An Overview of Statistics---Chapter 1

Section 1.1: Definitions

Statistics - Statistics is the science of collecting, Organizing, analyzing, and interpreting data.

Data Sets - The are two type of data sets. Are called *populations* and *samples*

Variable - the name of the thing being specifically collected or observed.

Population - the set of all elements of interest in a particular study.

Sample - a subset of the population.

Note: A sample is chosen so that it is representative of the population. A sample is obtained from the population at random.

Parameter: A numerical description of a population characteristic, such as the population mean μ and population standard deviation σ. We explain μ and σ in chapter 3.

Statistic: A numerical description of a sample characteristic such as the sample mean $\bar{X}$ and sample standard deviation s. We explain $\bar{X}$ and s in chapter 3.

Descriptive Statistics - methods of organizing and summarizing information such as Numerical, Tabular, and graphical methods(see chapter 2).

Statistical Inference - process of using information from a sample to make a statement or evaluation.
Example:

A 1988 Newsweek/Gallup poll investigated whether or not adults preferred to stay at home or go out as their favorite way of spending time in the evening. The poll of 1500 adults concluded that the majority of adults (70%) indicated that "staying at home with family" was the favorite evening activity.

a. What is the population of interest in this study? Adults

b. What was the size of the sample? n=1500
c. Where was the descriptive statistic used in this study? 70%

d. Describe the process of statistical inference in this study. 70% of all adults preferred to stay home.

Types of Variables

Quantitative (Discrete & Continuous Variable) Numerically valued data.
Qualitative – a non-numerically valued data (arithmetic operations do not make sense).

Examples for the different types of variables:(weight, time, number of TV's in the house, number of m&m's in a bag, marital status, color of hair, ….)

Qualitative: A variable is qualitative if arithmetic operations do not make sense. (Marital status, color of hair, zip code, phone number)

Discrete: A variable is discrete if its value results from counting. (Number of kids in a family, number of TV's in the house, number of m&m's in a bag)

Continues: The variable is continuous if its value is measured. (Time, money, height, weight)

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