

Sampling

Sampling strategies critical to good statistics!
Key point

Randomness.

want to minimize "bias" in the sample.

Sampling frame \rightarrow a listing of individuals/objects
in the population to be sampled.

might not always be available.

Simple Random Samples (SRS)

- (i) Every object in sampling frame has equal chance of being in a sample
- (ii) Every subset of size n has equal chance of being the chosen sample of size n .

Advantages

Stratified Sampling

- (i) Divide population into strata.
- (ii) Apply SRS to each strata.

Sampling Techniques

The strata

homogeneous w.r.t to a given variable.

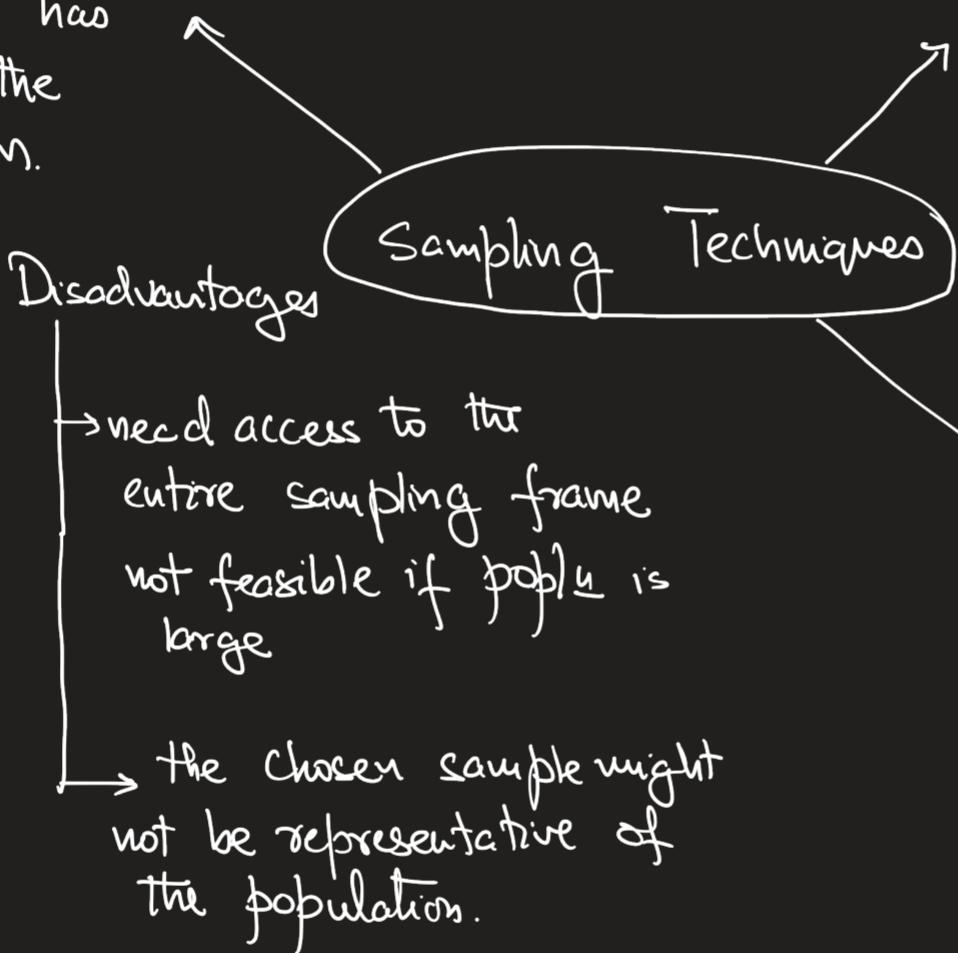
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 might not always be available.

Simple Random Samples (SRS)

- (i) Every object in sampling frame has equal chance of being in a sample
- (ii) Every subset of size n has equal chance of being the chosen sample of size n .

