

# Sampling Techniques & Samples Types





## *Outlines*

- Sample definition
- Purpose of sampling
- Stages in the selection of a sample
- Types of sampling in quantitative researches
- Types of sampling in qualitative researches
- Ethical Considerations in Data Collection



# Sampling...

The process of selecting a number of individuals for a study in such a way that the individuals represent the larger group from which they were selected



➤ **A sample** is “a smaller (but hopefully representative) collection of units from a population used to determine truths about that population”

➤ **The sampling frame**

A list of all elements or other units containing the elements in a population.





## Population...

...the larger group from which individuals are selected to participate in a study

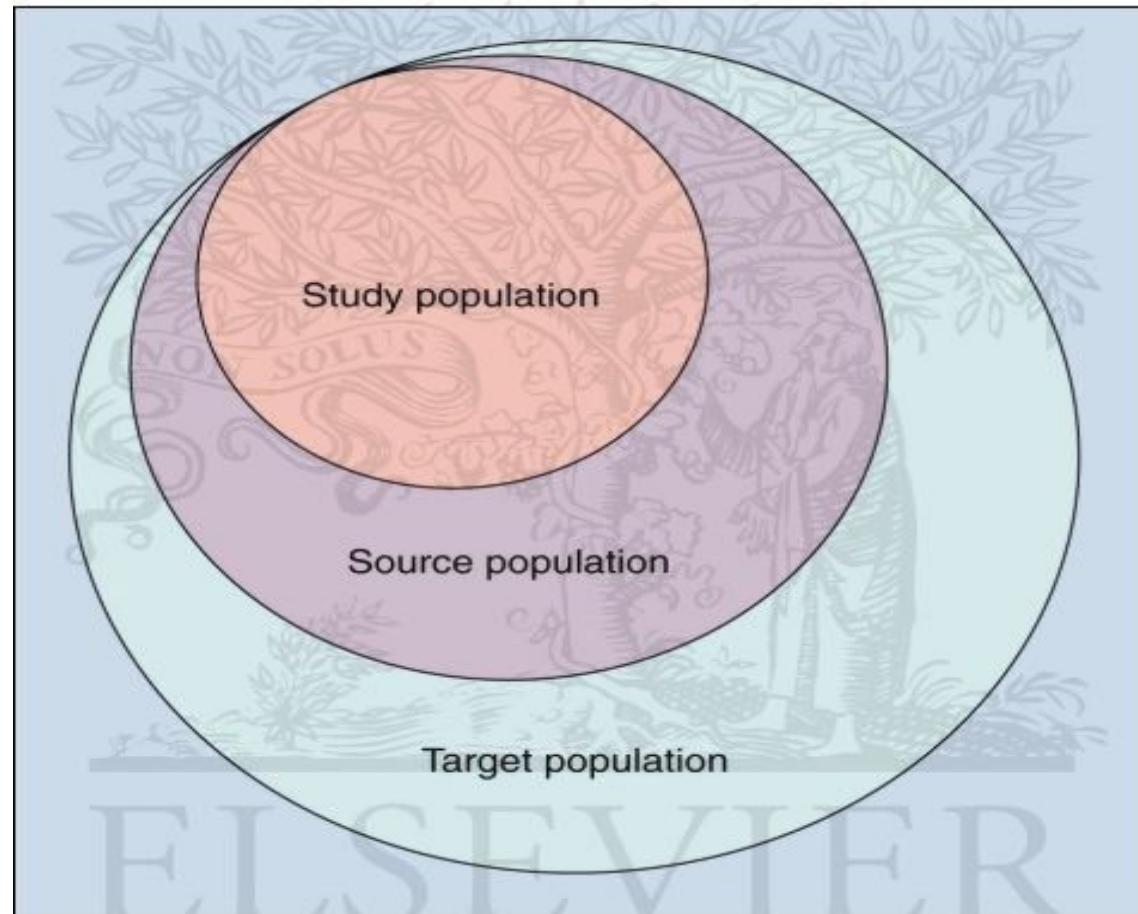


## Target population

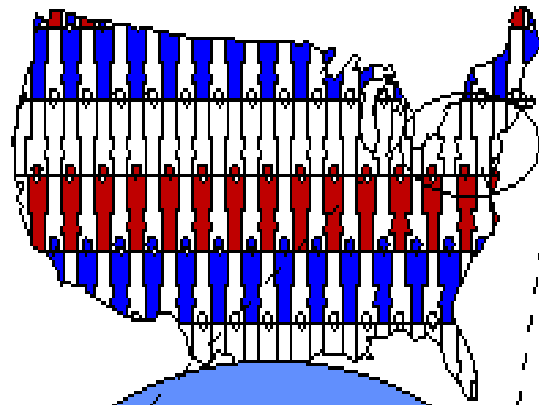
A set of elements larger than or different from the population sampled and to which the researcher would

like to generalize

study findings.

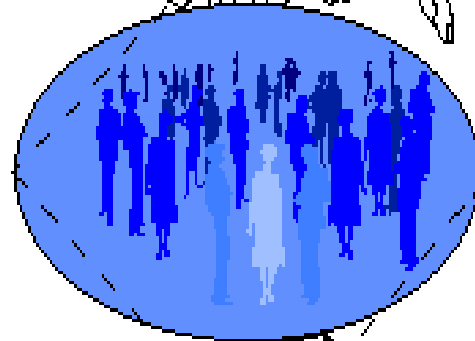


**Who do you want to generalize to?**



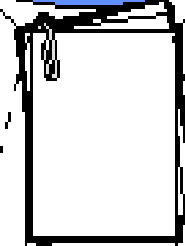
**The Theoretical Population**

**What population can you get access to?**



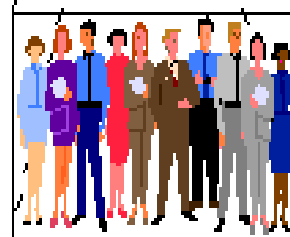
**The Study Population**

**How can you get access to them?**



**The Sampling Frame**

**Who is in your study?**



**The Sample**



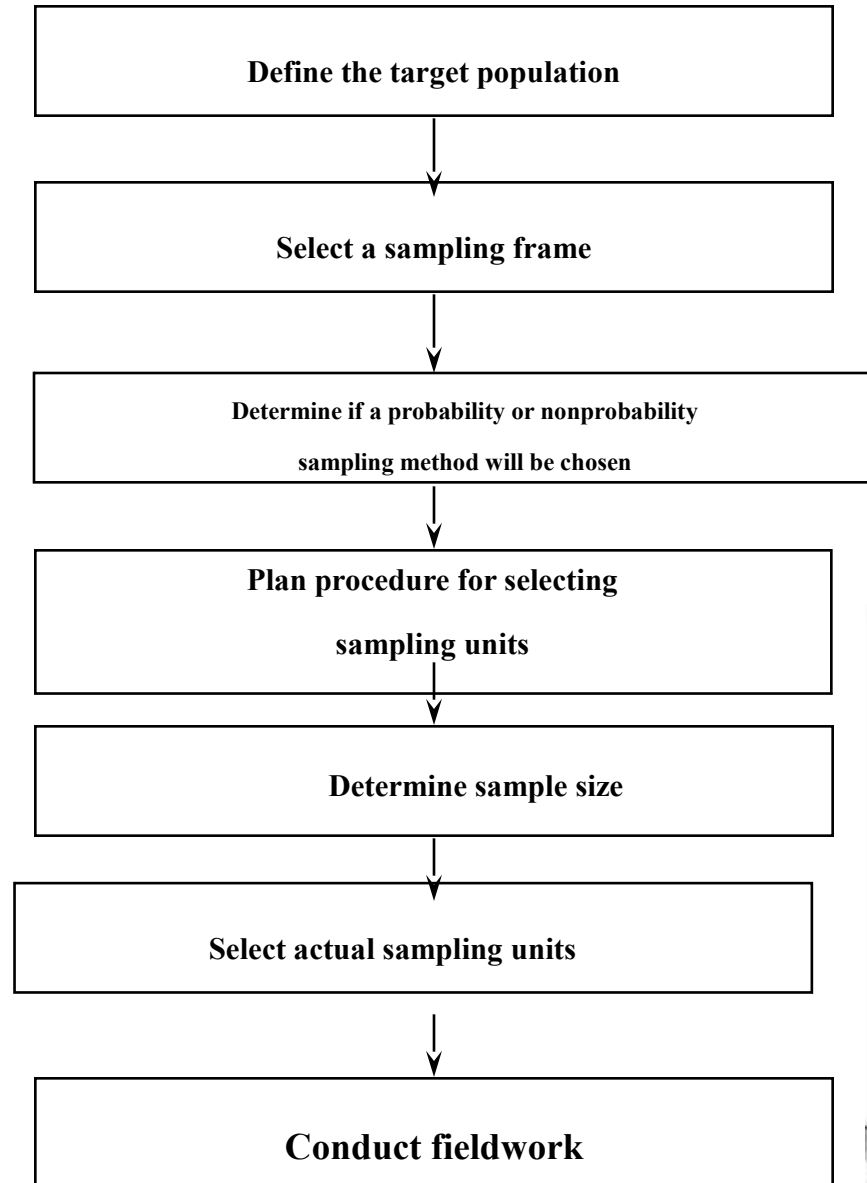
## The purpose of sampling...

