

I'll be back?

In a recent poll (conducted in the second half of October 2005) of California voters, 798 of the 1,450 randomly selected voters said they were unlikely to support Governor Arnold Schwarzenegger for re-election next year. Based on this poll we wish to make inferences on the proportion of all California voters, p , who would be unlikely to support Governor Schwarzenegger for re-election.

1. Test the hypothesis that the proportion of California voters who would be unlikely to support Governor Schwarzenegger for re-election is 0.50 against the alternative that the proportion is greater than 0.50.

Step 1: **$H_0: p = 0.50$**
 $H_a: p > 0.50$

Step 2: Check conditions:
Randomization condition: randomly selected voters.
10% condition: 1,450 is less than 10% of all voters.
Success/Failure condition: $1,450(0.50) = 725 > 10$
 $1,450(1-0.50) = 725 > 10$

Step 3: Compute value of test statistics and P-value:

$$z = \frac{\hat{p} - p_o}{\sqrt{\frac{p_o(1-p_o)}{n}}} = \frac{0.55 - 0.50}{\sqrt{\frac{0.50(1-0.50)}{1450}}} = \frac{0.05}{0.01313} = 3.81$$

$$P\text{-value} = 1 - 0.9999 = 0.0001$$

Step 4: Use P-value to make a decision:
Because the P-value is so small, we should reject the null hypothesis.

Step 5: State a conclusion in the context of the problem:
The proportion of all California voters who would be unlikely to support Governor Schwartzenegger for reelection next year is greater than 50%.

2. Construct a 95% confidence interval for the proportion of all California voters that would be unlikely to support Schwarzenegger for re-election. Using this confidence interval is a majority of California voters unlikely to support Schwarzenegger for re-election?

Conditions are checked above.

$$\hat{p} \pm z^* \sqrt{\frac{\hat{p}(1-\hat{p})}{n}} \Rightarrow 0.55 \pm 2 \sqrt{\frac{0.55(1-0.55)}{1450}} \Rightarrow 0.55 \pm 0.026$$

$$0.524 \text{ to } 0.576$$

All values in the interval are greater than 50%, therefore a majority of voters is unlikely to support Governor Schwartzenegger for reelection next year.