance Center <http://www.raconline.org>

Rural Information Center, U.S. Department of Agriculture <http://www.nal.usda.gov/ric>

See also Federal Government; Hospitals; Physicians; Public Health

204. Safety Net

Healthcare safety net is the healthcare system that provides care for the poor and vulnerable populations.

Healthcare Safety Net Program, Agency for Healthcare Research and Quality (AHRQ)
<http://www.ahrq.gov/data/safetynet/netfact.htm>

See also Community Health Centers (CHCs); Hospitals; Physicians

205. Self-Help

Self-help is the self-reliability to gain publicly available information or the use of support groups.

American Self-Help Group Clearinghouse
<http://www.selfhelpgroups.org>

National Mental Health Consumer's Self-Help Clearinghouse (NSHC) <http://www.mhselfhelp.org>

See also Diet and Nutrition; Fitness and Exercise; Prevention and Health Promotion

206. Spinal Disorders and Injuries

Spinal disorders and injuries are conditions that affect the spinal cord.

American Paraplegia Society (APS) <http://www.apssci.org>

National Spinal Cord Injury Association (NSCIA)
<http://www.spinalcord.org>

North American Spine Society (NASS) <http://www.spine.org>

Spinal Cord Society (SCS) <http://scsus.org>

See also Chronic Diseases; Disability; Physical and Rehabilitation Medicine

207. State and County Data Sources

State and county data sources are sources of health and demographic information at the state or county level.

Area Resource File (ARF) <http://www.arfsys.com>

Dartmouth Atlas of Health Care
<http://www.dartmouthatlas.org>

State Health Facts Online
<http://www.statehealthfacts.org>

See also Health Statistics and Data Sources; Health Surveys; Vital Statistics

208. State and County Government Organizations

State and county government organizations represent groups of state and county-level government employees.

Association of State and Territorial Dental Directors (ASTDD)
<http://www.astdd.org>

Association of State and Territorial Health Officials (ASTHO)
<http://www.astho.org>

Information for State Health Policy
<http://www2.umdnj.edu/ishppweb/homepage.htm>

National Academy for State Health Policy (NASHP)
<http://www.nashp.org>

National Association of County and City Health Officials (NACCHO) <http://www.naccho.org>

National Association of State Budget Officers (NASBO)
<http://www.nasbo.org>

National Association of State Medicaid Directors
<http://www.nasmd.org>

National Conference of State Legislatures (NCSL)
<http://www.ncsl.org>

National Governors Association (NGA) <http://www.nga.org>

State Health Facts Online (This website is produced by the Kaiser Family Foundation)
<http://www.statehealthfacts.kff.org>

Stateline.org (This site is produced by the Pew Center on the States) <http://www.stateline.org>

See also Health Statics and Data Sources; Public Health

209. State Children's Health Insurance Program (SCHIP)

The State Children's Health Insurance Program is a federal health program that provides funding to the states to insure families with children that have a modest income but do not qualify for Medicaid.

Centers for Medicare and Medicaid (CMS)
<http://www.cms.hhs.gov/home/schip.asp>

Medicaid/SCHIP, Henry J. Kaiser Family Foundation (KFF) <http://www.kff.org/medicaid/index.cfm>

National Academy for State Health Policy (NASHP)
 CHIPCentral.org <http://www.chipcentral.org>

National Conference of State Legislatures (NCSL)
<http://www.ncsl.org/programs/health/chiphome.htm>

National Health Policy Forum (NHFP) <http://www.nhpf.org/index.cfm?fuseaction=SearchCatalogue&ciissueid=3>

SCHIP and Public Health, American Public Health Association (APHA) <http://www.apha.org/advocacy/priorities/schip>

State Access to Children's Health Insurance, American Academy of Pediatrics (AAP) <http://www.aap.org/advocacy/staccess.htm>

U.S. Government Info/Resources <http://usgovinfo.about.com/od/medicarehealthinsurance/a/schip.htm>

See also Centers for Medicare and Medicaid Services (CMS); Child Development and Health; Health Insurance; Medicaid

210. Stroke

Stroke is a condition when the blood flow to the brain is disrupted either because of a blockage or hemorrhage of the blood vessels. Stroke can result in the loss of brain function and paralysis of the body.

American Stroke Association (ASA) <http://www.strokeassociation.org>

Division for Heart Disease and Stroke Prevention, Centers for Disease Control and Prevention (CDC) <http://www.cdc.gov/DHDSP>

The Internet Stroke Center, Washington University, St. Louis, MO <http://www.strokecenter.org>

National Institute of Neurological Disorders and Stroke (NINDS) <http://www.ninds.nih.gov>

National Stroke Association (NSA) <http://www.stroke.org>

The Stroke Association <http://www.stroke.org.uk>

See also Aging; Disability; Chronic Diseases; Hypertension; Physical Medicine and Rehabilitation

211. Substance Abuse

Substance abuse is the overuse or dependence on a drug or chemical that results in negative physical or mental health consequences that may affect the welfare of others. Substance abuse can result in drug addiction and physiological or behavioral problems.