- To gather data about the population in order to make an inference that can be generalized to the population





**Stages in the  
Selection  
of a Sample**



## Quantitative Sampling

- Purpose – to identify participants from whom to seek some information
- Issues
  - Nature of the sample (random samples)
  - Size of the sample
  - Method of selecting the sample



## Quantitative Sampling

### ○ Important issues

- Representation – the extent to which the sample is representative of the population
- Generalization – the extent to which the results of the study can be reasonably extended from the sample to the population
- Sampling error

The chance occurrence that a randomly selected sample is not representative of the population due to errors inherent in the sampling technique



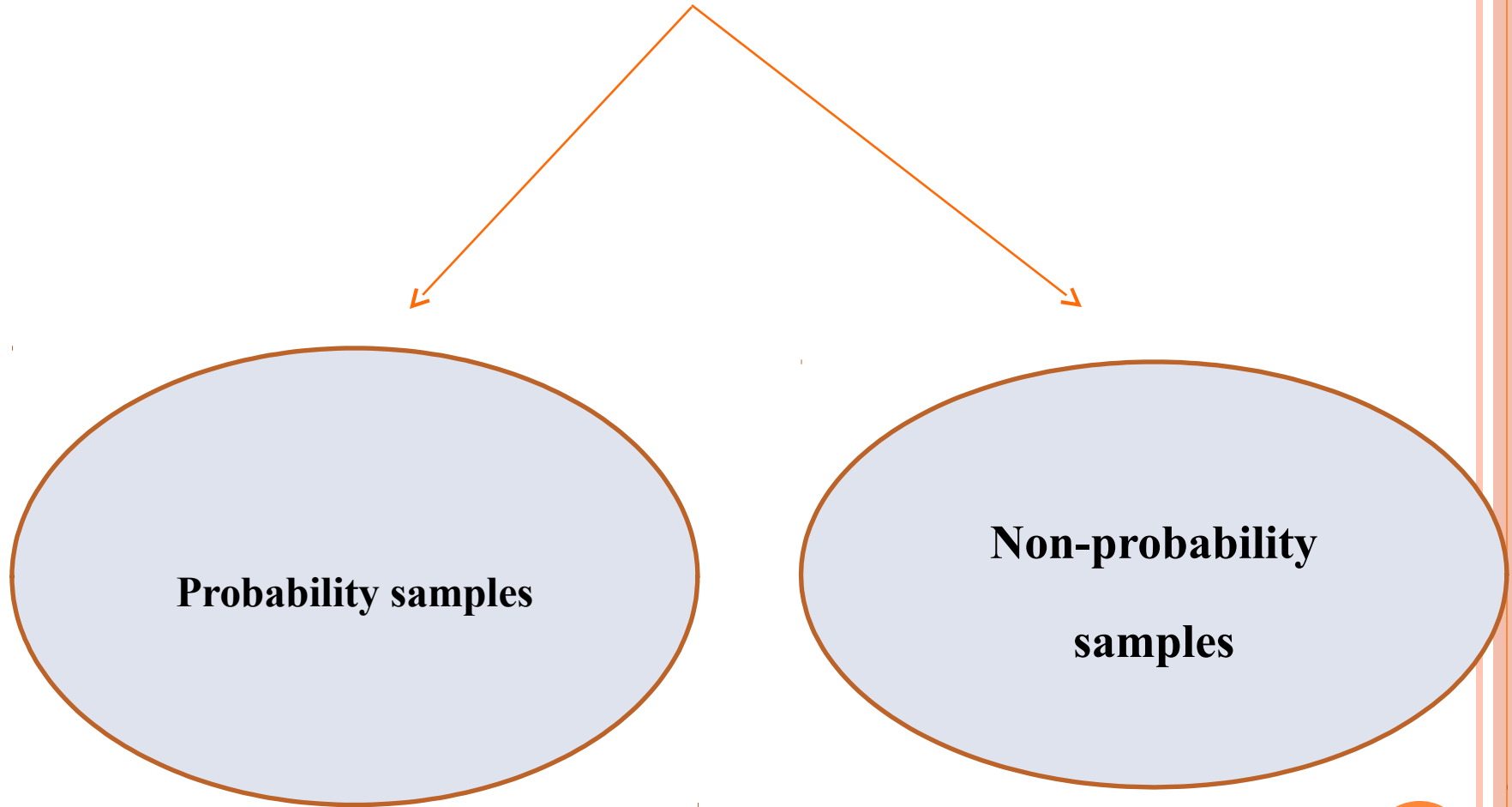
## Quantitative Sampling

### ○ Important issues (continued)

- Sampling bias
  - Some aspect of the researcher's sampling design creates bias in the data.
- Three fundamental steps
  - Identify a population
  - Define the sample size
  - Select the sample



*Types of sampling in quantitative researches*



## Probabilistic Sampling

Simple Random

Systematic  
Random

Stratified

Multi-stage  
cluster

## Non-Probabilistic Sampling

Convenience

Snowball

Quota

Theoretical



## Selecting Random Samples

- Known as probability sampling
- Best method to achieve a representative sample
- Four techniques
  1. Random
  2. Stratified random
  3. Cluster
  4. Systematic



# Selecting Random Samples

## 1. Random sampling

Selecting subjects so that all members of a population have an equal and independent chance of being selected

### ❖ Advantages

1. Easy to conduct
2. High probability of achieving a representative sample
3. Meets assumptions of many statistical procedures

### ❖ Disadvantages

1. Identification of all members of the population can be difficult
2. Contacting all members of the sample can be difficult





## Selecting Random Samples

### ○ Random sampling (continued)

- Selection process
  - Identify and define the population
  - Determine the desired sample size
  - List all members of the population
  - Assign all members on the list a consecutive number
  - Select an arbitrary starting point from a table of random numbers and read the appropriate number of digits





## Selecting Random Samples

### 2. Stratified random sampling

- The population is divided into two or more groups called strata, according to some criterion, such as geographic location, grade level, age, or income, and subsamples are randomly selected from each strata.



## Selecting Random Samples

### ○ Stratified random sampling (continued)

- Advantages
  - More accurate sample
  - Can be used for both proportional and non-proportional samples
  - Representation of subgroups in the sample
- Disadvantages
  - Identification of all members of the population can be difficult
  - Identifying members of all subgroups can be difficult



