

STAT 312 Week 10 Class

Review of Random Sampling

Using statistical language, explain why it is important for as many students to fill out the course evaluations as possible.

- larger sample size
- avoid nonresponse bias. People who respond to surveys may be different from people who don't respond to surveys.

(This is a reminder to you to please fill out your course evaluation if you haven't done so already!)

Choosing the Right Procedure

For each of the following research questions, identify which statistical inference procedure would be appropriate. If the research question calls for a hypothesis test, state the appropriate null and alternative hypotheses. If the research question calls for a confidence interval, clearly identify the parameter to be estimated.

a) How many hours does a full-time Cal Poly student spend studying, per week, on average?

Confidence interval for μ = average time spent studying by all full-time Cal Poly students

b) Does a full-time Cal Poly student spend an average of more than 25 hours per week studying?

Hypothesis test for μ = average time spent studying by all full-time Cal Poly students

$$H_0: \mu = 25$$

$$H_A: \mu > 25.$$

c) Does the percentage of full-time Cal Poly students who were born in California differ from 80%?

Hypothesis test for p = proportion of all full-time Cal Poly students who were born in CA

$$H_0: p = 0.80$$

$$H_A: p \neq 0.80$$

d) What proportion of full-time Cal Poly students were born in California?

Confidence interval for p = proportion of all full-time Cal Poly students who were born in CA

e) What proportion of people with a driver's license in California have indicated a willingness to be an organ donor?

Confidence interval for p = proportion of all Californians who have indicated a willingness to be an organ donor.

f) Have more than two-thirds of all people with a driver's license in California indicated a willingness to be an organ donor?

Hypothesis test for p = proportion of all Californians who have indicated a willingness to be an organ donor.

$$H_0: p = 2/3$$

$$H_A: p > 2/3$$

g) What is the price of an average transaction at the Subway on campus?

Confidence interval for μ = average price of all transactions at the Subway on campus

h) What proportion of transactions at the Subway on campus include a soft drink?

Confidence interval for p = proportion of all transactions at Subway that include a soft drink

i) Do most transactions at the Subway on campus include a soft drink?

Hypothesis test for p = proportion of all transactions at Subway that include a soft drink

$$H_0: p = .5$$

$$H_A: p > .5$$

j) Do weekday employees at a company take sick days disproportionately often on Mondays and Fridays?

Hypothesis test for p = proportion of sick days taken on Mondays and Fridays by all employees at the company

$$H_0: p = 2/5 \text{ (Monday and Friday make up 2 out of the 5 weekdays.)}$$

$$H_A: p > 2/5$$