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PARAMETERS AND STATISTIC

INTRODUCTION: Parameter and statistic are closely related terms that are important for determination of the sample size, it is very important to understand the two terms and the difference between them. Parameters are numbers that summarize data for entire population whereas, statistics are numbers that summarize data from a sample i.e. some subset of the entire population.

PARAMETER: It is a measure of a characteristic of an entire population (mass of all units under consideration sharing common characteristics) based on all the elements within that population. For example all people living in a city, all male teenagers of world and all items in a shopping bag.

STATISTICS: Statistics may be defined as a measure of characteristic saying something about a fraction (a sample) of population under study. A sample in statistic is a part or portion of a population. The goal is to estimate a certain population parameter. One can draw multiple samples from a given population and the statistic (result) will be obtained depending on the samples. So, using data about a sample or portion allows one to estimate the characteristics of entire population. For example estimation of average height of women older than 20 years of age, estimating amount of sodium consumed by children under the age of 10 years.

PARAMETER VS STATISTICS: Difference between parameter and statistics can be understood in the following manne-

- (1) A parameter is a fixed measure describing the whole population (population is a group of people or things with common characteristics). On the hand, a statistics is a characteristics of a sample, a portion of target population.
- (2) A parameter is fixed, unknown numerical value, while statistics is a known number and a variable which depends on the portion of the population.
- (3) Sample statistics and population parameter both use different statistical notations.
- (4) Parameters never change while statistics do change.
- (5) A parameter is a characteristic of a population and a statistic is a characteristic of a sample.
- (6) Statistic makes one guess about a population parameter based on a statistic computed from sample.

EXAMPLE OF PARAMETER AND STATISTICS: Following are the examples of parameters and statistics-

- 20% of U.S. senators voted for a specific measure. Since there are only 100 senators, one can count what each of them voted. This is a "Parameter".
- (2) 50% of people living in U.s. agree with the latest health care proposal. Researcher's cant ask hundreds of millions of the people if they agree, so they take samples, or part of the population and calculate the rest.

POPULATION PARAMETERS AND SAMPLE STATISTICS: A statistics is a characteristic of a group of population, or sample. One gets sample statistics when one collects sample and calculates the standard deviation and mean. Sample statistics can be used to make some certain conclusions about entire population. However, a particular sampling technique is needed to draw valid conclusions. In order to estimate

population parameters sample statistics is used. For instance, If we collect random samples of female teenagers above 20 years of age and measure their weight we can calculate the sample mean as an unbiased estimate of the population mean.