SAMPLING

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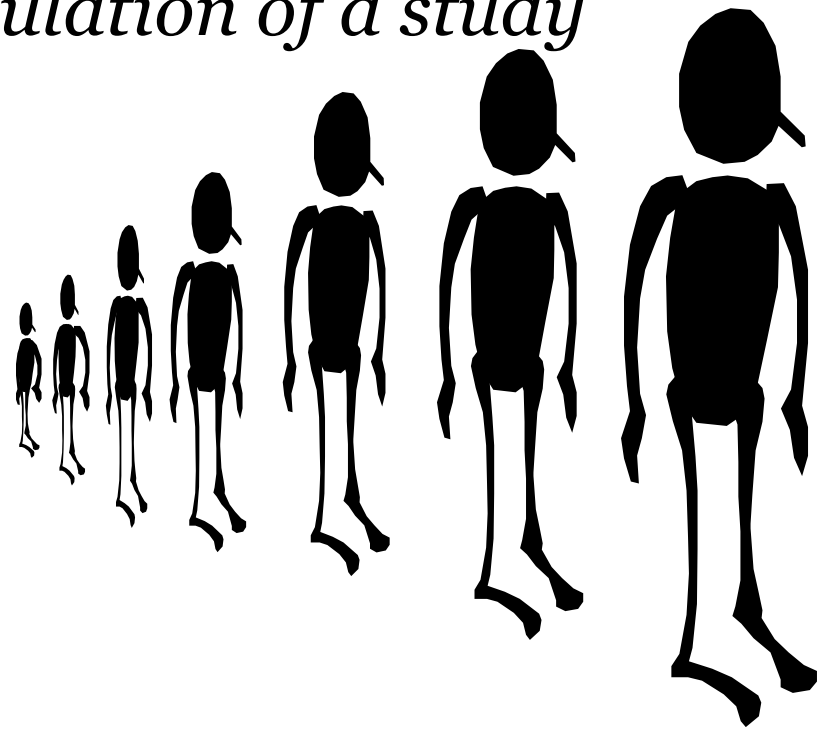
Sampling

"Sampling is process of selecting representative units from an entire population of a study"



Terminology

Population

- Aggregation of all units in which researcher is interested Or set of units to which findings can be generalized

Target Population

- Aggregate of all the cases with a certain phenomenon about which the researcher would like to make a generalization

