

Simple random sampling

Abstract

Simple Random Sampling is a probability sampling method in which every member of a population has an equal chance of being selected. It ensures fairness, reduces selection bias, and provides a representative sample when a complete population list is available. Although simple and statistically reliable, it may be less practical for large or widely dispersed populations. Overall, Simple Random Sampling remains a fundamental and widely used technique in research and surveys.

Key words

Simple random sampling, random selection, sample, population, probability sampling

Introduction

A simple random sample is a randomly selected subset of a population. (Cochran, 1977). Simple random sampling is one of the most basic and widely used sampling techniques in statistics. The process typically involves defining the entire population, assigning each member as a unique identifier, and then selecting individuals randomly or manually (such as drawing names from a hat) or using random number generators. (Lohr, 2021). This approach helps reduce bias and ensures that the sample represents the population as accurately as possible. Simple random sampling is especially useful when the population is fairly homogeneous and when a complete list of the population is available. It provides results that can easily be analysed using standard statistical methods, making it an essential tool for surveys, experiments, and research in various fields. (Kish, 1965).

When to use simple random sampling

However, simple random sampling can be challenging to implement in practice.

To use this method, there are some prerequisites

You have a complete list of every member of the population. (Cochran, 1977).

You can contact or access each member of the population if they are selected.

You have the time and resources to collect data from the necessary sample size.

How to Perform Simple Random Sampling

Define the population: Clearly identify the entire group you want to study.

Assign numbers: Give a unique number to every individual in the population.

Determine sample size: Decide how many individuals you need for your sample.

Use a random method: Select numbers randomly. Common methods include:

Random Number Generator: Use a tool or software to generate random numbers.

Lottery Method: Write each member's number on a slip of paper, put them in a container, mix them, and draw the required number of slips.

Collect data: Gather information from the individuals whose numbers were selected.

The given Table 1 shows types of sampling

Table 1

Simple Random Sampling Techniques

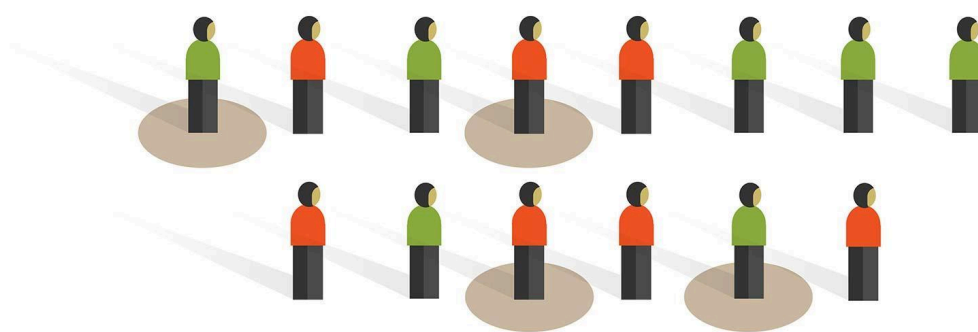
Technique	Description	When Used
Lottery Method	Draw slips randomly.	Small groups; manual selection
Random Number Table	Pick numbers from a Random table	When no computer is available
Computer Random Generator	Software generates random numbers.	Large samples; quick selection
Online Randomizer	Website/app generates Random picks	Easy access; fast sampling
Mechanical Draw	Physical device mixes and selects	lotteries; public draws

From the Table 1 techniques of Simple Random Sampling can be easily observed.

The given Figure 1 shows population and sample

Figure 1

Population and selection



From the Figure 1 shows a large group of individuals where a few are randomly highlighted, representing how simple random sampling selects people purely by chance, giving everyone an equal chance of being chosen.

Advantages

Simple random sampling has several advantages: it gives every member of the population an equal chance of being selected, making the method fair and unbiased. It is easy to understand and apply, especially for smaller populations, and it generally produces a highly representative sample when the sample size is adequate. (Lohr, 2021). It also helps reduce selection bias because the process relies entirely on random choice. (Thompson, 2012).

Disadvantages

Simple random sampling has some disadvantages: it requires a complete and accurate list of the entire population, which may not always be available. (Cochran, 1977). It can also be time-consuming and costly when dealing with large or widely dispersed populations. Additionally, because the selection is purely random, important subgroups may be missed by chance, making the sample less representative in some cases.

Conclusion

Simple Random Sampling is a fundamental probability sampling method that ensures every member of the population has an equal chance of selection. It reduces selection bias, provides high representativeness when the population is homogeneous, (Kish, 1965). and forms the basis for many statistical techniques. Although it may require a complete population list and can be time-consuming for large groups, it remains one of the most reliable and easy-to-understand sampling methods for producing unbiased and valid results.

References

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