

Chapter 12

In this chapter, the topic covered is sample surveys. A sample survey involves making a judgment about the world at large. Three main ideas are needed to make this judgment.

The first idea is to draw a sample, which is a group of individuals selected from the entire population since examining the entire population is impractical. A key when doing this is to avoid bias. Bias is any method that over or under emphasizes a characteristic of a population. The many types of bias include: voluntary response bias, undercoverage, nonresponse bias, and response bias. Avoiding bias is important because conclusions based on bias are considered flawed. However, by selecting the sample at random one easily avoids it. The next big idea regarding sample surveys is randomization. By randomizing, we are protecting ourselves from the many seen and unseen influences of a population because we are making sure that on average the sample looks like the rest of the population. Finally, understanding sample size is very important because contrary to popular belief, the size of the fraction of the population is not important, but sample size is. For example, if you're testing soup for a larger banquet than the first one you had, you will have a bigger pot. However, this does not mean that you need a bigger spoon to taste the soup. The same spoon will be large enough to decide despite the pot size. There is no designated number for sample size it just had to be big enough to be representative of the whole population. Some think a method to avoid dealing with sample size is by doing a census, or survey of the entire population, but this is not true. They are difficult, expensive, impractical and complex. Also, they are easily thrown off because populations rarely stand still.

When doing a sample, creating a model can be useful. The model should include a population parameter, the mean, and the standard deviation.

There are multiple types of sample. The most common is a simple random sample, otherwise known as an SRS. It is a sample drawn so that each combination of people has an equal chance of being selected. When doing a simple random sample, it is important to determine a sampling frame, or list of individuals from which sample is drawn. When we compare these samples, the sample-to-sample



difference is known as sampling variability. Another type of sample is a stratified sample. Before this sample is selected the population is divided into sliced into homogeneous groups' calls strata which differ from one another. Then within each stratum samples are combined. A useful time for stratified sampling would be when comparing the views of two groups, such as men and women.



Cluster samples also involve dividing the population into groups. However, the clusters are not only heterogeneous, but they are more or less alike and resemble the population as a whole. After the population is divided into one or multiple clusters, a census is performed on each one. Multistage sample combine multiple sampling methods, such as performing as stratifying a population and then randomly choosing a representative. Suppose we want to select seniors to speak at a high school graduation. We decide to choose every tenth person on an alphabetical list of students. This is an example of a systematic sample. However, in order for it to be random we must start from a randomly selected individual. In a voluntary response sample, a large group is invited to respond and those who do are counted. Finally, there is a convenience sample. A convenience sample is simply when we include all the individuals who are convenient.