Principles of Biostatistics

Activity 1

1. (a) The average height of children in a 4th grade classroom was 50 inches at the beginning of the year. During that year, each child grew by 2 inches. What was the average height at the end of the year?
   (b) What happens to the mean of a data set if you add the same number to each number in the data set? (Experiment with a few data sets until you figure this out.)
   (c) Can you write an equation to express the rule you discovered above?
   (d) Suppose $x_1, \ldots, x_n$ is a data set such that $\bar{x} = 20$. Define a new data set $y_1, \ldots, y_n$ by $y_i = x_i + 8$. What is $\bar{y}$?

2. (a) A group of newborn babies weighed 8 lbs on average. After five months, each baby’s weight doubled. What was their average weight at the end of five months?
   (b) What happens to the mean of a data set if you multiply each number in the data set by the same number?
   (c) Can you write an equation to express the rule you discovered above?
   (d) Suppose $x_1, \ldots, x_n$ is a data set such that $\bar{x} = 20$. Define a new data set $y_1, \ldots, y_n$ by $y_i = 4x_i$. What is $\bar{y}$?

3. Repeat problem 1 for variance and standard deviation (on part (a), assume $s = 3$ and on part (d), assume $s = 5$).

4. Repeat problem 2 for variance and standard deviation (on part (a), assume $s = 1$ and on part (d), assume $s = 5$).

5. What happens if you multiply by a number and add a number?