American Society of Addiction Medicine (ASAM) <http://www.asam.org>

Association for Addiction Professionals (NAADAC) (The association was formerly the National Association of Alcoholism and Drug Abuse Counselors) <http://www.naadac.org>

Center for Substance Abuse Prevention (CSAP) <http://www.prevention.samhsa.gov>

National Clearinghouse for Alcohol and Drug Information (NCADI) <http://www.health.org>

National Institute on Drug Abuse <http://www.nida.nih.gov>

See also Alcoholism; Federal Government; Public Health; Tobacco Use

212. Surgery and Surgeons

Surgery is a specialty of medicine that uses both manual and invasive techniques to treat or explore disease or injuries to the body, help the body to improve in its form or function, and other reasons. Surgeons are healthcare providers who perform surgeries.

American College of Surgeons (ACS) <http://www.facs.org>

Association for Academic Surgery (AAS) <http://www.aasurg.org>

International College of Surgeons (ICS) <http://www.icsglobal.org>

Tests and Procedures, MedlinePlus <http://www.nlm.nih.gov/medlineplus/tutorial.html>

YourSurgery <http://www.yoursurgery.com>

See also Ambulatory Surgery Centers; Cosmetic and Plastic Surgery; Neurosurgery; Physicians

213. Technology Assessment

Technology assessment is the examination and evaluation of new technologies.

Agency for Healthcare Research and Quality (AHRQ) <http://www.ahrq.gov>

Canadian Agency for Drugs and Technologies in Health (CADTH) <http://www.cadth.ca>

Canadian Medical Devices Conformity Assessment System http://www.hc-sc.gc.ca/dhp-mps/md-im/qualsys/cmdcas_scecim_syst_pol-eng.php

ECRI Institute <http://www.ecri.org>

NIHR Health Technology Assessment Programme <http://www.inahta.org>

National Coordinating Centre for Health Technology Assessment (NCCHTA) <http://www.hta.nhs.uk>

National Information Center on Health Services Research and Health Care Technology (NICHSR) <http://www.nlm.nih.gov/nichsr>

Swedish Council on Technology Assessment in Health Care
<http://www.sbu.se>

See also Cost-Benefit and Cost-Effectiveness Analysis; Drugs;
 Randomized Controlled Trials (RCT)

214. Telemedicine

Telemedicine is the application of clinical practices through the use of network systems such as the telephone, Internet, or other technologies.

American Telemedicine Association (ATA)
<http://www.americantelemed.org>

Association of Telehealth Service Providers (ATSP)
<http://www.atasp.org>

Office for the Advancement of Telehealth, Health Resources and Services Administration (HRSA)
<http://www.hrsa.gov/telehealth>

Telemedicine and Telehealth Resources, Indian Health Service (IHS) http://www.ihs.gov/NonMedicalPrograms/DFEE/telemed/default.cfm?content=resources_page_1.htm

See also E-Health; Informatics; Information Technology (IT)

215. Tobacco Use

Tobacco use includes the smoking and consumption of tobacco products that may be done as part of recreational drug use.

Action on Smoking and Health (ASH) <http://www.ash.org>

American Cancer Society <http://www.cancer.org>

American Heart Association <http://www.americanheart.org>

American Lung Association <http://www.lungusa.org>

Americans for Nonsmokers' Rights Foundation (ANR)
<http://www.no-smoke.org>

Foundation for a Smoke Free America
<http://www.notobacco.org>

Office on Smoking and Health, Centers for Disease Control and Prevention (CDC) <http://www.cdc.gov/tobacco>

See also Cancer; Lung Diseases; Public Health; Substance Abuse

216. Uninsured Individuals

The uninsured include groups of individuals who do not have any health insurance or who have decreased access to appropriate healthcare services.

Alliance for Health Reform <http://www.allhealth.org>

Association of Clinicians for the Underserved (ACU)
<http://www.clinicians.org>

Center for Studying Health System Change (HSC)
<http://www.hschange.com>

Covering the Uninsured <http://www.coveringtheuninsured.org>

Economic Research Initiative on the Uninsured (ERIU),
 University of Michigan, Ann Arbor, MI
<http://www.umich.edu/~eriu>

Henry J. Kaiser Family Foundation (KFF) <http://www.kff.org>

State Access to Children's Health Insurance, American Academy of Pediatrics
<http://www.aap.org/advocacy/staccess.htm>

Urban Institute <http://www.urban.org>

See also Health Disparities; Health Insurance; Healthcare Financial Management; National Health Insurance

217. United Kingdom Healthcare Organizations

The United Kingdom (UK) healthcare organizations include organizations in the UK that are related to health and healthcare.

