

Sampling

Today we are learning...

What sampling is and when it may be used.

I will know if I have been successful if...

I understand the difference between a sample and a population.

I can give an example of when sampling would occur.

I can consider methods to select a sample.



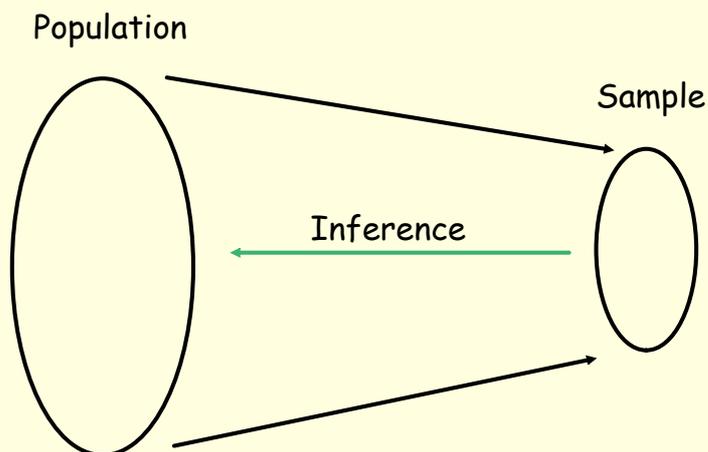
Page 75

Politics Example

Key Terms and Definitions

Statistical Inference - Statistical inference is the study of how to use information from a sample to draw valid conclusions about the population.

Study of the sample may produce a **sample statistic**, such as the mean, \bar{x} , which is used to infer the value of the population parameter, in this case the population mean, μ .



Statistical Inference

Sample Statistics

Size = n
Mean = \bar{x}
Variance = s^2

Corresponding Population Parameter

Size = N
Mean = μ
Variance = σ^2

The formula for s^2 is given in the formula booklet.

Other Definitions

Population: The whole collection of individuals that we aim to study and draw conclusions about.

Sample: A subset of the population from which we intend to collect data to draw conclusions about the population.

Sampling Units: Non-overlapping collections of individuals from the population. For example; post code districts or schools.

Sampling frame: An exhaustive list of all the units in the population.

Sampling fraction: The proportion of the population to be sampled. If a sample of size n , from a population of size N then the sampling fraction is $\frac{n}{N}$

Example in Context

Study Question -	What is the average height of students at Firrhill?
Parameter -	Mean Height
Population -	All pupils at Firrhill
Sample -	Possibly one student from each year?
Sampling Units -	Individual Pupils
Sampling Frame -	The full register of all pupils

Simple Random Sampling

Probability Sampling - General name given to a variety of methods where, to avoid a selection bias, a random process is used to choose the units to include in the sample. The probability of any unit being sampled is known beforehand. Although this need not be the same for each unit.

Simple Random Sampling - This is the most basic form of probability sampling. Units are selected for the sample by numbering all the units in the sampling frame consecutively from 1 to N, then choosing n of them randomly. Each unit in the population has the same chance of being sampled. The random selection can be achieved in a number of ways shown on Page 78.

Ex 3.2 - Circles

Stratified Random Sampling

Today we are learning...

How to conduct a stratified random sample.

I will know if I have been successful if...

I understand the term strata.

I can conduct a stratified random sample.

I understand why a stratified random sample may be better.



Page 94

Key Term

Strata - Non-overlapping groups of strata, where the units in each stratum are thought to have similar characteristics.

EX 3.7

Cluster Sampling

Today we are learning...

What cluster sampling is and how we conduct it.

I will know if I have been successful if...

I understand how to carry out a cluster sample.

I know what a two stage cluster sample is.

I know what a multi stage cluster sample is.



Cluster Sampling

Cluster Sampling -

With cluster sampling, the researcher divides the population into separate groups, called clusters. Then, a simple random sample of clusters is selected from the population.

This helps keep costs down.

Strata vs Cluster

Clusters are considered to be similar to each other because each cluster should reflect the characteristics of the population.

Strata are groups that contain similar traits. Strata vary significantly between each other.

Multi Stage Cluster Sampling

Two-Stage Cluster Sampling

For example, a researcher wants to survey academic performance of high school students in Spain. He can divide the entire population (population of Spain) into different clusters (cities). Then the researcher selects a number of clusters depending on his research through simple or systematic random sampling.

Multi Stage Cluster Sampling

Occasionally, it is possible to identify subgroups within clusters which may be randomly sampled and this can lead to a multi stage design.

EX 3.8

Further Sampling Methods

Convenience Sampling -

Quota Sampling -

Systematic Sampling -

EX 3.9