

8.18: Assignment- Hypothesis Testing for the Population Proportion p

The objectives of this activity are:

1. To give you guided practice in carrying out a hypothesis test about a population proportion. (Note: This hypothesis test is also called a z-test for the population proportion.)
2. To learn how to use statistical software to help you carry out the test.

Background: This activity is based on the results of a recent study on the safety of airplane drinking water that was conducted by the U.S. Environmental Protection Agency (EPA). A study found that out of a random sample of 316 airplanes tested, 40 had coliform bacteria in the drinking water drawn from restrooms and kitchens. As a benchmark comparison, in 2003 the EPA found that about 3.5% of the U.S. population have coliform bacteria-infected drinking water. The question of interest is whether, based on the results of this study, we can conclude that drinking water on airplanes is more contaminated than drinking water in general

Question 1:

Let p be the proportion of contaminated drinking water in airplanes. Write down the appropriate null and alternative hypotheses.

Question 2:

Based on the collected data, is it safe to use the z-test for p in this scenario? Explain.

Use the following instructions to conduct the z-test for the population proportion:

Instructions

Click on the link corresponding to your statistical package to see instructions for completing the activity, and then answer the questions below.

[R](#) | [StatCrunch](#) | [Minitab](#) | [Excel](#) | [TI Calculator](#)

Question 3:

Now that we have established that it is safe to use the Z-test for p for our problem, go ahead and carry out the test. Paste the output below.

Question 4:

Note that, according to the output, the test statistic for this test is 8.86. Make sure you understand how this was calculated, and give an interpretation of its value.

Question 5:

We calculated a P-value of 0 in this test. Interpret what that means, and draw your conclusions.

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