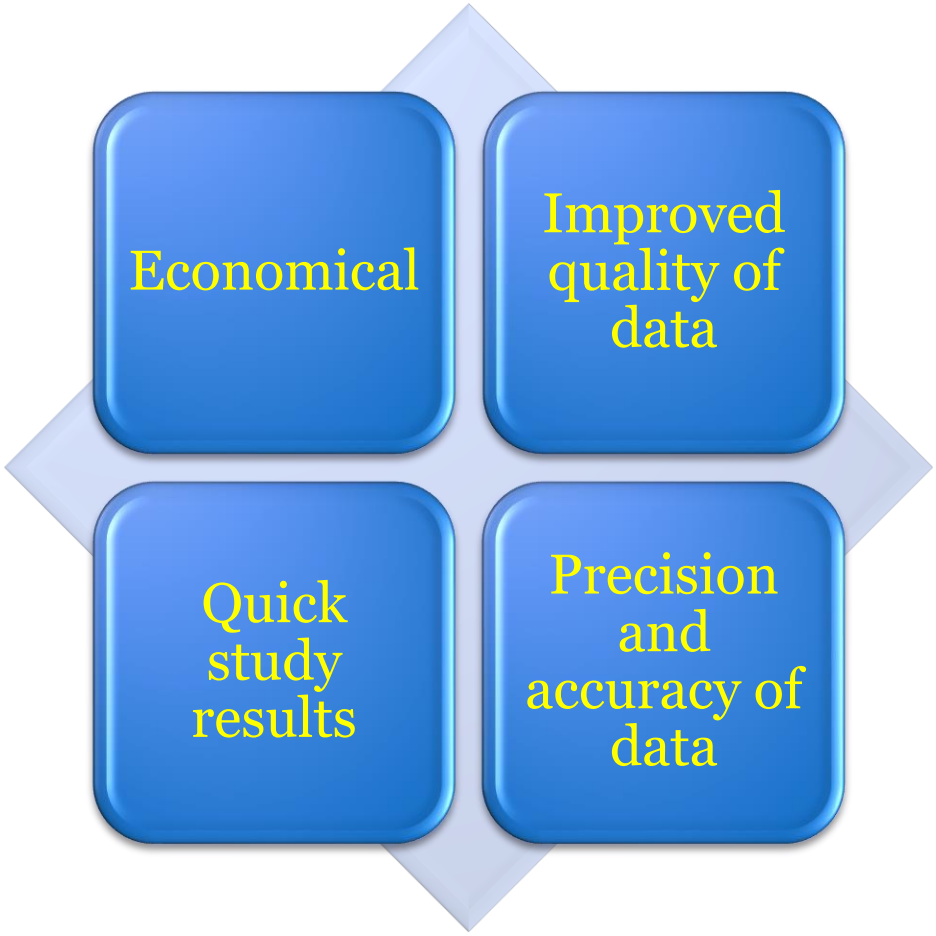
Accessible Population

- Aggregate of cases that conform to designated criteria and who are also available for research study

Terminology

Sample	• A subset of population
Sampling frame	• It is a list of all elements or subjects in the