3. Risky Behavior In a *USA Today* poll of 737 respondents, 92% said that they do not open unfamiliar e-mail and instant-message links. Use a 0.01 significance level to test the claim that more than 75% of us do not open unfamiliar e-mail and instant-message links. How is the validity of the results affected by the knowledge that *USA Today* posted a question on its web site, and 737 people chose to respond?

4. Birth Weight A simple random sample of 1862 births of Chinese babies resulted in a mean birth weight of 3171 g and a standard deviation of 428 g (based on "Comparison of Birth Weight Distributions between Chinese and Caucasian Infants," by Wen et al., *American Journal of Epidemiology,* Vol. 172, No 10). Use a 0.01 significance level to test the claim that the mean birth weight of Chinese babies is less than the mean birth weight of 3369 g for Caucasian babies.

5. Birth Weights A simple random sample of 81 births of Chinese babies resulted in a mean birth weight of 3245 g and a standard deviation of 466 g. Test the claim that the standard deviation of birth weights of Chinese babies is equal to 567 g, which is the standard deviation of birth weights of Caucasian babies. Use a 0.01 significance level and assume that the birth weights are normally distributed.

6. Monitoring Lead in Air Listed below are measured amounts of lead (in micrograms per cubic meter, or $\mu g/m^3$, in the air. The Environmental Protection Agency has established an air quality standard for lead of 1.5 $\mu g/m^3$. The measurements shown below constitute a simple random sample of measurements recorded at Building 5 of the World Trade Center site on different days immediately following the destruction caused by the terrorist attacks of September 11, 2001. After the collapse of the two World Trade Center buildings, there was considerable concern about the quality of the air. Use a 0.05 significance level to test the claim that the sample is from a population with a mean greater than the EPA standard of 1.5 $\mu g/m^3$.

5.40 1.10 0.42 0.73 0.48 1.10

7. Pennsylvania Lottery In the Pennsylvania Match 6 lottery, six numbers between 1 and 49 are randomly drawn. To simulate the number selection process, a TI-83/84 Plus calculator was used to randomly generate 100 numbers between 1 and 49 inclusive. The sample has a mean of 24.2 and a standard deviation of 14.1. Use a 0.01 significance level to test the claim that the sample is selected from a population with a mean equal to 25, which is the mean of the population of all drawn numbers.

8. Type I Error and Type II Error

a. In general, what is a type I error? In general, what is a type II error?

b. For the hypothesis test in Exercise 7, write a statement that would constitute a type I error, and write another statement that would be a type II error.

9. Pennsylvania Lottery and χ^2 Test Assume that we want to use the same sample data from Exercise 7 to test the claim that the standard deviation of all drawn numbers is less than 15.0. Why can't we use a χ^2 test with the methods described in Section 8-4?

10. Tests of Child Booster Seats The National Highway Traffic Safety Administration conducted crash tests of child booster seats for cars. Listed below are results from those tests, with the measurements given in HIC (standard *head injury condition* units). The safety requirement is that the HIC measurement should be less than 1000 HIC. Use a 0.01 significance level to test the claim that the sample is from a population with a mean less than 1000 HIC. Do the results suggest that all of the child booster seats meet the specified requirement?

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