Twitter Users and News

A poll of 300 people conducted in 2013 found that 52% of U.S. adult Twitter users get at least some news on Twitter. The bootstrapped standard error for this estimate was 2.9%.

```
library(tidyverse)
library(infer)
twitter <- tibble(get_news = c(rep("Yes", 52*3), rep("No", 48*3)))
twit_bstrap <- twitter |>
  specify(response = get_news, success = "Yes") |>
  generate(1000) |>
  calculate(stat = "prop")

twit_bstrap |>
  summarize(se = sd(stat))
```

```
# A tibble: 1 x 1
      se
   <dbl>
1 0.0294
```

```
twit_bstrap |>
  get_ci(0.99)
```

```
# A tibble: 1 x 2
  lower_ci upper_ci
     <dbl>    <dbl>
1     0.45    0.597
```

1. Examine the output above and write down a 99% confidence interval for the fraction of U.S. adult Twitter users who get some news on Twitter.

2. Interpret the confidence interval in context.

3. Identify each of the following statements as true or false. Provide an explanation to justify each of your answers.
   a. Since the standard error is 2.9%, we can conclude that 97.1% of all U.S. adult Twitter users were included in the study.

   b. If we want to reduce the standard error of the estimate, we should collect less data.

   c. If we construct a 90% confidence interval for the percentage of U.S. adults Twitter users who get some news through Twitter, this confidence interval will be wider than a corresponding 99% confidence interval.

   d. If we repeated this study 1,000 times and constructed a 99% confidence interval for each study, then approximately 990 of those confidence intervals should contain the true fraction of U.S. adult Twitter users who get at least some news on Twitter.

   e. The margin of error in this poll is less than 3 percentage points.

MeToo

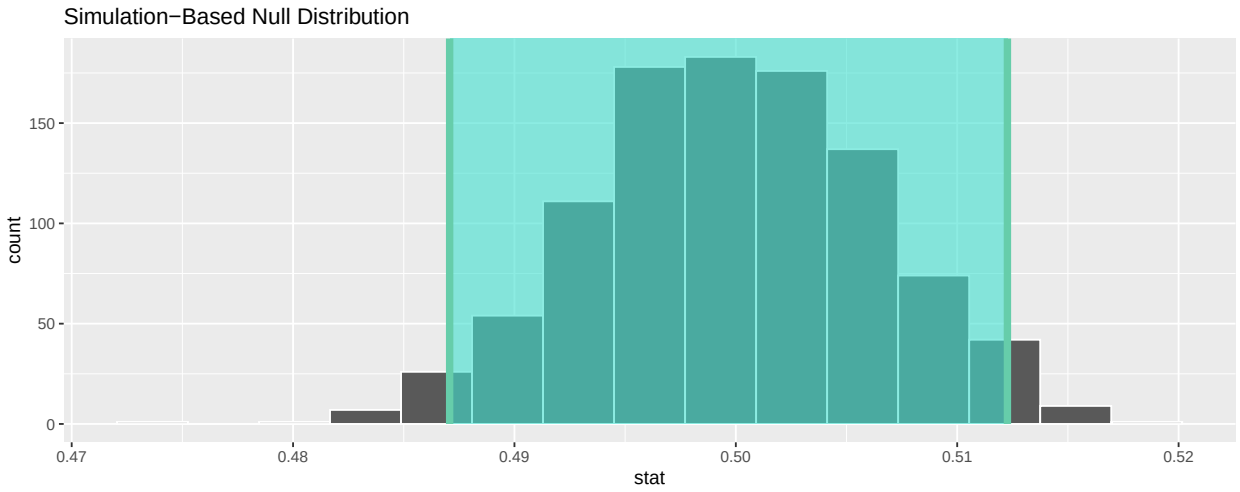
Five years after the "MeToo" hashtag went viral, about half of Americans who have heard of the movement express support for it, while 21% say they oppose it, according to a Pew Research Center survey conducted in July 2022. The poll was a random sample of 6,034 people, 2,926 of whom said they support #MeToo. Does this poll provide convincing evidence that the majority of those who have heard of #MeToo support it?

1. Write out the *null hypothesis* and the *alternative hypothesis* that are being evaluated, using proper notation.

2. Explain how you could use cards, a coin, or a die to simulate the *null distribution*.

3. What is the value of the observed *test statistic*?

4. In the null distribution below, label the axes, indicate with a vertical line the location of the observed test statistic, and shade the area under the curve corresponding to the p-value.



5. Using $\alpha = 0.05$, what is your decision regarding the viability of the null hypothesis?

6. Write *one* sentence to President Sarah summarizing what you've learned about support for #MeToo.