population from which the sample is drawn
Sampling error	• Difference between statistics and parameter
Sampling Plan	• The formal plan specifying sampling method, sample size and procedure for selecting subjects

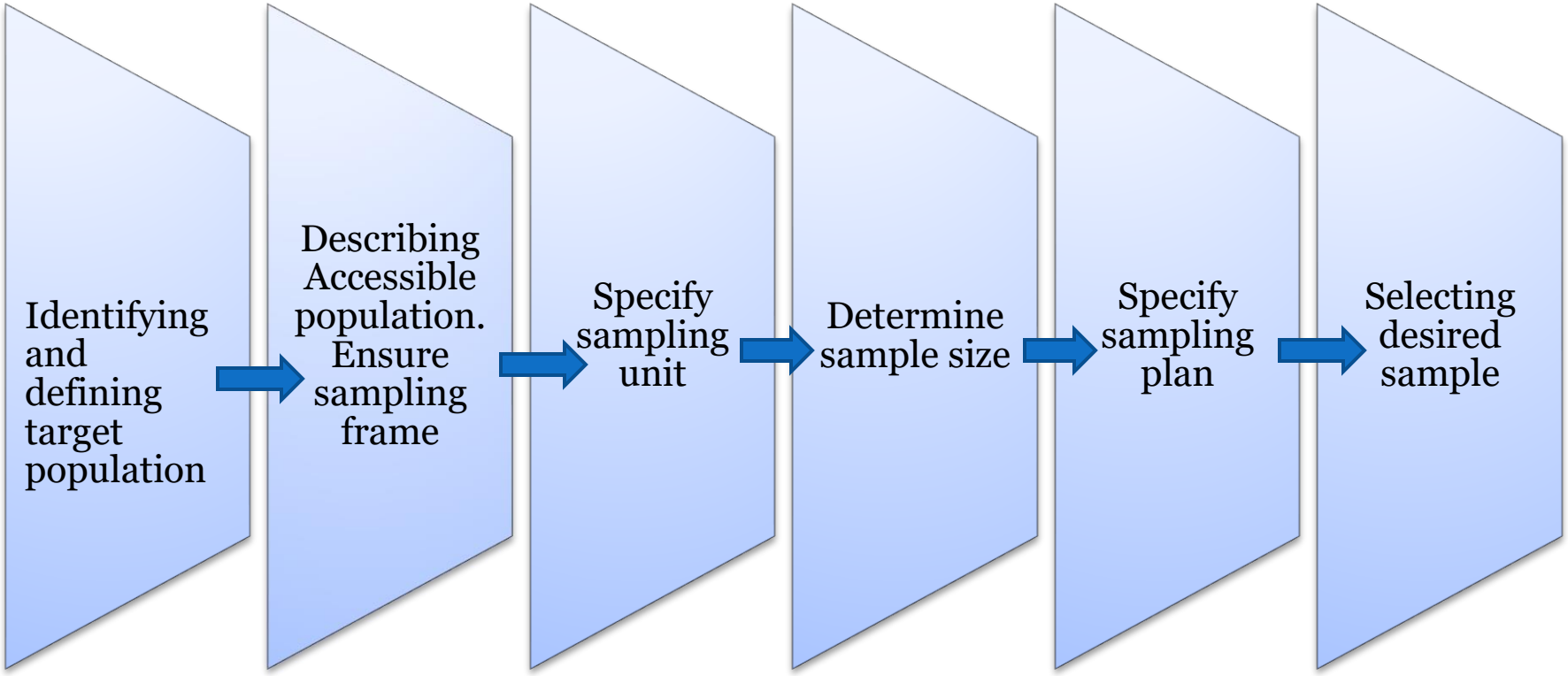
Why to do sampling?



