

Multistage Sampling

Sampling methods are techniques used to select a representative portion of a population for research, helping save time, cost, and effort. Among the various methods, multistage sampling is commonly used when the population is large and spread across wide areas.

Abstract

Multistage sampling is a probability sampling method used when the population is large and scattered. It involves selecting samples in two or more stages, where each stage applies random selection to narrow down the sample. This method is cost-effective, flexible, and suitable for large-scale surveys. However, it may lead to increased sampling errors and complex data analysis. Despite these challenges, multistage sampling remains an efficient approach for collecting representative data from large populations.

Keywords

Multistage Sampling; Probability Sampling; Cluster Sampling; Research Method; Data Collection

Introduction

Multistage sampling is a probability sampling method used when the population is large and spread over a wide area. It involves selecting samples in two or more stages using random selection at each stage. This method is practical, time-saving, and cost-effective, especially in large-scale studies such as education or health surveys. Although it may increase sampling errors, multistage sampling helps researchers collect accurate and representative data efficiently.

Multistage Sampling Method

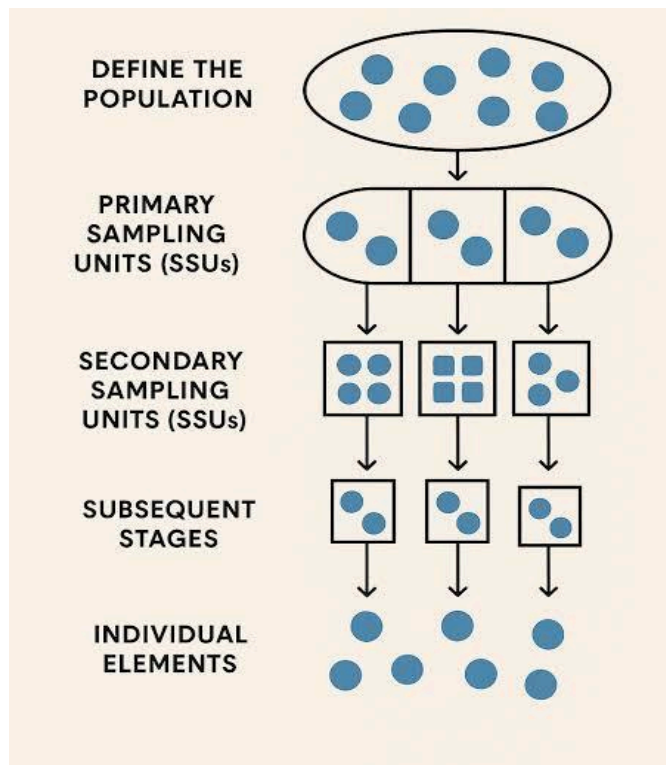
Multistage sampling is a probability sampling technique used when it is impractical or costly to survey an entire population. It involves selecting samples in two or more stages, where each stage uses a random sampling method to reduce the population further (Creswell,2014). In this method, the researcher first divides the population into large groups, known as primary sampling units (PSUs). From these, a random selection is made. The selected groups are then further divided into smaller units, called secondary sampling units (SSUs), and the process continues until the final sample units are chosen (Kothari,2013).

This approach is particularly useful when the population is large, widely dispersed, or lacks a complete list of members. For example, in a national educational survey, a researcher may first select a few states, then districts within those states, schools within the districts, and finally students within the schools. Thus, data are collected only from the selected students, saving time and resources (Singh & Masuku,2014). The stages and corresponding process are illustrated in table 1.

Table 1*Stages of multistage sampling*

Stages	Process
Stage 1	Select primary sampling units (example- States, regions)
Stage 2	Select secondary units from the chosen primary units (example- Districts)
Stage 3	Select tertiary units (example- Schools or households)
Stage 4	Select the ultimate sampling units (example- Students, individuals)

The Table 1 neatly outlines the sequential steps involved in multistage sampling making the process easy to understand and follow. Each step - from identifying the population to selecting primary, secondary, and final sampling units - is clearly defined. The pictorial representation of Multistage sampling is given in Figure 1.

Figure 1*Multistage Sampling*

The Figure 1 shows how multistage sampling works by selecting groups in steps starting from the whole population, then choosing primary and secondary units and finally selecting individual elements.

Advantages

1. Cost and time efficient – no need to survey the entire population.
2. Practical for large areas – useful for geographically spread populations.
3. Flexible – researchers can choose how many stages to include.
4. Combines different sampling methods – example Random sampling and stratified sampling (Lohr 2010).

Disadvantages

1. Increased sampling error – errors may compound at each stage.
2. Complex design and analysis – harder to calculate accurate estimates.
3. Requires detailed population information at each stage.
4. Possible bias if random selection is not maintained properly (Kumar,2019).

Conclusion

Multistage sampling is an effective and flexible method for studying large and diverse populations. By selecting samples in stages, it reduces time, cost, and effort while maintaining representativeness. Though it may involve some sampling errors and complexity, it remains one of the most practical approaches for large-scale research in fields such as education, health, and social sciences.

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