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Unit -IV

SAMPLING

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SAMPLING

The researcher is concerned with the generalizability of the data beyond the sample. For studying any problem it is impossible to study the entire population. It is therefore convenient to pick out a sample out of the universe proposed to be covered by the study. The process of sampling makes it possible to draw valid inferences or generalizations on the basis of careful observation of variables within a small proportion of the population.

Meaning

Universe or Population : It refers to the totality of objects or individuals regarding which inferences are to be made in a sampling study.

It refers to the group of people, items or units under investigation and includes every individual.

First, the population is selected for observation and analysis.

Sample

It is a collection consisting of a part or subset of the objects or individuals of population which is selected for the purpose, representing the population sample obtained by collecting information only about some members of a population.

Sampling

It is the process of selecting a sample from the populat.

TYPES OF SAMPLING

1. Probability Sampling and
2. Non-Probability Sampling

PROBABILITY SAMPLING

Following are the types of probability sampling

1. Simple random sampling
2. Systematic sampling
3. Stratified sampling
4. Cluster sampling

1. Simple Random Sampling

In this all members have the same chance (probability) of being selected. Random method provides an unbiased cross selection of the population. For Example, we wish to draw a sample of 50 students from a population of 400 students. Place all 400 names in a container and draw out 50 names one by one.

2. Systematic Sampling

Each member of the sample comes after an equal interval from its previous member. For Example, for a sample of 50 students, the sampling fraction is 50/400 = 1/8 i.e. select one student out of every eight students in the population. The starting point for the selection is chosen at random.

3. Stratified Sampling

The population is divided into smaller homogenous group or strata by some characteristic and from each of these strata at random members are selected. For Example, population is Christian community of greater Mumbai region. It is divided into strata as professionals, skilled workers, Laborers and Managers then from each strata sampling fraction. i.e. Sample size / Total population x Total No. in the strata is chosen. Finally from each stratum using simple random or systematic sample method is used to select final sample.

4. Cluster Sampling (Area Sampling)

A researcher selects sampling units at random and then does complete observation of all units in the group. For example, your research involves kindergarten schools. Select randomly 15 schools. Then study all the children of 15 schools. In cluster sampling the unit of sampling consists of multiple cases. It is also known as area sampling, as the selection of individual member is made on the basis of place residence or employment.

5. Multistage Sampling

The sample to be studied is selected at random at different stages. For example, we need to select a sample of middle class working couples in Maharashtra state. The first stage will be randomly selecting a specific number of districts in a state. The second stage involves selecting randomly a specific number of rural and urban areas for the study. At the third stage, from each area, a specific

number of middle class families will be selected and at the last stage, working couples will be selected from these families.

NON-PROBABILITY SAMPLING

1. Purposive Sampling
2. Convenience Sampling
3. Quota Sampling
4. Snowball Sampling

1. Purposive Sampling

In this sampling method, the researcher selects a "typical group" of individuals who might represent the larger population and then collects data from this group. For example, if a researcher wants to survey the attitude towards the teaching profession of teachers teaching students from lower socio-economic stratum, he or she might survey the teachers teaching in schools catering to students

from slums (more specifically, teachers teaching in Municipal schools) with the assumption that since all teachers teaching in Municipal schools cater to students from the lower socio-economic stratum, they are representative of all the teachers teaching students from lower socio-economic stratum.

2. Convenience Sampling

It refers to the procedures of obtaining units or members who are most conveniently available. It consists of units which are obtained because cases are readily available. In selecting the incidental sample, the researcher determines the required sample size and then simply collects data on that number of individuals who are available easily.

3. Quota Sampling

The selection of the sample is made by the researcher, who decides the quotas for selecting sample from specified sub groups of the population. Here, the researcher first identifies those categories which he or she feels are important to ensure the representativeness of the population, then

establishes a sample size for each category, and finally selects individuals on an availability basis. For example, an interviewer might be need data from 40 adults and 20 adolescents in order to study students' television viewing habits. He therefore, will go out and select 20 adult men and 20 adult women, 10 adolescent girls and 10 adolescent boys so that they could interview them about their students' television viewing habits.

