

## **A Note on Sampling Method**

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### **Introduction**

Research is a careful enquiry to discover truth. The objective of research is to gain knowledge, which is positively a social wealth that can be pooled and utilised for the welfares of men and society. Research being a careful enquiry it requires use of certain techniques or research methods. Research methods and techniques are chosen for collection of data, establishing relationship between the data and unknown phenomena and to evaluate the accuracy of the results achieved. Research methodologies directly affect the validity and generalizability of a study and in turn, play a vital role in knowledge development. Research methods are a central part of any type of research. “It refers to the “way” the researcher goes in his work. It refers not only to research methods and to techniques used but also gives an account of “why” a particular method is used in preference to others in reaching the desired goals of research. Further it indicates as to “how” the researchers prefer to go about his research work using these methods and techniques.” One such important research tool is sampling method.

### **Meaning of Sampling**

Sample is a group of subjects selected from a larger group and including less than all the subjects in that larger group. Sampling is a powerful tool in social research. Sampling is the statistical process of selecting a subset called a “sample” of a population of interest for purposes of making observations and statistical inferences about that population. One cannot study the entire populations because of feasibility and cost constraints, and hence, select a representative sample from the population of interest for observation and analysis. It is extremely important to choose a sample that is truly representative of the population so that the inferences derived from the sample can be generalized back to the population of interest.

### **Definitions of Sampling**

The sample method involves taking a representative selection of the population and using the data collected as research information. A sample is a “subgroup of a population” It has also been described as a representative “taste” of a group. The sample should be “representative in the sense that each sampled unit will represent the characteristics of a known number of units in the population” According to Goode and Hatt, “a sample is a smaller representation of a larger whole. According to Kothari it is representative of the total population...in order to produce a miniature cross-section. According to Mohsin, a sample is a portion of entire lot of certain kind of objects. The entire lot is called the universe or population. According to Wimmer and Dominick a sample is a sub set of the population that is taken to be representative of the entire population.” Sampling theory is important to understand in regards to selecting a sampling method because it seeks to “make sampling more efficient.”

### **Sampling Technique**

The procedure adopted to draw the sample may be termed as sampling technique and the definite plan for obtaining the sample from the universe is

termed as sampling design. The sampling process comprises of several stage. The first stage is defining the target population. A population can be defined as all people or items (unit of analysis) with the characteristics that one wishes to study. The unit of analysis may be a person, group, organization, country, object, or any other entity that you wish to draw scientific inferences about. Sometimes the population is obvious. For example, if a manufacturer wants to determine whether finished goods manufactured at a production line meets certain quality requirements or must be scrapped and reworked, then the population consists of the entire set of finished goods manufactured at that production facility.

The second step in the sampling process is to choose a sampling frame. This is an accessible section of the target population (usually a list with contact information) from where a sample can be drawn. However, sampling frames may not entirely be representative of the population at large, and if so, inferences derived by such a sample may not be generalizable to the population. The last step in sampling is choosing a sample from the sampling frame using a well-defined sampling technique. Sampling techniques can be grouped into two broad categories: probability (random) sampling and non-probability sampling. Probability sampling is ideal if generalizability of results is important.

### **Preference to sampling method**

Cochran posits that using correct sampling methods allows researchers the ability to reduce research costs, conduct research more efficiently (speed), have greater flexibility, and provides for greater accuracy. Though human behaviour, which is the basis for any social research, is complex, there is underlying homogeneity and common problems that may help to draw representative sample. Similarity of the elements in a universe gives raise to sample studies. That is how needs of the people at large are estimated. Another assumption is that mathematical precision, absolute accuracy in the matters of socio-legal phenomena is not required, and it is enough if broad generalisations can be drawn and fair and relative accuracy is enough.

### **Advantages and Limitations of sampling method**

In a research it is not always required, possible or desirable in view of the time and resources constraint to consult every unit of the target group or observe the phenomena in detail. Analyzing large masses of data may be proved as a futile and unnecessary voluminous exercise. In such circumstances scientific use of sampling technique will be meaningful and useful. All the units, elements or items in the field of inquiry constitute *universe*. It is also known as *population*. If all the units are consulted and covered the method of research is *census method*. It assures highest accuracy and concrete description of a phenomenon without any element of bias as all the elements are taken into consideration without any chance of being left. Certain studies always require this method. For example, population census, literary digests, utility subscriptions, voting registrations etc., where one cannot opt for sampling. This type of inquiry involves large paraphernalia, time, money and energy besides organizational abilities. Further advantages of sampling can be enlisted as saving of the time and cost reduction, provides quicker results, saves human resources, assures accuracy of results if properly executed, and it is regarded as the only method when census method could not be adopted. In addition, a tool that is amenable to statistical analysis and testing. Lastly, it helps the researcher when his study is pertaining to the universe, where the universe

may be finite or determinable universe or may be infinite where the possibility of covering all the elements will not be there. In order to overcome the difficulties in conducting the census method a scientific sampling design is advocated.

