SAMPLE AND SAMPLING

A sample is selected subset of individuals among total population.

Sampling:

Sampling is process of selecting the group that you will actually collect data from entire population in your research. Or

Sampling is process of choosing a representative portion of the entire population

For example, if you are researching the opinions of students in university, you could survey a sample of 100 students in spite of entire population.

SAMPLING UNIT

The list of all the sampling units with a proper identification (which represents the population to be covered is called sampling frame).

SAMPLE AND POPULATION

A population includes all elements from a set of data whereas sample consists one or more observations drawn from the population.

Example:

The population may be "ALL people living in the US.“

A sample data set contains a part, or a subset of a population. The size of a sample is always less than the size of the population from which it is taken.

A population is the entire group that you want to draw conclusions about. A sample is the specific group that you will collect data from. The size of sample is always less than the total size of population.

What is sampling?

Sampling is a technique of selecting individual members or a subset of the population to make statistical inferences from them and estimate characteristics of whole population.

It is time convenient and a cost effective method and hence important in any research design.

For example- if a drug manufacturer would like to research the adverse side effects of a drug on country population. It is almost impossible to conduct a research study that involves everyone.

In this case, the researcher decides a sample of people from each demographic and then researches them, giving him/her indicative feedback on the drug's behavior.

Types of sampling

1. Simple random sampling:

It is one of the best sampling techniques that helps in saving time and resources.

It is a reliable method of obtaining information where every single member of a population is chosen randomly. Each individual has the same chance of being chosen to be a part of sample.

For example, in an organization of 500 employees, if the HR team decides on conducting team building activities, it is highly likely that they would prefer picking chits out of a bowl. In this case, each of the 500 employees has an equal opportunity of being selected.

2. Cluster sampling:

It is a method where entire population is divided into sections or clusters that represent a population.
Clusters are based on demographic parameters like age, sex, location etc.
This makes it very simple for a survey to derive effective inference from data.
For example if the United States government wishes to evaluate the number of immigrants living in the Mainland US, it can divide it in clusters based on states like California, Texas, Florida, Colorado, Hawaii, etc.
This way of survey will be more effective for results will be organized into states and provide insightful immigration data.

3. Systematic sampling:

In this method samples are of a population are selected at regular intervals.

It requires the selection of a starting point for the sample and sample size that can be repeated at regular intervals. This type of sampling method has a predefined range, and hence this sampling technique is less time consuming.

e.g. to collect a systematic sample of 500 people in a population of 5000.

In numbers element of population from 1- 5000 we can choose every 10th individual as a part of sample.

4. Stratified random sampling:

It is a method in which the population is divided into smaller groups that don't overlap but represent the entire population.
From these groups samples can select separately.
e.g. for analyzing characteristics of families belonging to different annual income divisions will create strata (groups) according to annual family income.
E.g. income less than $20,000, $21,000 – $30,000, $31,000 to $40,000, $41,000 to $50,000, etc. By doing this characteristics of people belonging to different income groups can be drawn.

What is non- random sampling?

Non- random sampling is defined as a sampling technique in which selected samples based on subjective judgment rather than random selection.

It is a less stringent method. This sampling method depends heavily on the expertise of the researchers.

It is carried out by observation, and it is widely used for qualitative research.

In this method all members among population have no equal chance of selection.

Each member of population has a known chance of selection.

It is most useful for exploratory studies like a pilot survey.

Judgmental or Purposive sampling:

In this method samples are based on the researcher's knowledge. Researcher choose only those people which are fit to participate in study. It is not a scientific method. In this technique preconceived notions of a researcher can influence on results. Thus, this technique involves a high amount of ambiguity.

Quota sampling:

If researcher wants to study the career goals of male and female employees in an organization. There are 500 employees in organization, are population. To understand better about population, researcher need only a sample and not entire population. Further, researcher is interested in particular strata within the population.

Merits of sampling

1. Economical: It is economical, because there is no need to collect all data. Instead of getting data from 5000 farmers, we get it from 50-100 only.
2. Less Time Consuming: As no of units is only a fraction of total universe, time consumed is also a fraction of total time.
3. Reliable: If sample is taken judiciously, the results are very reliable and accurate.
4. Convenience: In smaller number of units better enumerators can be employed by the organization.

5. More Scientific: This technique has four important advantages based on:

(a) Law of Statistical Regularity

(b) Law of Inertia of Large numbers

(c) Law of Persistence

(d) Law of Validity.

6. Detailed Enquiry:

A detailed study can be undertaken in case of the units included in the sample. Size of sample can be taken according to time and money available with the investigator.

7. Indispensable Method:

If universe is bigger, there remains no option but to proceed for this method. It is specially used for infinite, hypothetical and perishable universes.

Demerits:

1. Absence of Being Representative: Methods, such as purposive sampling may not provide a sample, that is representative.
2. Wrong Conclusion: If the sample is not representative, the results will not be correct. These will lead to the wrong conclusions.
3. Small Universe: Sometimes universe is so small that proper samples cannot be taken not of it. Number of units are so less.
4. Specialized Knowledge: It is a scientific method. Therefore, to get a good and representative sample, one should have special knowledge to get good sample and to perform proper analysis so that reliable result may be achieved.
5. Inherent defects: The results which are achieved though the analysis of sampling data may not be accurate as this method have inherent defects. There is not even a single method of sampling which has no demerit.
6. Sampling Error: This method of sampling has many errors.