# Selecting Random Samples

## ○ Stratified random sampling (continued)

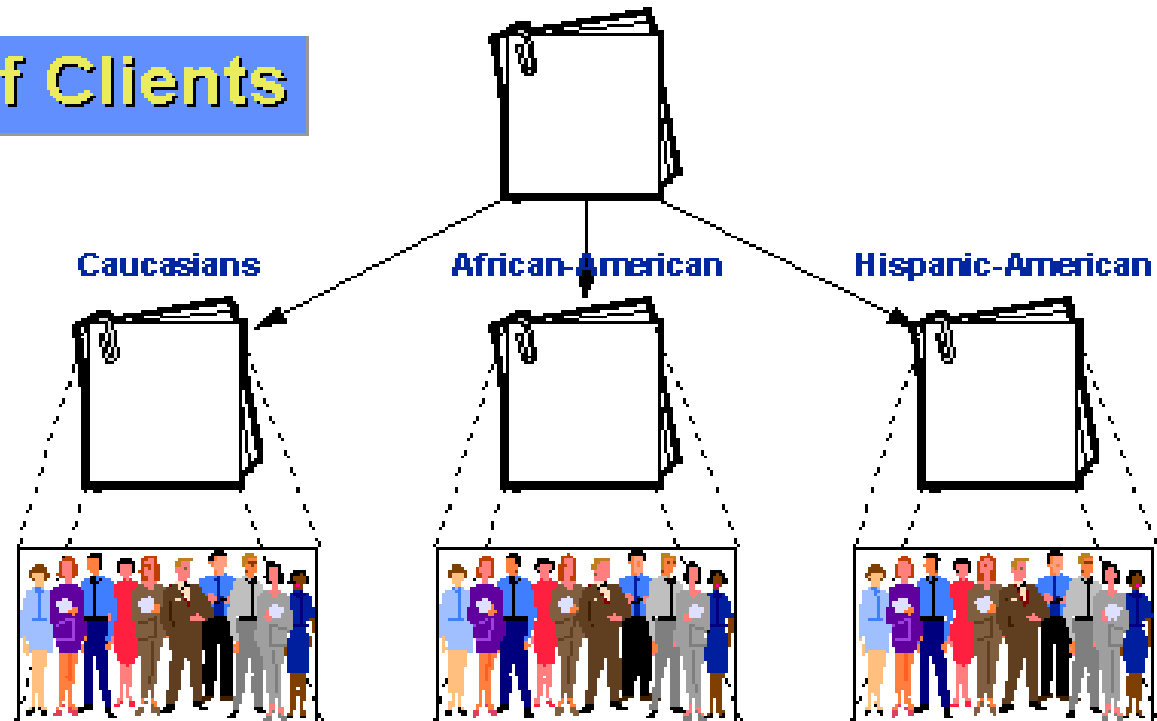
- Selection process
  - Identify and define the population
  - Determine the desired sample size
  - Identify the variable and subgroups (i.e., strata) for which you want to guarantee appropriate representation
  - Classify all members of the population as members of one of the identified subgroups



# Stratified random sampling

List of Clients

Strata





Random Subsamples of  $n/N$



# Selecting Random Samples

## 3. Cluster sampling

-  The process of randomly selecting intact groups, not individuals, within the defined population sharing similar characteristics
-  Clusters are locations within which an intact group of members of the population can be found
  - Examples
    - Neighborhoods
    - School districts
    - Schools
    - Classrooms



## Selecting Random Samples

### ○ Cluster sampling (continued)

- Advantages

- Very useful when populations are large and spread over a large geographic region
- Convenient and expedient
- Do not need the names of everyone in the population

- Disadvantages

- Representation is likely to become an issue



## Selecting Random Samples

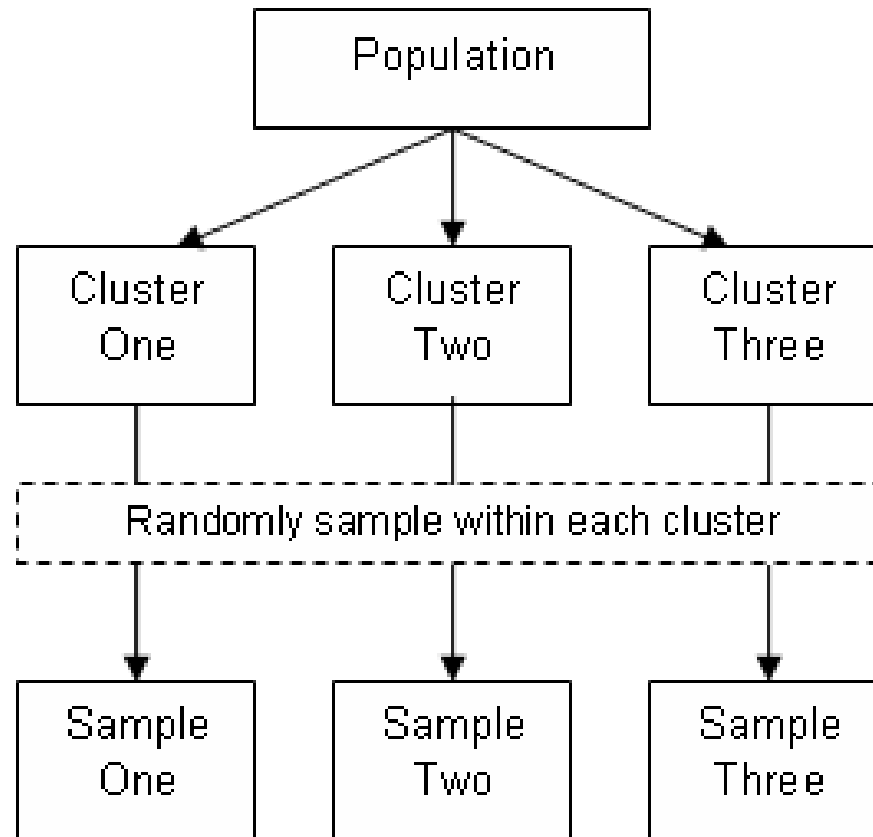
### ○ Cluster sampling (continued)

