

Section 10.4 — Hypothesis Testing for Population Proportions

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Test Statistic

$$z = \frac{\hat{p} - p}{\sqrt{\frac{p(1-p)}{n}}}$$

where

- \hat{p} is the sample proportion,
- p is the population proportion,
- and n is the sample size.

p -values (reminder)

Definition (p -values)

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Determining p -values

Left-tailed	p -value = area to the <i>left</i> of the test statistic
Right-tailed	p -value = area to the <i>right</i> of the test statistic
Two-tailed	p -value = <i>twice</i> the area in the tail beyond the test statistic

Juries

In *Castenada v. Partida*, it was found that during a period of 11 years in Hidalgo County, Texas, 870 people were selected for grand jury duty and 39% of them were Americans of Mexican Ancestry. Among the people eligible for grand jury duty, 79.1% were Americans of Mexican Ancestry. Use a 0.01 significance level to test the claim the selection process is biased against Americans of Mexican ancestry.

Sleep apnea

Sleep apnea is a condition in which sufferers stop breathing momentarily while they are asleep. A current estimate is that approximately 5.8% of Americans suffer from sleep apnea. In a study of commercial truck drivers, 30 out of 350 commercial truck drivers suffered from sleep apnea. Test the claim that the percentage of commercial truck drivers who suffer from sleep apnea is *not* 5.8%.