

# 1.1: AN OVERVIEW OF STATISTICS

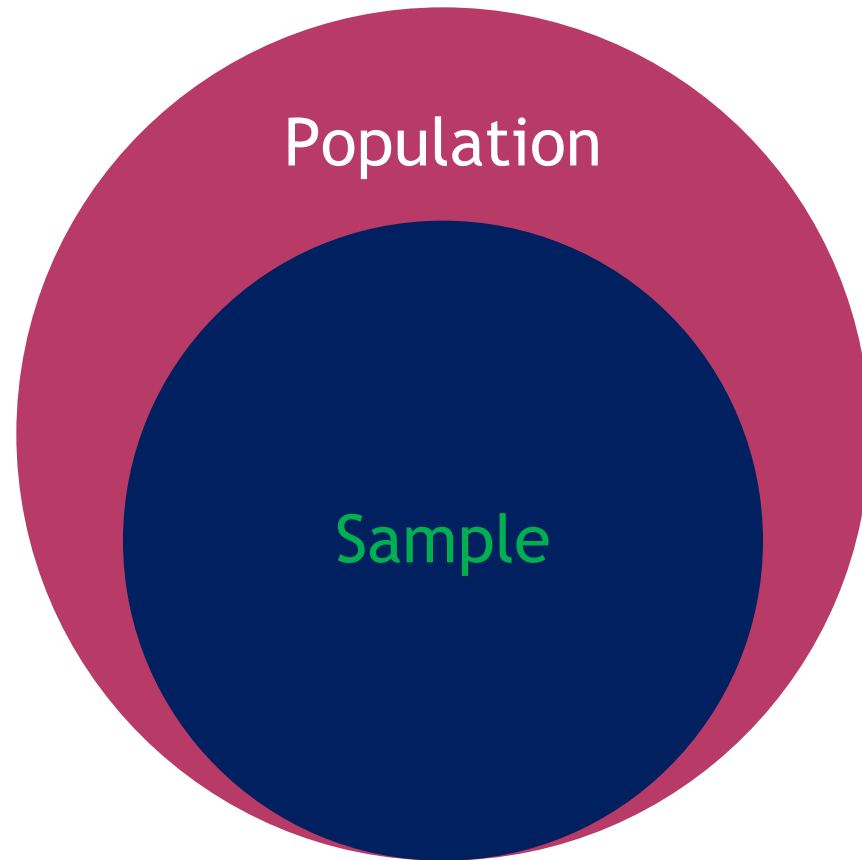
A Definition of Statistics

# A DEFINITION OF STATISTICS

- Data: consists of information coming from observations, counts, measurements, or responses.
- Statistics: is the science of collecting, organizing, analyzing, and interpreting data in order to make decisions.

# DATA SETS

- Population is the collection of all outcomes, responses, measurements or counts that are of interest.
- Sample is a subset of a population



Population

Sample

## EX 1:

- In a recent survey, 1708 adults in the United States were asked if they think global warming is a problem that requires immediate government action. Nine hundred thirty-nine of the adults said yes. Identify the population and the sample. Describe the data set.
- The population consists of the responses of all adults in the United States
- The sample consists of the responses of the 1708 adults in the United States in the survey.
- The data set consists of 939 yes's and 769 no's

○ A parameter is a numerical description of a *population* characteristic.

○ A statistic is a numerical description of a *sample* characteristic.

- Ex 2:
- Decide whether the numerical value describes a population parameter or a sample statistic. Explain your reasoning.
- 1. A recent survey of a sample of MBAs reported that the average salary for an MBA is more than \$82,000.
- Answer: Because the average of \$82,000 is based on a subset of the population, it is a sample statistic.

- 2. Starting salaries for the 667 MBA graduates from the University of Chicago Graduate School of Business increased 8.5% from the previous year.
- Answer: Because the percent increase of 8.5% is based on all 667 graduates' starting salaries, it is a population parameter.
- 3. In a random check of a sample of retail stores, the Food and Drug Administration found that 34% of the stores were not storing fish at the proper temperature.
- Answer: Because the percent of 34% is based on a subset of the population, it is a sample statistic.



# BRANCHES OF STATISTICS

- Descriptive statistics is the branch of statistics that involves the organization, summarization, and display of data.
- Inferential statistics is the branch of statistics that involves using a sample to draw conclusions about a population. *A basic tool in the study of inferential statistics is probability.*

## EX 3:

- ◉ Decide which part of the study represents the descriptive branch of statistics. What conclusions might be drawn from the study using inferential statistics?
- ◉ 1. A large sample of men, aged 48 was studied for 18 years. For unmarried men, approximately 70% were alive at age 65. For married men, 90% were alive at age 65.
- ◉ Answer: Descriptive statistics involves statements such as “for unmarried men, approximately 70% were alive at age 65” and “For married men, 90% were alive at 65”. A possible inference drawn from the study is that being married is associated with a longer life for men

- 2. In a sample of Wall Street analysts, the percentage who incorrectly forecasted high-tech earnings in a recent year was 44%.
- Answer: The part of this study that represents the descriptive branch of statistics involves the statement “the percentage of Wall Street analysts who incorrectly forecasted high-tech earnings in a recent year was 44%.” A possible inference drawn from the study is that the stock market is difficult to forecast, even for professionals.

ASSIGNMENT 1-1:  
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PROBLEMS