

## 7.10 Summary

Number of Groups, Outcome: Parameter	Test Statistic, $n < 30$	Test Statistic, $n \geq 30$
One sample, continuous: $\mu$	$t = \frac{\bar{X} - \mu_0}{s / \sqrt{n}}, df = n - 1$ (Technically assume data is normal.)	$z = \frac{\bar{X} - \mu_0}{s / \sqrt{n}}$
One sample, dichotomous: $p$	Binomial Test (Not taught in this class.)	$z = \frac{\hat{p} - p_0}{\sqrt{\frac{p_0(1-p_0)}{n}}}$
One Sample, Categorical and Ordinal: $p_1, \dots, p_k$	Multinomial Test (Not taught in this class.)	$\chi^2 = \sum \frac{(O - E)^2}{E}, df = k - 1$

**7.11 Practice Problems**

13. A recent recommendation suggests 60 minutes of physical activity per day. A sample of 50 adults in a study of cardiovascular risk factors report exercising a mean of 38 minutes per day with a standard deviation of 19 minutes. Based on the sample data, is the physical activity significantly less than recommended? Run the appropriate test at a 5% level of significance.

Answer:

Step 1. Set up hypotheses and determine level of significance.

Step 2. Select the appropriate test statistic.

Step 3. Set up decision rule:

Step 4. Compute the test statistic.

Step 5. Conclusion.

- \* From Chapter 6 #6. Data are collected in a clinical trial evaluating a new compound designed to improve wound healing in trauma patients. The new compound is compared against a placebo. After treatment for 5 days, with the new compound or placebo, the extent of wound healing is measured and the data are shown in Table 6.25. Suppose that clinicians feel that if the percentage reduction in the size of the wound is greater than 50%, then the treatment is a success.

**TABLE 6.25 Wound Healing by Treatment**

Treatment	Number of Patients with Percent Reduction in Size of Wound				
	None	1–25%	26–50%	51–75%	76–100%
New compound ( $n = 125$ )	4	11	37	32	41
Placebo ( $n = 125$ )	12	24	45	34	10

Perform a hypothesis test to determine if the true percent success in patients receiving the new compound is greater than 0.5.

Step 1. Set up hypotheses and determine level of significance.

Step 2. Select the appropriate test statistic.

Step 3. Set up decision rule.

Step 4. Compute the test statistic.

Step 5. Conclusion.

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2. Use the data in Problem 1 (from the book) and pool the data across the treatments into one sample of size  $n = 250$ . Use the pooled data to test whether the distribution of the percent wound healing is approximately normal. Specifically, use the following distribution: 30%, 40%, 20%, and 10% and  $\alpha = 0.05$  to run the appropriate test.

Answer:

Step 1. Set up hypotheses and determine level of significance.

Step 2. Select the appropriate test statistic.

Step 3. Set up decision rule.

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Step 4.      Compute the test statistic.

Step 5.      Conclusion.