Advantages

- simple
- unbiased
- need minimum advance information about population
- works well when experiment involves repeated sampling and cost of sampling is low.



Stratified Sampling

- (i) Divide population into strata.
- (ii) Apply SRS to each strata.

The strata

- homogeneous wrt to a given property
- mutually exclusive and exhaustive.

Cluster Sampling

- (i) Divide population into clusters.
- (ii) Apply SRS to choose a subset of clusters.

Main Advantage:

- Cost effective → travelling costs
- research and listing costs.

Note: Each cluster must be representative of the population. Improved precision.

Stratified vs Cluster Sampling

Stratified

Cluster

Main Advantage

- Sample representative of population

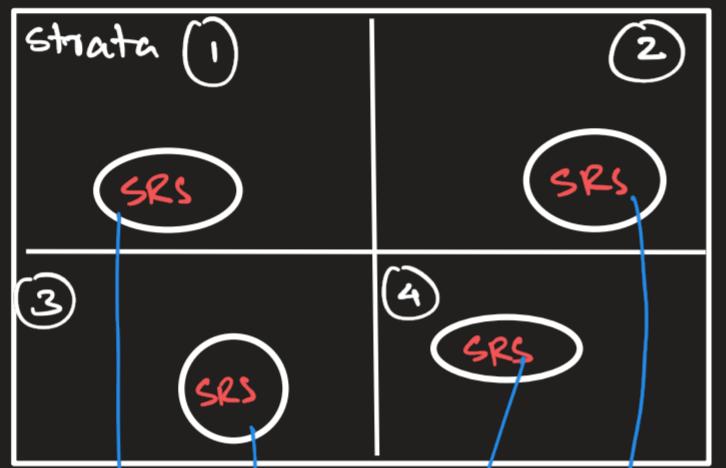
Cost effective \rightarrow travelling costs

- research and listing costs.

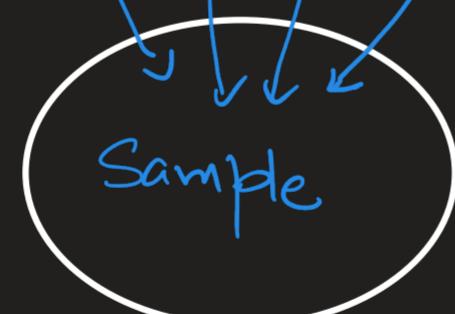
Note: Each cluster must be representative/improved precision of the population.

Stratified vs Cluster Sampling

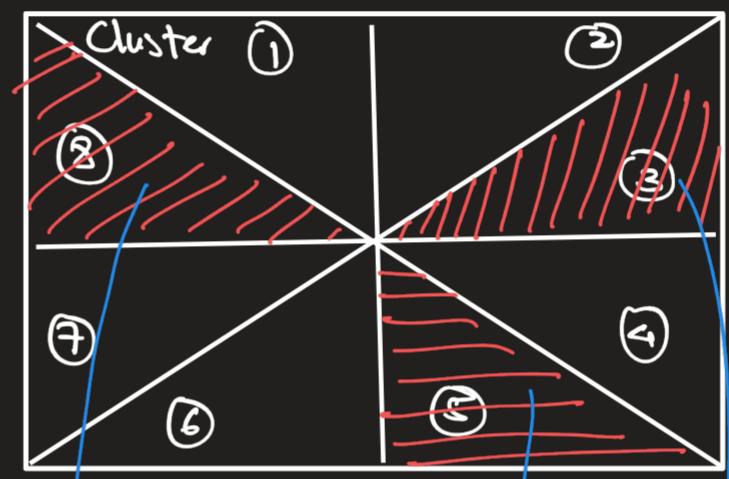
Stratified



We do SRS in each of the four strata.



Cluster.



We do SRS on the set
 $\{1, 2, 3, 4, 5, 6, 7, 8\}$

Suppose clusters 3, 5, 8 are selected.