Characteristics of good sample

- Representative
- Free from bias and errors
- No substitution or incompleteness
- Appropriate sample size

Sampling process



Types of sampling

Probability sampling-

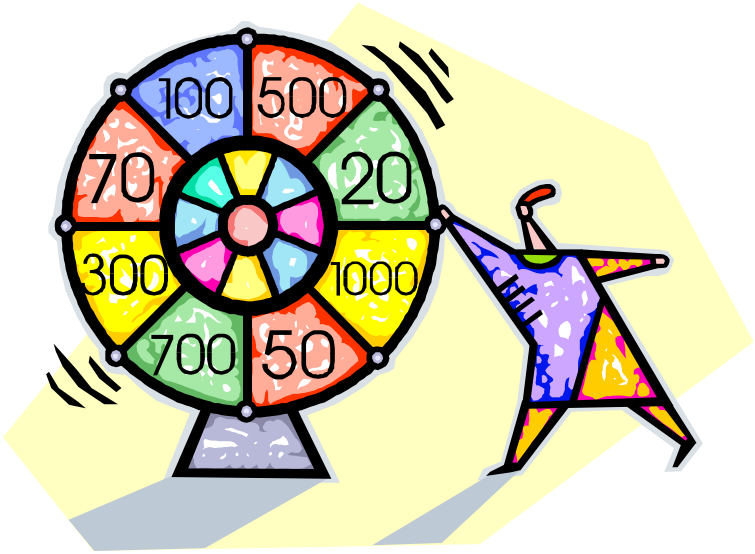
- Simple random sampling
- Stratified random sampling
- Systematic sampling
- Cluster sampling
- Sequential sampling

Non probability sampling-

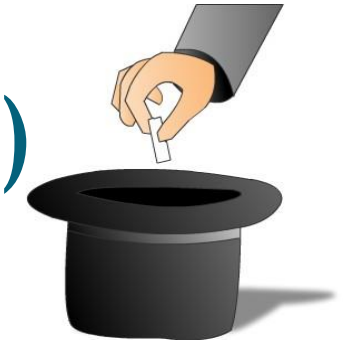
- Purposive sampling
- Convenient sampling
- Consecutive sampling
- Quota sampling
- Snowball sampling

Probability Sampling

"Samples are gathered in a process that gives all the individuals in the population equal chance of being selected"



Simple Random Sampling(SRS)



