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Collection of Data

SAMPLING AND NON-SAMPLING

ERRORS

Sampling Errors

A population consisting of numerical values has two important characteristics which are of relevance here. First, Central Tendency which may be measured by the mean, the median or the mode. Second, Dispersion, which can be measured by caculating the “standard deviation”, ‘‘ mean deviation”, “ range”, etc.

The purpose of the sample is to get one or more estimate of the population parameters. Sampling error refers to the difference between the sample estimate and the corresponding population parameter (actual value of the characteristic of the population for example, average income, etc). Thus, the difference between the actual value of a parameter of the population and its estimate (from the sample) is the sampling error. It is possible to reduce the magnitude of sampling error by taking a larger sample.

Example

Consider a case of incomes of 5 farmers of Manipur. The variable x (income of farmers) has measure-ments 500, 550, 600, 650, 700. We note that the population average of (500+550+600+650+700) ÷ 5 = 3000 ÷ 5 = 600. Now, suppose we select a sample of two individuals where x has measurements of 500 and 600. The sample average is (500 + 600) ÷ 2 = 1100 ÷ 2 = 550. Here, the sampling error of the estimate = 600 (true value) – 550 (estimate) = 50.

Non-Sampling Errors

Non-sampling errors are more serious than sampling errors because a sampling error can be minimised by taking a larger sample. It is difficult to minimise non-sampling error, even by taking a large sample. Even a Census can contain non-sampling errors. Some of the non-sampling errors are:

Sampling Bias

Sampling bias occurs when the sampling plan is such that some members of the target population could not possibly be included in the sample.

Non-Response Errors

Non-response occurs if an interviewer is unable to contact a person listed in the sample or a person from the sample refuses to respond. In this case, the sample observation may not be representative.

Errors in Data Acquisition This type of error arises from recording of incorrect responses. Suppose, the teacher asks the students to measure the length of the teacher's table in the classroom. The measurement by the students may differ. The differences may occur due to differences in measuring tape, carelessness of the students, etc. Similarly, suppose, we want to collect data on prices of oranges. We know that prices vary from shop to shop and from market to market. Prices also vary according to the quality. Therefore, we can only consider the average prices. Recording mistakes can also take place as the enumerators or the respondents may commit errors in recording or trans- scripting the data, for example, he/ she may record 13 instead of 31.