

Statistics for Business – List 3

Confidence Intervals

1. The owner of Britten's Egg Farm wants to estimate the mean number of eggs laid per chicken. A sample of 40 chickens shows they laid an average of 20 eggs per month with a standard deviation of 2 eggs per month.
 - a. What is the value of the population mean? What is the best estimate of this value?
 - b. Develop the 95 percent confidence interval for the population mean.
 - c. Would it be reasonable to conclude that the population mean is 21 eggs? What about 25 eggs?
2. The American Sugar Producers Association wants to estimate the mean yearly sugar consumption. A sample of 16 people reveals the mean yearly consumption to be 60 pounds with a standard deviation of 20 pounds.
 - a. What is the value of the population mean? What is the best estimate of this value?
 - b. Explain why we need to use the t distribution. What assumption do you need to make?
 - c. Develop the 90 percent confidence interval for the population mean.
 - d. Would it be reasonable to conclude that the population mean is 63 pounds?
3. Merrill Lynch Securities and Health Care Retirement, Inc., are two large employers in down-town Toledo, Ohio. They are considering jointly offering child care for their employees. As a part of the feasibility study, they wish to estimate the mean weekly child-care cost of their employees. A sample of 10 employees who use child care reveals the following amounts spent last week: \$107 \$92 \$97 \$95 \$105 \$101 \$91 \$99 \$95 \$104. Develop a 90 percent confidence interval for the population mean. Interpret the result.
4. The Greater Pittsburgh Area Chamber of Commerce wants to estimate the mean time workers who are employed in the downtown area spend getting to work. A sample of 15 workers reveals the following number of minutes traveled: 29 38 38 33 38 21 45 34 40 37 37 42 30 29 35. Develop a 98 percent confidence interval for the population mean. Interpret the result.
5. The cure rate for a the standard treatment of a disease is 40%. Dr. Smith proposes a new treatment which he claims is better. He says that he has used his new treatment on 50 patients with the disease and cured 24 of them. Is this new treatment better. Use a 95% confidence interval to answer the question.
6. Experimenters injected a growth hormone gene into thousands of carp eggs. Of the 400 carp that grew from these eggs, 20 incorporated the gene into their DNA (Science News, May 20, 1989). Calculate a 95% confidence interval for the proportion of carp that would incorporate the gene into their DNA. From Statistics, S. Rasmussen, CA: Brooks/Cole, 1992.