1. On April 4, 2017, Gallup published poll results on its web site under the headline, "Affordable Care Act Gains Majority Approval for First Time."

If this was a simple random sample of the 1023 adults in 2017, what would the conservative 95% confidence interval margin of error be?

   a) approximately 5%
   b) approximately .03%
   c) approximately 3.13%
   d) other

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Gallup gives a 95% confident margin of error of plus or minus 3% for the 2012 poll, which had 48% of the sample "approved." So the lower and upper boundaries for the confidence interval are 48% -3% = 45% to 51% = 48 % + 3%

2.

2012: 45% to 51% interval for the 95% confidence level

2017:

- First, compute the lower and upper boundaries for 2017 which had 55% of the sample "approved" and a margin of error plus or minus 4% for the 95% confidence level
- Second, was it likely a majority ($> 50\%$) in 2017?
- Third, could it have been a majority earlier—in 2012?

Is the headline "Affordable Care Act Gains Majority Approval for First Time" accurate?

a) yes, it was likely a majority, and also a majority for the first time

b) no, the headline isn't accurate

3. Assume little to no bias and truly a random sample. If a polling company conducted 100 such polls with a 95% confidence interval, then about how many of them are likely to include the true population percentage?

   a) 95
   b) 5
   c) other

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b) 5
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4. Is there any way to know which intervals from the 100 polls contain the true percentage and which ones don't?

a) yes
b) no
c) other

5. Gallup specifically targeted both landline and cellphone users in its polls. Are there any voices that are left out?

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What percentage of US population has a phone?
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6. How should we interpret the margin of error if the sample is biased?

  a) It is still valid as is
  b) Garbage in garbage out, so the margin of error would not represent the entire population, although it would still be useful to interpret whatever biased sample it did represent.

7. For a simple random sample at the 95% confidence level, what sample size would be required to achieve a plus or minus 1% margin of error?

  a) 1
  b) 100
  c) 1000
  d) 10000
  e) other

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8. In which of the following examples will the margin of error be the smallest? Assume each refers to a random sample that is not biased for a 95% confidence interval.

a) a sample of n = 1000 from a population of 10 million
b) a sample of n = 2500 from a population of 200 million
c) a sample of n = 400 from a population of 50,000
d) other

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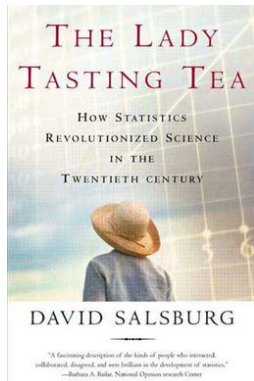
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Chicken Soup versus Literary Digest

https://news.gallup.com/home.aspx

9. What was the main point of Fisher's experiment on the Lady Tasting Tea?

   a) sample size and random representative selection is what is important—not the percentage of the overall population
   b) we can't assume that unusual data is incorrect
   c) statistical significance can be obtained by deciding in advance the level of confidence we accept as persuasive and to collect data to make reasoned inferences

THE LADY TASTING TEA

HOW STATISTICS REVOLUTIONIZED SCIENCE IN THE TWENTIETH CENTURY

DAVID SALSBURG

"A fascinating description of the kinds of people who interacted, collaborated, disagreed, and were brilliant in the development of statistics."
—Barbara A. Bailar, National Opinion research Center

Front cover for *The Lady Tasting Tea* by David Salsburg