- ✓ Every member of population has an equal chance of being selected
- ✓ Pre-requisites: *Homogeneity, Sampling frame, Random selection by random number tables or lottery*
- ✓ Advantages: *reliable, unbiased*
- ✓ Disadvantage: *Time consuming, needs complete sampling frame*

Stratified random sampling

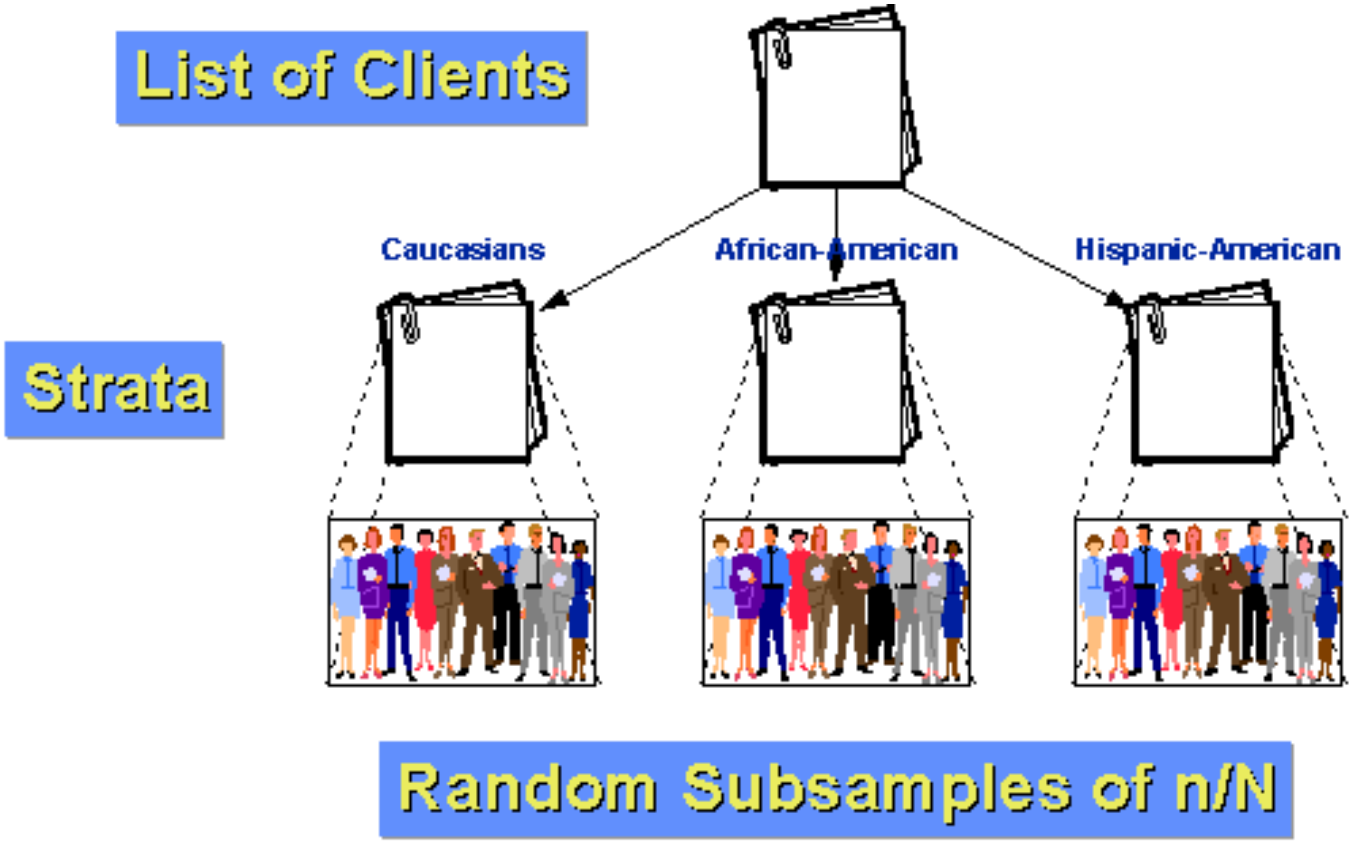
- Dividing heterogeneous population into strata based on selected trait such as gender, religion etc and then random selection from each strata
- Advantages:

