LECTURE 10 SAMPLING

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INTRODUCTION: MEANING OF SAMPLING

Data collection stage of any research requires considerable time, effort, and money. If primary data are collected using census method, time and cost increases considerably. Sampling techniques help us in this situation. A true representative sample not only gives accurate results but also saves on time, effort, and money. This chapter is devoted to sampling methods and techniques.

The terminology "sampling" indicates the selection of a part of a group or an aggregate with a view to obtaining information about the whole. This aggregate or the totality of all members is known as Population although they need not be human beings. The selected part, which is used to ascertain the characteristics of the population, is called Sample. While choosing a sample, the population is assumed to be composed of individual units or members, some of which are included in the sample. The total number of members of the population is called Population Size and the number included in the sample is called Sample Size.

Researchers usually cannot make direct observations of every individual in the population they are studying. Instead, they collect data from a subset of individuals – a *sample* – and use those observations to make inferences about the entire population.

Ideally, the sample corresponds to the larger population on the characteristic(s) of interest. In that case, the researcher's conclusions from the sample are probably applicable to the entire population.

This type of correspondence between the sample and the larger population is most important when a researcher wants to know what proportion of the population has a certain characteristic –like a particular opinion or a demographic feature. Public opinion polls that try to describe the percentage of the population that plans to vote for a particular candidate, for example, require a sample that is highly representative of the population.

NEED OF SAMPLING

To draw conclusions about populations from samples, we must use inferential statistics which enables us to determine a population`s characteristics by directly observing only a portion (or sample) of the population. We obtain a sample rather than a complete enumeration (a census) of the population for many reasons. Obviously, it is cheaper to observe a part rather than the whole, but we should prepare ourselves to cope with the dangers of using samples. In this tutorial, we will investigate various kinds of sampling procedures. Some are better than others but all may yield samples that are inaccurate and unreliable. We will learn how to minimize these dangers, but some potential error is the price we must pay for the convenience and savings the samples provide.

ESSENTIALS OF SAMPLING:

In order to reach a clear conclusion, the sampling should possess the following essentials:

1. It must be representative: The sample selected should possess the similar characteristics of the original universe from which it has been drawn.

2. Homogeneity: Selected samples from the universe should have similar nature and should not have any difference when compared with the universe.

3. Adequate samples: In order to have a more reliable and representative result, a good number of items are to be included in the sample.

4. Optimization: All efforts should be made to get maximum results both in terms of cost as well as efficiency. If the size of the sample is larger, there is better efficiency and at the same time the cost is more. A proper size of sample is maintained in order to have optimized results in terms of cost and efficiency.

ADVANTAGES OF SAMPLING

The sampling only chooses a part of the units from the population for the same study. The sampling has a number of advantages as compared to complete enumeration due to a variety of reasons. Sampling has the following advantages:

1. **Cost effective:** This method is cheaper than the Census Research because only a fraction of the population is studied in this method.

2. **Time saving:** There is saving in time not only in conducting the sampling enquiry but also in the decision making process
3. **Testing of Accuracy:** Testing of accuracy of samples drawn can be made by comparing two or more samples.
4. **Detailed Research is Possible:** Since the data collected under this method is limited but homogeneous, so more time could be spend on decision making.
5. **Reliability:** If samples are taken in proper size and on proper grounds the results of sampling will be almost the same which might have been obtained by Census method.
6. **Exclusive methods in many circumstances**: Where the population is infinite, then the sampling method is the only method of effective research. Also, if the population is perishable or testing units are destructive, then we have to complete our research only through sampling. Example: Estimation of expiry dates of medicines.
7. **Administrative convenience:** The organization and administration of sample survey are easy for the reasons which have been discussed earlier.
8. **More scientific:** Since the methods used to collect data are based on scientific theory and results obtained can be tested, sampling is a more scientific method of collecting data.

LIMITATIONS OF SAMPLING

It is not that sampling is free from demerits or shortcomings. There are certain limitations of this method which are discussed below:

1. **Biased Conclusion**: If the sample has not been properly taken then the data collected and the decision on such data will lead to wrong conclusion. Samples are like medicines. They can be harmful when they are taken carelessly or without knowledge off their effects.
2. **Experienced Researcher is required**: An efficient sampling requires the services of qualified, skilled and experienced personnel. In the absence of these the results of their search will be biased.
3. **Not suited for Heterogeneous Population**: If the populations are mixed or varied, then this method is not suited for research.
4. **Small Population**: Sampling method is not possible when population size is too small.

5. **Illusory conclusion:** If a sample enquiry is not carefully planned and executed, the conclusions may be inaccurate and misleading.
6. **Sample Not Representative:** To make the sample representative is a difficult task. If a representative sample is taken from the universe, the result is applicable to the whole population. If the sample is not representative of the universe the result may be false and misleading.
7. **Lack of Experts:** As there are lack of experts to plan and conduct a sample survey, its execution and analysis, and its results would be unsatisfactory and not trustworthy.
8. **Conditions of Complete Coverage:** If the information is required for each and every item of the universe, then a complete enumeration survey is better.