Week 1 Assignment

Adapted from *Statistical Reasoning for Everyday Life* (Bennett, Briggs, & Triola, 2017)

Understanding:

1. Define the terms as they apply to statistical studies: *sample, raw data, sample statistic, confidence interval, margin of error, census.*
2. Describe the five basic steps in a statistical study. Give an example of their application in a topic related to your research interests.
3. Explain why the following statement is true: The 95% confidence interval for a poll suggested that support for Governor Garcia is between 55% and 60%. Therefore, we can be certain that a majority of the population supports the governor.
4. Explain why this is false: One study of heart disease involved treating male physicians with daily doses of aspirin. Because the study concluded that aspirin helps males avoid heart disease, it follows that females can also avoid heart disease by taking aspirin.
5. What is peer review, and why is it useful?

Application:

1. In a Harris Interactive survey of 1006 adults, 86% say that they wash their hands after using a public restroom; the margin of error is 3 percentage points. *USA Today* reported that among 6028 adults observed in restrooms, 85% washed their hands; the margin of error is 1 percentage point. Use the given statistics and margin of error to identify the confidence interval for each study. Which study do you believe, and why?
2. In a survey of 1002 people, 701 (70%) said that they voted in the last presidential election (based on data from ICR Research Group). The margin of error for this survey was 3 percentage points. However, actual voting records show that only 61% of eligible voters actually did cast a vote. Does this imply that people lied when responding to the survey? Explain.
3. Describe how you would apply the five basic steps in a statistical study to the following research question: determine the percentage of drivers who text while they are driving.
4. The Journal of American Psychologists prints an article evaluating a new drug for depression. The researchers who wrote the article received funding for their labs from the pharmaceutical company that produces the drug. Is there potential for bias in this research study? How could it be avoided? Explain your answer.
5. A college dean obtains an alphabetical list of all full-time students at her college, and selects every 50th name on that list to survey those students regarding the total amount of student loan debt that they will have upon graduating. She then reports this average (mean) amount of debt among these students as the average of all college students. What type of sample of this? What could she do to improve her sample?
6. Explain any problems likely to cause confounding, and suggest how they could be avoided: in a comparison of gasoline with different octane ratings, 24 vans are driven with 87 octane gasoline, and 28 SUVs are driven with 91 octane gasoline. After each vehicle has been driven for 250 miles, the amount of gasoline consumed is measured.
7. Explain which of the 8 guidelines for evaluating a statistical study might be most relevant: In a survey of 1,200 college students, each was asked whether he or she was a good person.
8. The following presents a headline in a local newspaper, as well as the story summary. Discuss whether the headline accurately represents the story.

**Headline:** “Drugs Shown in 98% of Movies”

**Story Summary**: A “government study” claims that drug use, drinking, or smoking was depicted in 98% of top movie rentals (Associated Press).

1. What crucial information is missing from the following “sound bite”? A *USA Today* “Snapshot” reported that the percentage of people with diabetes who don’t know that they have diabetes is “1 in 4.” The source was given as the American Diabetes Association.
2. What crucial information is missing from the following “sound bite”? CNN reports on a Zagat survey of America’s top restaurants, which fund that “only 9 restaurants achieved a rare 29 out of a possible 30 rating, and none of these restaurants are in the Big Apple.”