MODULE 7 STATISTICAL REASONING IN EVERYDAY LIFE

THE NEED FOR STATISTICS

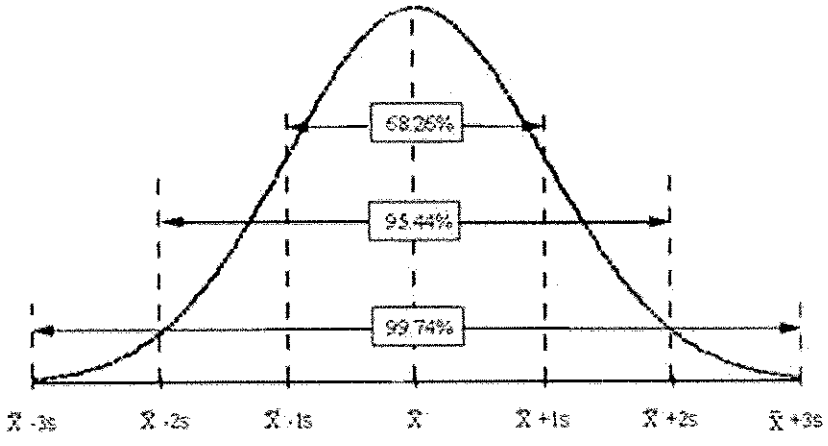
- "Off-the-top-of-the-head" estimates often misread reality and then mislead the public.

DESCRIPTIVE STATISTICS

- **DESCRIPTIVE STATISTICS** is a numerical data used to measure and describe characteristics of groups. Includes measures of central tendency and measures variation.
- One way to do this is to convert the data into a simple bar graph, known as a **HISTOGRAM**.
- Measures of Central Tendency is a single score that represents a whole set of scores. **MODE** is the most frequently occurring score or scores. **MEAN** is the total sum of all the scores divided by the number of scores. **MEDIAN** is the midpoint or the 50th percentile.
- If the distribution is lopsided, or **SKEWED**, by a few way-out scores that interrupt the mean's results.

MEASURES OF VARIATION

- A **RANGE** is the gap between the lowest and highest scores and only provides crude estimate of variation. **STANDARD DEVIATION** (SD) is a computed measure of how much scores vary around the mean score. Intelligence Scores are a SD. A distribution is striving to be a **NORMAL CURVE**, where the symmetrical, bell shaped curve describes the distribution of many types of data (68% fall within 1 standard deviation from the mean, 95% fall within 2 SD's, 99% fall within 3 SD's).



Normal Curve

INFERENTIAL STATISTICS

- **INFERENTIAL STATISTICS** is a numerical data that allow one to generalize – to infer from sample data the probability of something being true of a population.

WHEN IS AN OBSERVED DIFFERENCE RELIABLE?

- Representative samples are better than biased samples
- Less-variable observations are more reliable than those that are more variable.
- More cases are better than fewer.

WHEN IS A DIFFERENCE SIGNIFICANT?

- A STATISTICAL SIGNIFICANCE is a statistical statement of how likely it is that an obtained result occurred by chance.

BE ABLE TO ANSWER: Can you solve this puzzle?

The registrar's office at the University of Michigan has found that usually about 100 students in Arts and Sciences have perfect grades at the end of their first term at the University. However, only about 10 to 15 students graduate with perfect grades. What do you think is the most likely explanation for the fact that there are more perfect grades after one term than at graduation?

PRACTICE FRQ'S: Explain the difference between descriptive and inferential statistics in research.