- Selection process
  - Identify and define the population
  - Determine the desired sample size
  - Identify and define a logical cluster
  - List all clusters that make up the population of clusters
  - Estimate the average number of population members per cluster
  - Determine the number of clusters needed by dividing the sample size by the estimated size of a cluster
  - Randomly select the needed numbers of clusters
  - Include in the study all individuals in each selected cluster





## Cluster sampling



## Selecting Random Samples

### 4. Systematic sampling

- Selecting every  $K^{\text{th}}$  subject from a list of the members of the population
- Advantage
  - Very easily done
- Disadvantages
  - subgroups
  - Some members of the population don't have an equal chance of being included



## Selecting Random Samples

### ○ Systematic sampling (continued)

- Selection process
  - Identify and define the population
  - Determine the desired sample size
  - Obtain a list of the population
  - Determine what  $K$  is equal to by dividing the size of the population by the desired sample size
  - Start at some random place in the population list
  - Take every  $K^{\text{th}}$  individual on the list



## Systematic sampling

- **Example**, to select a sample of 25 dorm rooms in your college dorm, makes a list of all the room numbers in the dorm. For example there are 100 rooms, divide the total number of rooms (100) by the number of rooms you want in the sample (25). The answer is 4. This means that you are going to select every fourth dorm room from the list. First of all, we have to determine the random starting point. This step can be done by picking any point on the table of random numbers, and read across or down until you come to a number between 1 and 4. This is your random starting point. For instance, your random starting point is "3". This means you select dorm room 3 as your first room, and then every fourth room down the list (3, 7, 11, 15, 19, etc.) until you have 25 rooms selected.



# SAMPLE SIZE

- According to Uma Sekaran in Research Method for Business 4th Edition, Roscoe (1975) proposed the rules of thumb for determining sample size where sample size larger than 30 and less than 500 are appropriate for most research, and the minimum size of sample should be 30% of the population.
- The size of the sample depends on a number of factors and the researchers have to give the statistically information before they can get an answer. For example, these information like (confidence level, standard deviation, margin of error and population size) to determine the sample size.



