

One-Population Proportion (%) Hypothesis Test

Ex: Test the claim that less than 10% of COC stat students carpool to school.

Sample Data: $X=30$
 $n=332$

$$\hat{p} = \frac{X}{n} = \frac{30}{332} \quad n-X = 302$$

$$\hat{p} \approx 0.09036$$

(Use 5% sig level.)

$$H_0: \pi = 0.1$$

$$H_A: \pi < 0.1 \text{ claim}$$

Left Tailed Test

$$Z\text{-test Stat} = -0.585$$

The sample proportion .09036 is 0.585 standard errors lower than the population proportion 0.1

Hyp. Test Steps

- 1 Claim, H_0 , H_A , Type of test, choose sig. level
- 2 Collect Sample data, Check Assumptions
- 3 Use computer software to calculate test statistic, Critical values, P-value
- 4 Analyze and explain test statistic, P-value, Significance? Sampling Variability?
- 5 Reject H_0 or Fail to reject H_0 ?
- 6 Conclusion

StatKey (Theoretical Distribution Normal)



P-value > sig level
 Fail to reject H_0 .
 Conclusion (High P-value) Claim H_A

There is not significant evidence to support the claim that less than 10% of COC Stat students carpool.

One-Population Proportion Assumptions

- 1 Random Sample or represents pop.
- 2 Individuals within sample independent
- 3 At least 10 success
- 4 At least 10 failures

Z-test Statistic

$$Z = \frac{(\hat{p} - \pi)}{\sqrt{\frac{\pi(1-\pi)}{n}}} = \frac{(.09036 - 0.1)}{\sqrt{\frac{.1(1-.1)}{332}}}$$

of standard errors that the sample proportion \hat{p} is above (+) or below (-) the population proportion π .