Data Collection: Challenges in Statistical Research

Abstract:

To achieve solution of the research questions, we require to get and interpret data from various sources and answer of the research is depends on which types of data are collected and the data collection methods are used. In this paper try to explore various types of data, methods of data collection and limitations of them.

Key Words: *Data, Survey Methods and Limitations.*

Introduction:

To get answer of the research questions, we need to collect, analyze and interpret data from various sources and answer of the research is depends on which types of data are collected and the data collection methods are used. At recent time the data collection for statistical surveys is facing many challenges. In this information era, information are everywhere. The demand for timely information is increasing. On the other hand, a survey methods and respondents has changed. New approaches are needed. Old methods of survey are declining today so there is a need of new data collection strategies. So to meet the required information we have to use new methods by using new technologies. To achieve perfect and complete data on time is quite difficult now a day. There is a need to be coordinated with regard to sampling, questionnaire and communication strategy design. In this paper try to explore various types of data, methods of data collection and limitations of them.

Data types:

Primary Data:

Means data are collected from original sources. When data is obtained directly from individuals and objects. These types of data are firsthand data so they are trustworthy, it can be managed how the data is collected and can be monitored its quality. It is used for special research.

(II)Secondary Data:

Means information received by second source not from original source. These types of data are collected by someone else not by researcher; he or she depends on some other sources. These types of data are already passed through statistical process. It is a compilation of data. E.g. information of no of people living in particular area either by census data or by voter card registered or by birth- death register etc. its time and money saving method to collect data. Secondary data may either be published or unpublished. Published data accessible through local, state, central governments publication as well as foreign publications, Journals, books, magazines, newspapers, business and industrial reports, reports of banks and stock exchange, scholars' research reports from various fields etc. Researcher must be cautious in using secondary data. Reliability and suitability of data must be tested, Adequacy of data must be also checked by researcher and researcher should not accept the data from unauthentic sources, always select sources with precautions.

As we know Primary and secondary data are classified into two parts like quantitative and qualitative:

Quantitative Data: Means numeric and conclusive data with statistics which is giving us complete information, e.g. we can collect data of people living in society like total no of people, their age, birth date, address, education , skills, job types, etc. If we obtain the particular data of each set of measurements, we have meaningful information about the average value for each of those participant characteristics.

Qualitative Data:

Means data which are not containing measurable information e.g. A study related to social condition and attitude of particular society included like attitude of people towards civic rules, moral values, help to needy people etc.

Methods are used to Collect Data:

Primary data are collected either by experiments or by surveys.

Experiment:

An experiment is a data collection method in which researcher investigates about factors and variables and its effects. Experiments are conducted intentionally so researcher changes some variable and observes their effects on other variables. It provides systematic & logical methods for answering questions. It is mostly related with physical & natural science.

Survey:

A survey is a data collection method in which researcher selects a sample of respondents from concern fields or from all. It is also known as sampling. This method related with exist conditions. Researcher can't manipulate the variables. Surveys are related with hypothesis & testing variable. Surveys are conducted in descriptive research. Surveys are generally used for social & behavioral study. There are many methods of collecting data in surveys. Some important methods are as follows:

Observation Method:

This is the most useful method in studies of behavioral science. An observation is a scientific tool and planned systematically and tries to control on validity and reliability. In this method information is collected directly by researcher without asking the respondents. This method related with present scenario; not with past or future. Observation may be divided into several parts as structured and unstructured and controlled and uncontrolled observation etc.

Focus Groups Method:

In focus group data collection method, researcher identifies a group of 6 to 10 people with similar characteristics. A moderator then guides a discussion to identify attitudes and experiences of the group. The responses are captured by video recording; voice recording or writing- this is the data researcher will analyze to answer his or her research questions.

Interviews Method:

Data collection is also done by personal interview and telephonic interview of respondents. Personal interview is suitable for intensive research. It is structured or unstructured. Structured interview is a set of planned questions with standardize techniques so it becomes rigid. While unstructured interview is more flexible, it allowed interviewer more freedom to ask questions, even change it or omit it. According to researcher's requirement he or she may choose the types of it. It is useful to get more and deft information about respondent's feelings and beliefs more easily by this method.

Limitations:

To obtain answer of the research questions various types of data and methods of data collection are available but they have some limitations also, which become challenges for researcher. Here they are summarized as follows:

➢ Qualitative data cannot be easily summarized using statistics.

➢ To collect primary data is more expensive and time consuming than secondary data collection.

➢ Secondary data may be incomplete, inaccurate, outmoded, missing and restricted.

➢ Sample Surveys limitation is when researcher fails to select a sample correctly; without an appropriate sample, the results will not accurately generalize the population.

- ➢ Experiments are very expensive and more time required than other methods.

- ➢ Personal interview method is more expensive, time consumer and may be bias.

- ➢ Telephone interview method's main limitations are hard to gain the trust of respondents. Due to this reason, you may not get responses or may introduce bias and also limit the amount of data you can collect.

- ➢ Online interviewing researcher cannot get a representative sample and cannot seek clarification on responses that are unclear.

- ➢ Mailed questionnaires cannot be used to interview respondents with low literacy, and cannot seek clarifications on responses.

- ➢ In focus group data collection method dominant participants can influence the responses of others.

Conclusion:

As discussed above, there are different methods of data collection for any research. Researcher should decide whether the data is already accessible or to be collected for research. After it he or she should select the suitable methods for his or her research problem. According funds' and time availability researcher should select method of data collection. Although various types of methods available, they all have merits and demerits along with, so researcher should use them carefully. The most important matter regarding to select methods of data collection depends on the problem of research, time and other sources available, another thing is ability and experience of researcher is also a key factor. Thus the data collection is a big task and it becomes challenging day by day.

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Dr. Mayank R. Desai
Assistant Professor
Department of Statistics
Sir K. P. College of Commerce
Surat