## *Types of sampling in quantitative researches*

### **Non-probability samples**

**(Random)**: allows a procedure governed by chance to select the sample; controls for sampling bias.



# Nonrandom sampling methods...

1. Convenience sampling

2. Purposive sampling

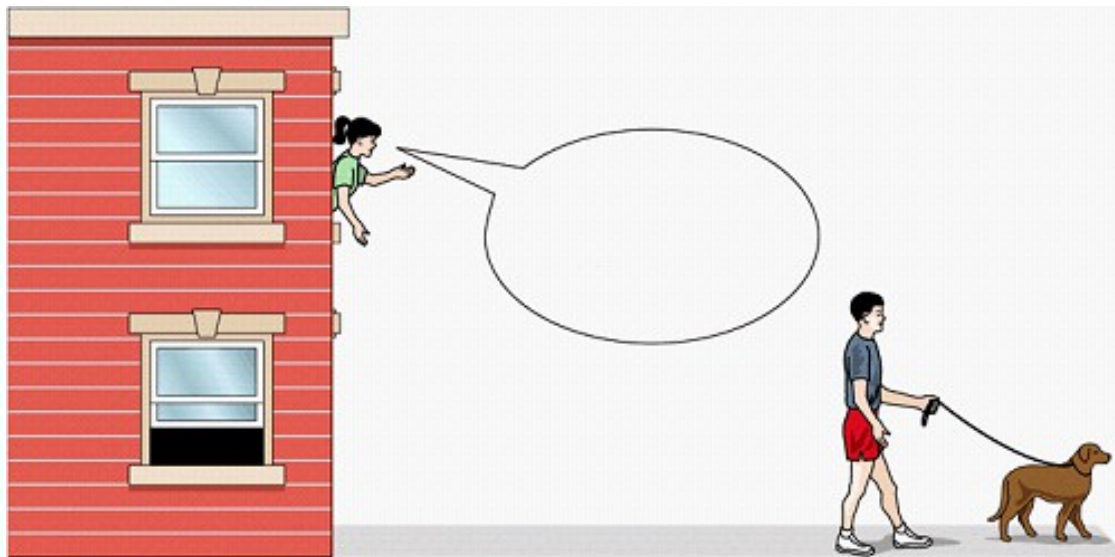
3. Quota sampling



# 1. Convenience sampling:

the process of including whoever happens to be available at the time

...called “accidental” or “haphazard” sampling





## *disadvantages...*

difficulty in determining how much of the effect (dependent variable) results from the cause (independent variable)



## 2. Purposive sampling:

The process whereby the researcher selects a sample based on experience or knowledge of the group to be sampled

...called “judgment” sampling



***disadvantages...***

...potential for inaccuracy in the researcher's criteria and resulting sample selections



### 3. Quota sampling

The process whereby a researcher gathers data from individuals possessing identified characteristics and quotas



## *disadvantages...*

...people who are less accessible (more difficult to contact, more reluctant to participate) are under-represented



# Sampling in Qualitative Research



## Sampling in Qualitative Research

Researchers in qualitative research select their participants according to their :

- 1) characteristics
- 2) knowledge



## The purposeful sampling

It is when the researcher chooses persons or sites which provide specific knowledge about the topic of the study.





## Types of Purposeful Sampling

- 1) Maximal Variation Sampling
- 2) Typical Sampling
- 3) Theory or Concept Sampling
- 4) Homogeneous Sampling
- 5) Critical Sampling
- 6) Opportunistic Sampling
- 7) Snowball Sampling



## *1- Maximal Variation Sampling*

It is when you select individuals that differ on a certain characteristic. In this strategy you should first identify the characteristic and then find individuals or sites which display that characteristic.



## *2- Typical Sampling*

It is when you study a person or a site that is “typical” to those unfamiliar with the situation. You can select a typical sample by collecting demographic data or survey data about all cases.



### ***3-Theory or Concept Sampling***

It is when you select individuals or sites because they can help you to generate a theory or specific concepts within the theory. In this strategy you need a full understanding of the concept or the theory expected to discover during the study.



## *4-Homogeneous Sampling*

- It is when you select certain sites or people because they possess similar characteristics.
- In this strategy, you need to identify the characteristics and find individuals or sites that possess it.



## ***5- Critical Sampling***

It is when you study an exceptional case represents the central phenomenon in dramatic terms.



## ***6- Opportunistic Sampling***

It is used after data collection begins, when you may find that you need to collect new information to answer your research questions.



