

Lesson 56: Calculating n for a confidence interval of a proportion

Daily Data Collection

Q1: Agree or Disagree: The climate is warming.

Q2: Agree or Disagree: A significant amount of the change is caused by human activity.

Create a two way-table. Then construct a 95% confidence interval for each box.

Choosing the Sample Size when sampling to estimate a population mean:

When we designed confidence intervals for population means we often times researched ahead of time how large of a sample we would need in order to get a certain margin of error with certain confidence. This notion also holds true when designing confidence intervals for proportions. The following are the algebraic steps in deriving the formula:

The margin of error for a confidence interval for p is $m = z^* \sqrt{\frac{\hat{p}(1 - \hat{p})}{n}}$.

Since we don't know p-hat until we actually conduct the study we have a problem. We can then do one of two things:

- a) Use an estimated p-hat based on previous studies
- b) Use a conservative p-hat = 0.5. Using a p-hat of 0.5 gives the largest possible margin of error for any given z or n. We will use this option most of the time.

Examples:

Before conducting nationwide polling prior to a national election, most good companies will decide ahead of time how many people to include in the poll based on a particular margin of error and confidence interval. Lets say that Gallop wants to conduct a poll to see what proportion of the voters would vote for Bush if George Bush were running for president today against John Kerry? Gallop wants to be 95% confident with a margin of error no more than 3 percentage points. How many people must they randomly sample in order to achieve this?

A Gallop poll asking 1,200 people if they have a tattoo reports that the 38% percent have a tattoo with a margin of error of ± 0.02453 Find the confidence level.

HW 56 (From section 8-2): 37, 41, 43, 47, 49-52

From kevinfraker.com/stats.html scroll down to CH 9 and watch "Youtube link for ALL Experiments are Wrong"