

National university - Sudan

Faculty of Medical Laboratory Sciences

Batch 9 - Third year (sem. 6)

Introduction to Research – MLS – RESH -326

Sampling

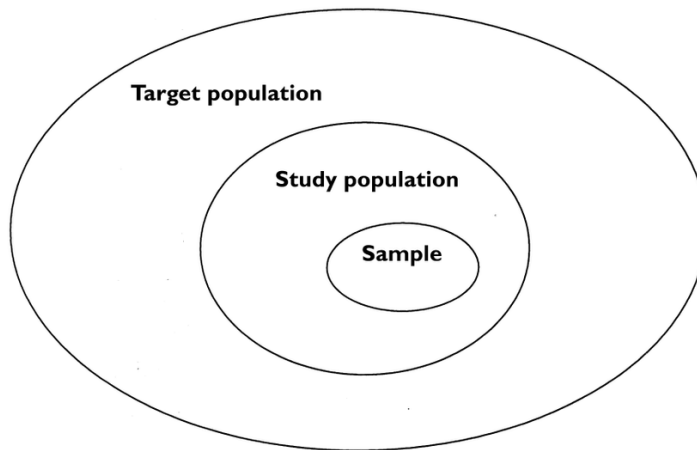
Lecture {11, 12}

Us.Tagwa Hafiz
0928500144

- **Sampling:**
- Is a statistical procedure that is concerned with the selection of the individual observation; it helps us to make statistical inferences about the population.
- **The population universe:**
- A group of people living in one geographical area.
- Samples are usually obtained from populations and thus it is logic that samples should be *representative* of the populations from which they are derived.

- **The population unit:**
- This is the individual person or thing or whatever being counted.
- Thus the population units could be health facilities, schools, ANC attendants, T.B. cases etc.
- **The sample frame:**
- This is the source from which the study subjects are selected.

- Examples of sampling frames:
 - • Hospital admission lists.
 - • Hospital outpatient lists.
 - • The list of the workers in a factory.
- **Representativeness:**
- A representative sample has all the important characteristics of the population from which it is drawn.



- **Sampling methods:**
- Sampling depends on the sampling frame.
- Types of sampling methods:
 1. Non probability sampling methods
 2. Probability sampling
- Probability sampling is the sampling technique in which every individual unit of the population has greater than zero probability of getting selected into a sample.
- Non-probability sampling is the sampling technique in which some elements of the population have no probability of getting selected into a sample.

- Types of non probability sampling:

- 1.Quota Sampling:

- Sample reflects population structure
 - Population divided into categories, a quota is to be selected from each category.
 - Is a method that ensures that a certain number of sample units from different categories with specific characteristics appear in the sample so that all these characteristics are represented.
 - Time/resources constraints .

- 2.Convenience sampling:

- Is a method in which for convenience sake the study units that happen to be available at the time of data collection are selected in the sample.
 - Samples not representative of the population.
 - Probability of being chosen is unknown
 - Samples do not involve any mathematical rules.

- 3.Purposive sample:
 - Researcher involves specific units in the sample Which it is believed to affect variables in a study.
- 4.Volunteer sample:
 - Some surveys involve tests (volunteers), therefore those included in the study are those who accept to take the test.

- **Types of Probability sampling:**
 - 1.Simple random sample:
 - This is the process in which every individual in the population is given an equal chance of being included in the sample.
 - Thus if a population is 5000 and a sample of 200 is to be drawn, then everyone of the 5000 has the same chance of being selected in the 200 sample subjects.

- Researchers typically use a computer program that randomly selects their samples. To use a computer program (sometimes called a random number generator) you must make sure that you give each of the people in your population a number, then the program gives you a list of randomly selected numbers.

- 2. Systematic sample:
 - This is defined as the process in which the selection is done systematically according to a list of the targeted population.
 - First, determine the sampling interval, which is symbolized by “k,” (it is the population size divided by the desired sample size).
 - Second, randomly select a number between 1 and k, and include that person in your sample.
 - Third, also include each k element in your sample.

- For example if k is 10 and your randomly selected number between 1 and 10 was 5, then you will select persons 5, 15, 25, 35, 45, etc.
- When you get to the end of your sampling frame you will have all the people to be included in your sample.

- 3. Stratified sample:
- In this type of sampling, the population is subdivided into strata.
- Thus for the sample to be representative, it should be drawn from each stratum separately.
- If the sample is drawn from the population without considering the stratification, then the whole sample may be drawn from one stratum rather than all strata.
- First, stratify your sampling frame.
- Second, take a random sample from each group.

- There are actually two different types of stratified sampling.
- The first, and most common is called proportional stratified sampling., in which you must make sure the subsamples (e.g., the samples of males and females) are proportional to their sizes in the population.
- The second type of stratified sampling is called disproportional stratified sampling.
- In disproportional stratified sampling, the subsamples are not proportional to their sizes in the population.

- 4. Cluster sample:
- In cluster sampling, we follow these steps:
- Divide population into clusters (usually along geographic boundaries) randomly sample clusters measure all units within sampled clusters
- In single-stage cluster sampling, all the elements from each of the selected clusters are used.
- In two-stage cluster sampling, a random sampling technique is applied to the elements from each of the selected clusters.

- *What is the difference between stratified sampling and cluster sampling?*
- The main difference between cluster sampling and stratified sampling is that in cluster sampling the cluster is treated as the sampling unit
- While in stratified sampling analysis is done on the elements within the strata.

- 5. Multi-stage sample :
- This is sample in which the parent population is divided into large units, from which a first stage sample is drawn randomly.
- Then a second stage sample is drawn from those sample units selected in the first stage.

A question to think about:

How to determine the sample
size?

Thank you