  1. Representative sample from heterogeneous data ensured

  2. Comparison is possible in two groups
- Disadvantages:

  Faulty classification of strata, large population required, need for sampling frame

Stratified Random Sampling

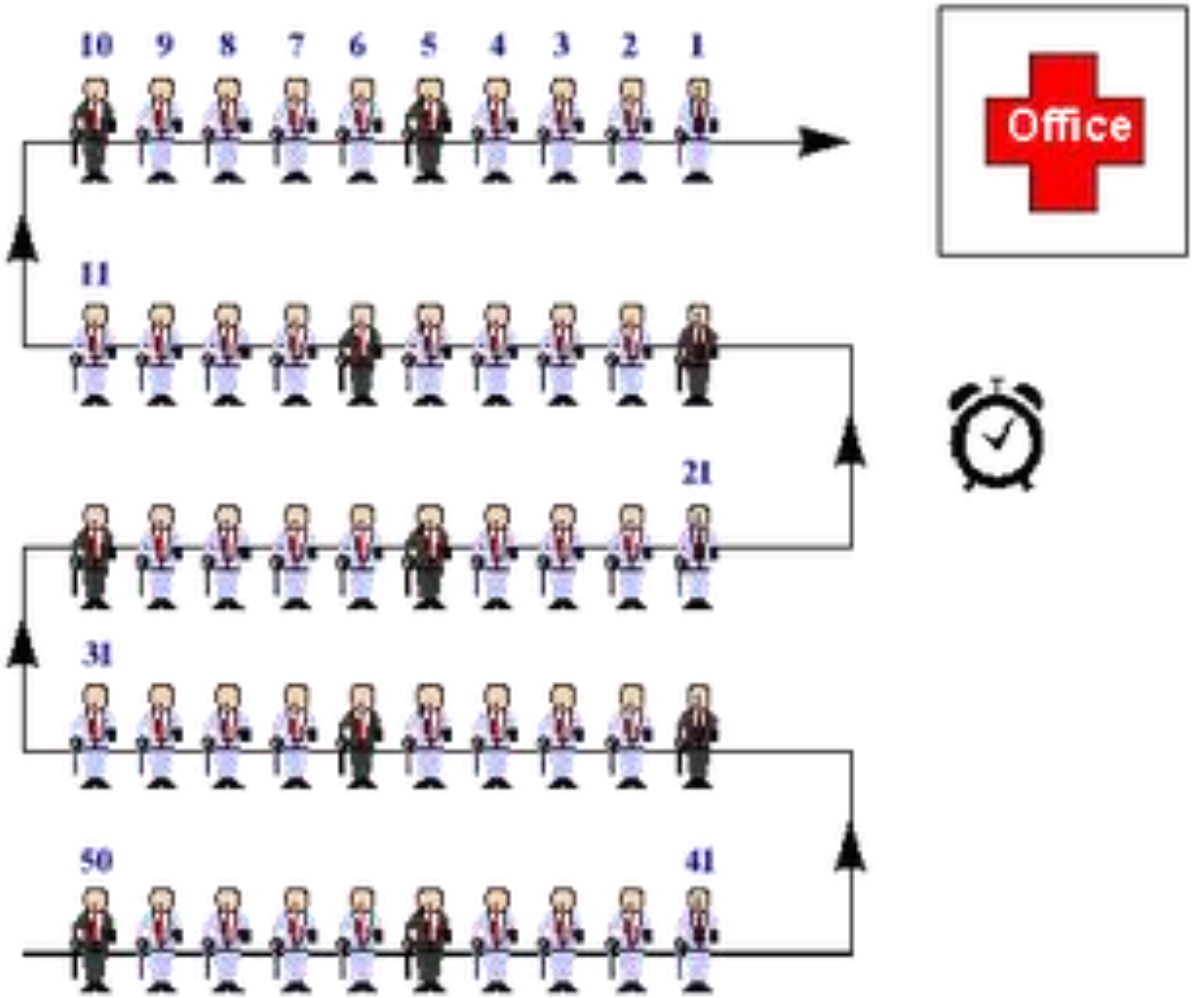


Systematic Random Sampling

- Selecting every Kth case from the group

  eg.every 10th person
- First case is chosen by using random table
- Advantages: *simple, convenient, distribution of sample over entire population*
- Disadvantages: *Less representative sample if subjects are non randomly distributed*

Systematic Random Sampling



Cluster or Multistage Sampling

- In very large population, random selection of geographic clusters and then random selection of samples from these clusters
- Advantages: *Cheap, quick and easy for large population*
- Disadvantages: *Possibility of high sampling error, improper clustering may lead to over representation or under represented data*

Sequential Sampling

Investigator initially selects small samples and tries to make inferences; if not able to draw results new subjects are added until clear cut inferences can be drawn

Advantage: Study on best possible smallest sample

Disadvantage: Repeated entry into setting to collect data.

Not possible to study a phenomenon which needs to be studied at one point of time

Non Probability Sampling

- Does not ensure all the cases in the population equal chance of being selected in the sample

- Types:
  1. *Purposive sampling*
  2. *Convenience sampling*
  3. *Consecutive sampling*
  4. *Quota sampling*
  5. *Snowball sampling*

Purposive Sampling

Subjects are chosen to be part of the sample with a specific purpose in mind

Also known as judgmental sampling

Used when limited number of subjects possess the trait which is under study

eg: Depression among Tsunami victims

Advantages: *Simple to draw sample, saves resources*

Disadvantages: *Needs in depth knowledge about population, Bias may occur*

Convenience sampling

Subjects are selected because of their convenient accessibility and proximity to the researcher

Advantages: Easiest, cheapest and less time consuming. Can save money, time and resources

Disadvantages: Sampling bias, findings cannot be generalized

Consecutive sampling

Picks up all the available subjects who are meeting preset inclusion criteria

Used for continuously changing population such as hospital patients *eg. Patient satisfaction survey*

Advantages: *Ensures more representative sample, less time consuming*

Disadvantages: *Sample size large*

Quota sampling

Equal or proportionate representation of subjects from each quota like age, gender, religion.

Advantages: *Economically cheap, Useful for field studies*

Disadvantages: *Chance of sampling bias, does not guarantee representative sample*

Snowball Sampling

Locating the initial subject, and then taking assistance from the subject to identify people with a similar trait of interest. eg. Down's syndrome in a community area

Advantages: *Sampling for subjects hard to locate. Needs less workforce, cost efficient*

Disadvantages: *Little control for researcher over sampling method, sample size etc. chances of poor coverage of entire population*

Sample Size

- Qualitative study- data saturation
- Quantitative studies- Power analysis(statistical Application)
- Other statistical formula