National Electronic Library for Health <http://www.library.nhs.uk>

National Health Service (NHS) <http://www.nhs.uk>

National Institute for Clinical Excellence (NICE)
<http://www.nice.org.uk>

Nuffield Trust for Research and Policy Studies in Health Services <http://www.nuffieldtrust.org.uk>

The Stroke Association <http://www.stroke.org.uk>

UK Health Informatics Society (UKHIS) <http://ukhis.org.uk>

See also International Health Systems; World Health Organization (WHO)

218. Veterans Health

Veterans health includes healthcare programs that are targeted to veterans of the military.

Department of Veterans Affairs (VA) <http://www.va.gov>

National Association of State Veterans Homes (NASVH)
<http://www.nasvh.org>

National Center for Health Promotion and Disease Prevention <http://www.prevention.va.gov>

VA National Center for Patient Safety
<http://www.patientsafety.gov>

Veterans Health Administration (VHA)
<http://www1.va.gov/health>

See also Federal Government; Hospitals; Military Health Systems

219. Vital Statistics

Vital statistics are the records of births, deaths, marriages, and divorces.

Birth Data <http://www.cdc.gov/nchs/births.htm>

Fetal Deaths <http://www.cdc.gov/nchs/about/major/fetaldth/abfetal.htm>

Marriage and Divorce <http://www.cdc.gov/nchs/pressroom/96facts/mardiv.htm>

Mortality Data <http://www.cdc.gov/nchs/deaths.htm>

National Death Index <http://www.cdc.gov/nchs/ndi.htm>

National Vital Statistics System, National Center for Health Statistics (NCHS) <http://www.cdc.gov/nchs/nvss.htm>

See also Epidemiology; Public Health; Public Health, State Departments of; State and County Data Sources

220. Women's Health Issues

Women's health represents the unique health needs of women and it works to address the disparities in health between men and women.

Association of Women's Health, Obstetric and Neonatal Nurses (AWHONN) <http://www.awhonn.org>

Canadian Women's Health Network (CWHN)
<http://www.cwhn.ca/indexeng.html>

Foundation for Women's Health Research and Development (FORWARD) <http://www.forwarduk.org.uk>

Global Alliance for Women's Health (GAWH)
<http://www.gawh.org>

Institute for Women's Policy Research (IWPR)
<http://www.iwpr.org>

International Women's Health Coalition (IWHC)
<http://www.iwhc.org>

National Black Women's Health Imperative
<http://www.blackwomenshealth.org>

National Organization for Women (NOW) <http://www.now.org>

National Partnership for Women and Families
<http://www.nationalpartnership.org>

National Program on Women and Aging, The Heller School for Social Policy and Management, Brandeis University, Waltham, MA <http://iasp.brandeis.edu/womenandaging/index.html>

National Women's Health Information Center
<http://www.womenshealth.gov>

Society for Women's Health Research (SWHR)
<http://www.womenshealthresearch.org>

Women's and Children's Health Policy Center, School of Public Health, Johns Hopkins University
<http://www.jhsph.edu/wchpc>

Women's Health <http://www.womenshealthlondon.org.uk>

See also Arthritis and Rheumatism; Childbirth; Child Development and Health; Chronic Diseases; Osteoporosis; Public Health

221. Workers' Compensation

Workers' compensation is a type of state-based insurance that provides compensation and medical care to employees who are injured working on the job.

American Academy of Disability Evaluating Physicians (AADEP)
<http://www.aadep.org>

Office of Workers' Compensation Programs, U.S. Department of Labor http://www.dol.gov/esa/owcp_org.htm

See also Health Insurance; Health Law; Injury; Occupational Medicine

222. World Health Organization (WHO)

The World Health Organization, based in Geneva, Switzerland, is an agency of the United Nations and it is the leading authority on international public health.

Headquarters

WHO Headquarters, Geneva, Switzerland
<http://www.who.int>

Regional Offices

WHO Regional Office for Africa (AFRO), Brazzaville,
Congo <http://www.afro.who.int>

WHO Regional Office for the Americas (AMRO), Pan
American Health Organization <http://www.paho.org>

WHO Regional Office for the Eastern Mediterranean
(EMRO), Alexandria, Egypt
<http://www.emro.who.int>

WHO Regional Office for Europe (EURO), Copenhagen,
Denmark <http://www.euro.who.int>

WHO Regional Office for South East Asia (SEARO), New
Delhi, India <http://www.searo.who.int>

WHO Regional Office for the Western Pacific (WPRO),
Manila, Philippines <http://www.wpro.who.int>

See also Centers for Disease Control and Prevention (CDC);
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