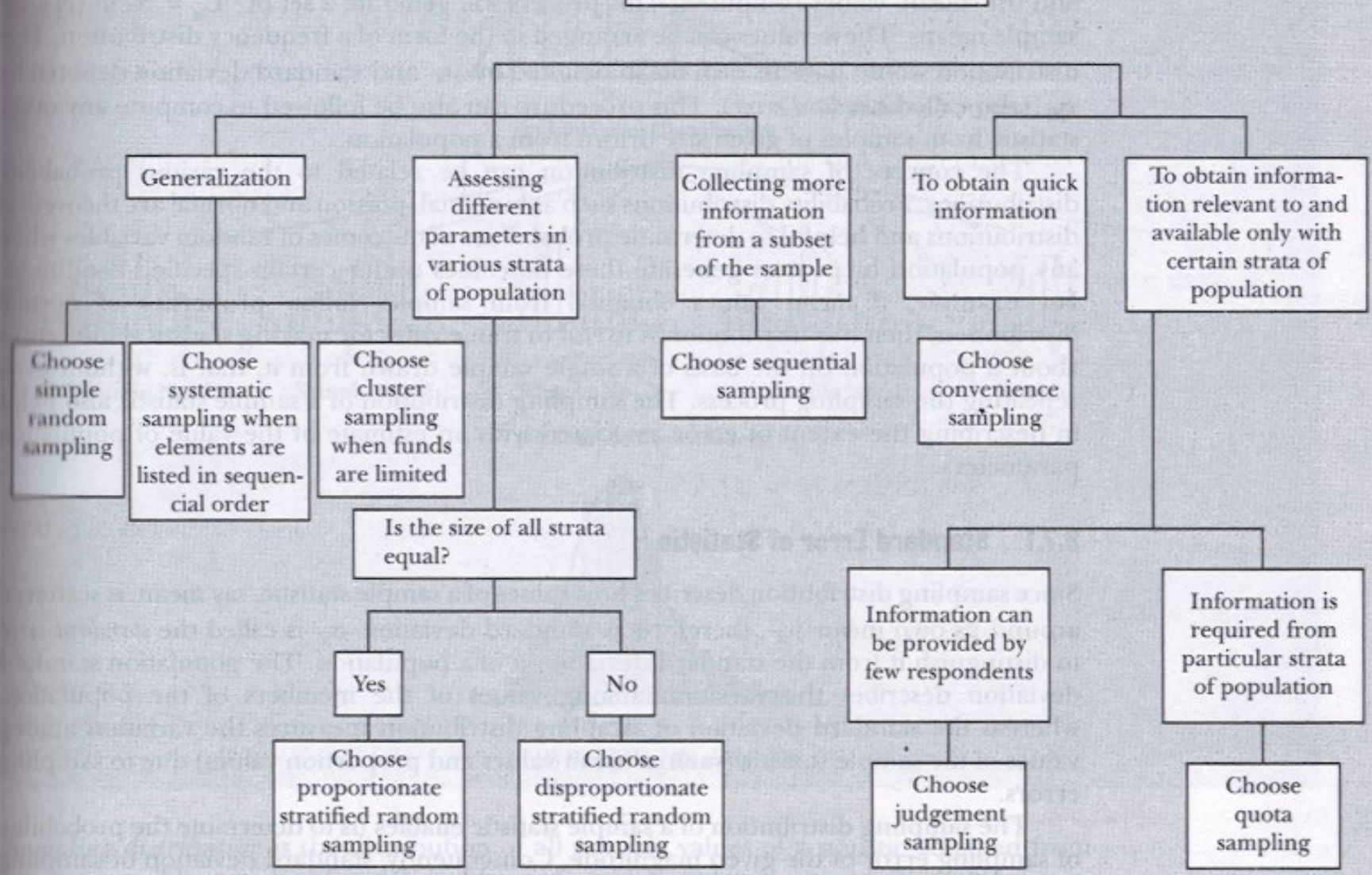
## *7-Snowball Sampling*

It is when you don't know the best people to study because of the unfamiliarity of the topic or the complexity of events. So you ask participants during interviews to suggest other individuals to be sampled.





What is the purpose of study?





## Ethical Considerations in Data Collection

- It is the researcher's ethical responsibility to safeguard the story teller by maintaining the understood purpose of the research...
- The relationship should be based on trust between the researcher and participants.
- Inform participants of the purpose of the study.



- Being respectful of the research site, reciprocity, using ethical interview practices, maintaining privacy, and cooperating with participants.
  
- Patton (2002) offered a checklist of general ethical issues to consider, such as:
  - ❖ reciprocity
  - ❖ assessment of risk
  - ❖ confidentiality,
  - ❖ informed consent
  - ❖ and data access and ownership.



- Qualitative researchers must be aware of the potential for their own emotional turmoil in processing this information
- During the interview process, participants may disclose sensitive and potentially distressing information in the course of the interview..

