Sampling Techniques

Types of sampling technique

Random

- Systematic Sampling
- Simple Random Sampling
- Stratified Sampling

Non-random

- Quota Sampling
- Opportunity Sampling

Definitions & Examples

Systematic Sampling Systematic sampling is where you start at a random position in a list, and then take every n^{th} term and create a sample of the population this way.

For example:

The full population is 20 people, the following list shows them:

$[1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20]$

Pick a random number to start on:

3

Select every 5th number after this:$[3, 8, 13, 18]$

Note: The sampling frame is usually randomised to decrease bias (grouping people alphabetically could cause issues where certain members of the population are over or under-represented)

Simple Random Sampling Given a list of numbers, you just randomly select a sample of them. I.E., generate 10 random numbers on a calculator, and then pick these people.

Stratified Sampling Stratified Sampling is where you take the population and split them into different groups. You then take these groups and proportionally sample based off their numbers.
For example:

The full population is 100 people. There are 60 women, and 40 men.

$\therefore$ 60% women and 40% men

You are then told that you must do a sample of 50 of these people

$\therefore 60\% \times 50 = 30, 40\% \times 50 = 20$

You then take a simple random sample from these numbers

Quota Sampling Quota Sampling is where the population is divided into groups of characteristics (specifically selected by the researcher). For example, before a researcher starts, they may decide that they want to interview 30% women and 70% men. The researcher then interviews people and assesses their group, this continues until each quota has been filled. If someone refuses to be interviewed, one can just move on!

Opportunity Sampling A good example of this is when someone waits outside a shop and picks a random person to interview whenever someone steps outside the door, it doesn't matter if the person refuses to be interviewed, because you can just wait for the next person!

Advantages & Disadvantages

Systematic Sampling

Advantages	Disadvantages
Simple and quick to use	A sampling frame is required
Suitable for large samples and large populations	It can introduce bias if the sampling frame is not random

Simple Random Sampling

Advantages	Disadvantages
Free of bias	Not suitable when the population or sample size is too large
Easy and cheap to implement for small populations and small samples	A sampling frame is required
Each sampling unit has a known and equal chance of selection	

Stratified Sampling

Advantages	Disadvantages
Sample accurately emulates the population structure	The random selection within each strata suffers from the same issues as Simple Random Sampling
Guarantees proportional representation of groups within a population	Population must be clearly classified into distinct groups

Quota Sampling

Advantages	Disadvantages
Small samples can still be representative of a whole population	Non-random sampling can introduce bias
Simple, quick & cheap	Groups might be inaccurate
Allows a researcher to make comparisons between the groups of a population	Increasing the scope of a study drastically increases the cost of the study
No sampling frame	Non-responses give no meaningful data

Opportunity Sampling

Advantages	Disadvantages
Easy to carry out	Dependent on the individual researcher
Cheap	Most likely won't be representative