Assignment - Chapter 9

Complete the following problems related to the chapter 9. Upload your work as a single PDF file before deadline.

1. In 2017 the Gallup poll surveyed 1021 adults in the United States and found that 57% supported a ban on smoking in public places. Identify the population and the sample. What is the parameter of interest? What is the statistic?

2. The Centers for Disease Control and Prevention (CDC) conducts an annual Youth Risk Behavior Survey, surveying over 15,000 high school students. The 2015 survey reported that, while cigarette use among high school youth had declined to its lowest levels, 24% of those surveyed reported using e-cigarettes. Identify the sample and population. Is the value 24% a parameter or a statistic? What symbol would we use for this value?

3. According to a 2018 Pew Research report, 40% of Americans read print books exclusively (rather than reading some digital books). Suppose a random sample of 500 Americans is selected.

   - What percentage of the sample would we expect to read print books exclusively?
   - Verify that the conditions for the Central Limit Theorem are met.
   - What is the standard error for this sample proportion?

4. According to a 2017 Gallup Poll, 617 out of 1028 randomly selected adults living in the United States felt the laws covering the sale of firearms should be more strict. Find a 95% confidence interval for the population proportion who favor stricter gun laws.

5. A 2016 Pew Research poll found that 61% of U.S. adults believe that organic produce is better for health than conventionally grown varieties. Assume the sample size was 1000 and that the conditions for using the CLT are met. Find and interpret a 95% confidence interval for the proportion of U.S. adults to believe organic produce is better for health. Similarly, find and interpret an 80% confidence interval for this population parameter.

6. A Harris poll asked Americans in 2016 and 2017 if they were happy. In 2016, 31% reported being happy and in 2017, 33% reported being happy. Assume the sample size for each poll was 1000. A 95% confidence interval for the difference in these proportions $p_1 - p_2$ (where proportion 1 is proportion happy in 2016 and proportion 2 is the proportion happy in 2017) is $(-0.06, 0.02)$. Interpret this confidence interval. Does the interval contain 0? What does this tell us about happiness among American in 2016 and 2017?

7. Pew Research reported that 46% of Americans surveyed in 2016 got their news from local television. A similar survey conducted in 2017 found that 37% of Americans got their news from local television. Assume the sample size for each poll was 1200. Construct the 95% confidence interval for the difference in the proportions of Americans who get their news from local television in 2016 and 2017. Based on your interval, do you think there has been a change in the proportion of Americans who get their news from local television? Explain.