



College Student Health Survey

The College Student Health Survey (CSHS), developed by Boynton Health Services, is used to collect health information from a random sample of Minnesota post-secondary students. The survey, given annually, provides information on these students' experiences and behaviors in the areas of health insurance and health care utilization, mental health, tobacco use, alcohol and other drug use, personal safety and financial health, nutrition and physical activity, and sexual health. You will use data collected by Boynton Health Services to answer the following research question:

What percentage of all Minnesota PSEO students used a vaping device in the past 30 days?

Each question is worth 1 point unless otherwise indicated.

Explore the Observed Data

One of the reported findings from the 2015 CSHS was that 3 of the 56 sampled Minnesota PSEO students used a vaping device in the past 30 days.

1. What percentage of Minnesota PSEO students sampled used a vaping device in the past 30 days?

Bootstrapping

Set up a bootstrap model in TinkerPlots based on the results in the observed data.

2. Copy-and-paste (or sketch) a picture of the TinkerPlots sampler window into your word-processed document.

Carry out 500 trials of the bootstrap simulation, *collecting the percentage* of PSEO students who reported they had vaped in the previous 30 days. Plot the 500 bootstrapped percentages.

3. Copy-and-paste the plot of the bootstrap distribution into your word-processed document.



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4. Compute and report the mean of the bootstrap distribution.
 5. Explain why the mean of the sampling distribution is close to the sample percentage. Be sure to refer to both the model you included in your TinkerPlots sampler and the sampling process in your response. **(2pts)**
 6. Compute and report the margin of error.
 7. Compute and report the endpoints of the compatibility interval. Show your work for full credit.
 8. Answer the research question posed at the beginning of the assignment. Use evidence from the bootstrap analysis to support your answer. **(2pts)**

Interpretation

9. Albert Hoffman's best friend, Zoey Johnson, works for the Health Services at California University of Liberal Arts (CalU). A survey of $N = 100$ Cal U students found that the sample percentage of CalU students that vape was identical to the sample percentage you computed in Question #1. If Zoey was to carry out a bootstrap simulation and produce a compatibility interval based on the CalU data, how would her interval compare to the interval you computed in Question #7? Explain. **(2pts)**
10. It turns out that the survey study at CalU sampled students from a single student residence hall. Explain why sampling students from a single residence hall would have an impact on the *external validity* of the study. **(2pts)**
11. Does sampling students from a single student residence hall have an impact on the *amount of uncertainty* (range of the compatibility interval) computed in the bootstrap interval? Explain.