

Confidence Interval Examples

(All numbers are fictional.)

1. A random sample of 28 customers at a gas station shows an average gas purchase of 8.9 gallons with a standard deviation of 3.2 gallons. Find the 98% confidence interval estimating the population mean number of gallons purchased at this station. Interpret this result.
2. A random sample of 212 high school students in a particular town showed that 56 smoke on a regular basis. Find the 95% confidence interval estimating the population percentage for smokers at this high school.

Suppose the national average for smokers in high schools is 34.2%. Does it appear that the students in this particular town smoke less than the national average? Justify your answer.
3. A random sample of Ohio cemeteries shows that the average age at death of Revolutionary War veterans is 67 years ($n = 28, s = 9$). Another such random sample showed that the average age at death for Civil War veterans who survived the war is 48 years ($n = 77, s = 12$).

Find the 95% confidence interval estimating the population difference between the age at death of these two groups of veterans.
4. A random sample of 423 adult women showed that 64% are currently married. Another sample of 310 adult men showed that 60% are currently married. Find the 95% confidence interval for the difference in the population percentages between women and men.

Does it appear that there could be no difference in the population between the percent of men and women who are married? Justify your conclusion.

Hypothesis Testing Examples

(All numbers are fictional except for problem 3.)

1. A group of 26 patients scored 45.3 on a particular medical test after using an experimental drug, with a standard deviation of 5.8. A control group of patients administered a placebo scored 49.7 on the same test. Set up a hypothesis test to compare the experimental group with the control group. (Write out in plain English, not just symbols.) Perform the hypothesis test and interpret the results.
2. In a survey of 96 Hillsboro residents a total of 14 admitted to being Bengal's fans. Is there enough evidence to conclude that fewer than 20% of Hillsboro residents could be Bengal's fans?
3. Midterm scores for Math 160 in Winter, 2008 averaged 72.4 with a standard deviation of 12.8 (14 students). Midterm scores for Math 160 in Summer, 2008 averaged 83.7 with a standard deviation of 7.9 (also 14 students).
Is there enough evidence to conclude that, if these are representative samples of all Math 160 classes, summer classes perform better than winter classes in Math 160?
- 4.