

Basic Statistics I

- I. Populations and Samples
 - a. Population – contains all the members in the target group
 - b. Sample – will look like the population if:
 - i. Large enough
 - ii. Random – every event/observation has an equal chance of being included in the sample
 - iii. Random Sample vs Non-random (BIASED) Sample
- II. Descriptive vs Inferential Statistics (comparative)
- III. Descriptive Statistics
 - a. Types of data
 - i. Categorical
 1. nominal – named categories
 2. ordinal – named categories with order
 - ii. Continuous – #s which have meaning and interval b/w #s always has the same meaning
 - b. Central tendency
 - i. Mean = Sum/N
 - ii. Median = middle #
 - iii. Mode = most frequent category/#
 - c. Dispersion – shows "spread"
 - i. Range – difference b/w highest and lowest value
 - ii. Variance – how far from the mean a value lies; calculated by the Sum of $(X - \text{mean})^2/n$
 - iii. Standard deviation (SD) – Sq root of variance
 - iv. Standard error of the mean (SEM)- estimates how close the sample mean is to the population mean (with 95% confidence)
- IV. Normal distribution
 - a. Bell shaped, unimodal, and symmetrical
 - b. Mean, Median, Mode are same
 - c. Curve described mathematically by mean and SD

<u>Mean +/- SD</u>	<u>% data included under curve</u>
1	68%
1.96	95%
2	96%
3	99.7%

V. Z- score

- a. Reflects the "distance" in SD units, a given value lies from the mean of the distribution.
- b. Conversion of raw scores into z scores permits direct comparison of values and determination of percentiles in different types of tests or readings.
- c. Raw scores are converted to z scores by:

$$z = \frac{x - \bar{x}}{SD}$$

Where:

z = z score

x = raw score

\bar{x} = mean of the distribution

SD = standard deviation