However, on its flip side, it has to be used cautiously. That is, data should be carefully collected lest the wrongful entry of the characteristics may result in large bias. Requires specialized knowledge of the sampling techniques in order to execute the work. There are many chances of systemic bias or sampling errors are more if the adopted method is not suitable or defective. If it is a very complicated and complex phenomena sampling technique may not facilitate representative sample, by very nature as noted require only census method, if the universe itself is small representative sample may not be possible.

### **Characteristics of good Sample:**

Sampling is truly representative in nature. If proper devices to control sampling error are used then it is a useful tool in research. A good sample fairly and accurately fit into the description of the whole. It facilitates inference about the phenomena with unknown or large parameters and it serves as a technique to statistically test the hypothesis. It is a technique, which is viable in the terms of both human and monetary resources. It is capable of yielding precise estimates and leads to accurate results, helping in drawing proper inference.

### **Types of Sampling Method**

Two standard categories of the sampling method exist. These two categories are called probability sampling and non-probability sampling. Probability sampling is sometimes called random sampling as non-probability sampling is sometimes called non-random sampling. These terms are interchangeable. It is important to note that all sample selection methods described are selection without replacement, that is “once a unit is selected in the sampling process, it is removed from the pool eligible for future selection”

The choice to use probability or non-probability sampling depends on the goal of the research. When a researcher needs to have a certain level of confidence in the data collection, probability sampling should be used. The two sampling methods “differ in terms of how confident we are about the ability of the selected sample to represent the population from which it is drawn.”

Probability samples can be “rigorously analyzed to determine possible bias and likely error.” Non-probability sampling does not provide this advantage but is useful for researchers “to achieve particular objectives of the research at hand.” These objectives may allow for selection of the sample acquired by accident, because the sample “knows” the most, or because the sample is the most typical. Probability and non-probability sampling have advantages and disadvantages and the use of each is determined by the researcher’s goals in relation to data collection and validity. Each sampling category includes various methods for the selection process.

Probability Sampling provides an advantage because of researcher’s ability to calculate specific bias and error in regards to the data collected. Probability sampling is defined as having the “distinguishing characteristic that each unit in the population has a known, nonzero probability of being included in the sample.” It is described more clearly as “every subject or unit has an equal chance of being selected” from the population. It is important to give everyone an equal chance of

being selected because it “eliminates the danger of researchers biasing the selection process because of their own opinions or desires.”

Four types of probability sampling are standard across disciplines. They are, simple random sampling, systematic random sampling, stratified random sampling, and cluster sampling. Two types of stratified random sampling include proportionate and disproportionate. Proportionate stratification is “often done to insure representation of groups that have importance to the research” and disproportionate is “done to allow analysis of some particular strata members or to increase the overall precision of the sample estimates.” The big difference between the two stems from the use of a fraction. Proportionate stratified uses the same fraction for each subgroup and disproportionate uses different fractions for each subgroup. To choose which is right for a research project, the researcher must be aware of the various numbers of members in each subgroup.

Non-probability Sampling is convenient way for researchers to assemble a sample with little or no cost and/or for those research studies that do not require representativeness of the population. Non-probability sampling is a good method to use when conducting a pilot study, when attempting to question groups who may have sensitivities to the questions being asked and may not want answer those questions honestly, and for those situations when ethical concerns may keep the researcher from speaking to every member of a specific group. Non-probability sampling includes various methods. None of the resources agrees on all of them. Some of the common ones are Convenience Sampling, Purposive Sampling, snowball, and Quota sampling. Despite their advantages and disadvantages if sampling methods are chosen judiciously then it helps the researcher to a great extent.

### **Conclusion**

Researchers may choose from a variety of sampling methods. The researcher goals inform which sampling method is best for the research to be conducted. The main choice in regards to sample method is whether the researcher desires to generalize the results from the sample to the entire of the population being studied. Being aware of possible errors due to the sample method chosen is also very important. Many sample method choices are available and the researcher must choose the method that is right for the study.