Population and Samples

Introduction

In our daily routine through conversations with others, and through contact with media of various sorts (books, television, newspapers, and the like), we are continually being confronted with collections of facts or **data**.

- Statistics is the branch of scientific inquiry and summarising data, and for using information in the data to draw various conclusions.

- The purpose of this text is to introduce you to the methods used in the field of applied statistics.

- Descriptive methods are techniques both analytic and graphical that are used to simply describe a data set.

- Inferential methods are techniques that are used to draw conclusions or to make inferences about a large group of objects based on the observations of only a portion of the members of the group.

- Frequently, we wish to acquire information or draw some conclusion about an entire population consisting of all individuals or objects of a particular type.

- The population of interest might consist of cooking oil, manufactured by a particular company during the previous calendar year, or it might be the collection of all babies who had been inoculated with the six killer diseases, or it might consist of all Ghanaian Tertiary Institutions.

- The data at our disposal frequently consists of a portion or subset of the population.

- Any such subset is called a sample.

- For example if the population were all Ghanaian tertiary institutions, one sample would be University of Education, University of Ghana, Takoradi Polytechnic, Kumasi Polytechnic, University of Cape Coast.

Definition: Population in a statistical study is the group of objects about which conclusions are to be drawn.

Definition: A sample is a portion or subset of objects drawn from the population

- Statistical studies can be thought of as studies of the behaviour of one or more random variables.

- Associated with these random variables are certain constants or numerical measures, which are descriptive in nature.

- The average value of the variable over the entire population is such a measure that describes the value about which the values of the random variable tend to cluster.

- Measures such as these are called **population parameters.**

Definition: A population parameter is a descriptive measure associated with a random variable when the variable is considered over the entire population.

Definition A statistic is a descriptive measure associated with a random variable when the variable is considered only over a sample.

Statistic actually serve two purposes.

- it describes the sample itself and
- it allows us to make inferences about the population from which the sample is drawn.

Descriptive Statistics

Descriptive statistics can be divided into two general subject areas:

- Representation of data set using visual techniques.
- Representation of data set using some numerical summary measures.

Many visual techniques may already be familiar to the reader; **frequency tables, tally sheets, histograms, pie charts, bar graphs, scatter diagrams** and the like.

- At the pre-tertiary education the reader is expected to have studied the numerical summary measures for a given data set.

- These are; measures of location, (mean, median, and the mode, quartiles, percentiles) and measures of variability (variance, standard deviation).