

Section 8.1 Estimates and Confidence Intervals

Example 1. Suppose that a statewide poll about who will win the Democratic Primary election produces a 95% confidence interval of (0.48, 0.54) for estimating the proportion of registered PA Democrats who will vote for Hillary.

This means that _____

Example 2. A recent GSS asked, "During the last year did anyone take something from you by using force – such as a stickup, mugging or threat?" Of 987 subjects randomly chosen from U.S. adults, 17 answered yes and 970 answered no.

- Find the point estimate of the population proportion who would answer yes, if you could possibly ask them all.
- Find the standard error.
- Find the margin of error for a 95% confidence interval.
- Describe in English the 95% confidence interval for this population proportion.

"We are 95% confident that _____

_____."

Example 3. A national television network takes an exit poll of 1400 voters after each has cast a vote in a state gubernatorial election. Of them 660 say they voted for the Democratic candidate and 740 say they voted for the Republican candidate. Treating the sample as a random sample from the population of all voters, answer the following questions and decide if you can predict the winner?

- Find the point estimate of the population proportion who would answer yes, if you could possibly ask them all.
- Find the standard error.
- Find the margin of error for a 95% confidence interval.
- Describe in English the 95% confidence interval for this population proportion.

"We are 95% confident that _____

_____."

- Describe in English the 99% confidence interval for this population proportion.

"We are 99% confident that _____

_____."

Problems from Online Homework

#2. When 508 subjects were asked, "Do you believe in heaven?" the proportion who answered yes was 0.77. The standard deviation (a.k.a., standard error) of this point estimate is 0.02.

a. Find and interpret the margin of error for a 95% confidence interval for the population proportion of people who believe in heaven.

b. Construct the 95% confidence interval.

#4. When a survey asked subjects whether they would be willing to accept cuts in their standard of living to protect the environment, 337 of 1130 subjects said yes.

a. Find the point estimate of the proportion of the population who would answer yes.

b. Find the margin of error for a 95% confidence interval.

c. Construct the 95% confidence interval for the population proportion. Give the answer as an interval (_____ , _____) and say what it means in English.

#5. A survey asks, "If the husband in a family wants children, but the wife decides that she does not want any children, is it all right for the wife to refuse to have children?" Of 734 subjects, 567 said yes.

• Find the 99% confidence interval: (_____ , _____)

• Without doing a calculation predict whether the 95% confidence interval will be wider or more narrow. Do the calculation to check your intuition.

95% confidence interval: (_____ , _____)