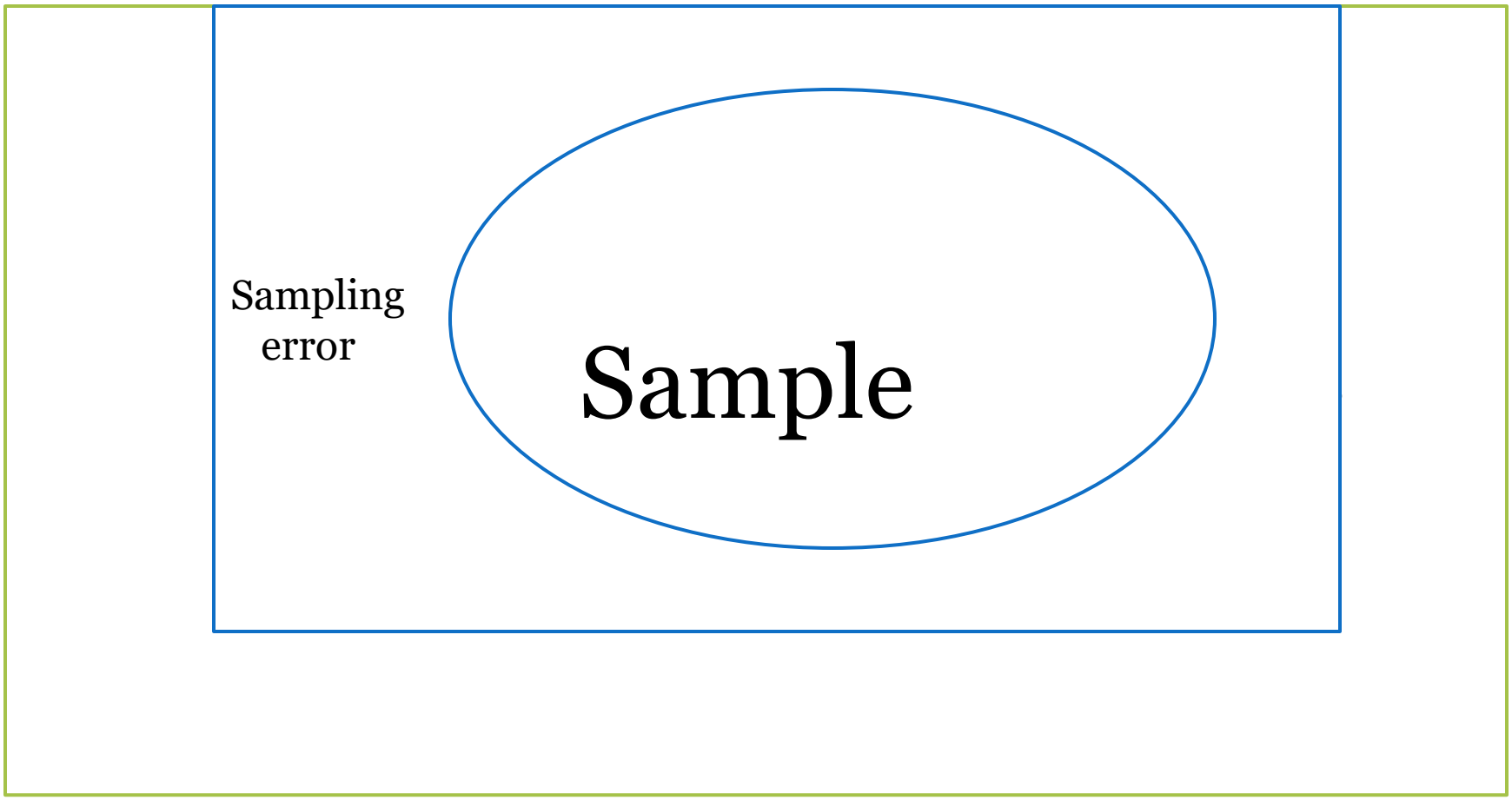
Factors Affecting Sample size

- ✓Resources available
- ✓Nature of study
- ✓Sampling methods used
- ✓Homogeneity
- ✓Effect size
- ✓Cooperation and attrition
- ✓Subgroup analysis

Sampling error

- Deviation of selected sample from the true characteristics of population
- Sampling error is inversely proportional to sample size


Sample
Sampling error


Sampling error
Sample

Problems of sampling

- Sampling error
- Lack of sample representativeness
- Difficulty in estimation of sample size
- Lack of knowledge about the sampling process
- Lack of resources
- Lack of cooperation
- Lack of existing appropriate sampling frame
- Callous approach of the researcher towards sampling process

Conclusion

Sampling is a diligent process that ensures generalization of findings to the selected population

THANK YOU