4. Snowball Sampling

In snowball sampling, the researcher identifying and selecting available respondents who meet the criteria for inclusion in his/her study. After the data have been collected from the subject, the researcher asks for a referral of other individuals, who would also meet the criteria and represent the population of concern.

Importance and Uses in Research.

1. Informs Methods on Data Collection

By pre-emptively identifying the statistical test(s) you want to employ to help answer your research question(s), hopefully you know what sort of data needs to be collected. Where statistics comes in handy is helping you identify key aspects you may not have considered in your chosen methods of data collection. Such may come in the form of identifying an additional variable of importance to collect data on. Another pitfall statistics can help you avoid is that of pseudoreplication. Pseudoreplication is particularly dangerous for several reasons: Firstly, it paints a false image of how large a sample size is and ignores the need for "true" replicated treatments (when applicable). Sample sizes are important as they determine the power of your statistical tests and therefore the confidence and scope of your conclusions based on the statistical results. Secondly it fails to highlight that some variables may not be independent. This may mask the true effects of the variables that you wish to be examining independently. Sampling bias can also be avoided when considering the statistical test you

hope to use: for example research on the occurrence of domestic violence in households should investigate low-income, middle-income, and high-income neighbourhoods.

1. Used To Support or Negate a Hypothesis

Without statistical tests there would be no objective way to show whether the data are in support or in disagreement of research questions. Since the burden of evidence (for or against) lies in results of statistic tests, without the use of statistics in research, we would be buried in unknowns, more questions, open-ended conclusions, and more data than we can handle! Without statistical research, we would be unable to credit new discoveries, answer new questions, and confidently advance with new developments. Statistical tests form the basis on each we can trust what the data is saying and make sense of what the raw, volumes of data are communicating.

2. Seeks out Uncertainty, Errors, and Outliers in the Data

Data is rarely squeaky clean and more often than not, data is messy, ugly and incomplete: Such is the nature of sampling data, there are answers people do not answer completely, truly, or circumstances beyond our control that prevent us to collect all the data points we desire: e.g. an inaccessible village of HIV+ patients trapped in a war zone, the premature death of chicks in a nest, apparatus failure, or the sudden crash in stocks. Truth of the matter is there is no way to collect ALL data points – this is where inferential statistics saves the day. Beyond those limitations, at the very minimum there is human error in data sampling or collection and with every tool, a measure of uncertainty. Errors can also arise due to uncontrollable circumstances as aforementioned, or due to a limitation of a statistical test. These errors can be accounted for to some degree in statistical models and tests so that we can cut through all the noise and assess our hypotheses honestly.

3. Aid Interpretation, Summarization, and Communication of Datasets:

Having utilized the appropriate statistical test, fair and objective conclusions, implications, can now be interpreted from the dataset. Statistical tests provide us with the means to interpret the dataset accurately so that we can make unbiased decisions on how to proceed knowing what the data is saying. It also guides the way we communicate our results and calls for us to defend why these statistical tests were chosen and how we arrived at our explanations based on a series of numbers. Statistics are also a great way of communicating and condensing large datasets into digestible, bitesize pieces of information easily understood by the masses. These summary statistics are helpful in providing people with an immediate idea of the big picture and whether your conclusions are valid.

4. Multivariate Statistics and Modelling

Without statistics we would be unable to tease apart the multitude of effects that may be influencing our dependent variable. Furthermore we would not be able to identify which factors are working in conjunction to produce a compounded effect on our dependent variable. Statistical

modelling helps us deal with our multivariate statistical questions so that we can assess hypotheses from every possible angle. So for example, how do we know that domestic violence in neighbourhoods of various levels of income are not also affected by ethnicity, religion, and level of education? Some of the factors may be intertwined and using statistics helps us tease apart these details.