

Hypothesis Testing

Hypothesis testing is used to compare two groups statistically.

Here are the steps involved in hypothesis testing:

1. State the hypotheses.

$$\begin{array}{l}
 H_0: \mu_F = \mu_S \\
 H_A: \mu_F \neq \mu_S
 \end{array}
 \left\{ \begin{array}{l} \mu = \# \\ \mu \neq \# \end{array} \right.
 \left\{ \begin{array}{l} p_F = p_m \\ p_F \neq p_m \end{array} \right.
 \left\{ \begin{array}{l} p = \# \\ p \neq \# \end{array} \right.$$

null hypothesis (points to H_0)
alternate hypothesis (points to H_A)

2. Choose the appropriate test.

z-test \rightarrow Compare the average of a sample
to an outside number
t-test \rightarrow

2-Sample z-test \rightarrow Compare the average of
two samples
2-Sample t-test \rightarrow

1-Proportion z-test \rightarrow compare the proportion of a
sample to an outside number

2-Proportion z-test \rightarrow compare the proportion of
two samples

3. Find and interpret p .

p = the probability that the
null hypothesis is true

4. State your conclusion.

if $p < .05$, reject H_0

if $p > .05$, do not reject H_0

Ex 1 A certain type of pain reliever states that it contains 325 mg of acetaminophen in each ounce of the drug. 70 one-ounce samples are tested for acetaminophen and it is determined that the mean is 319 mg with a standard deviation of 26 mg. Test the claim that the sample mean is 325.

1. State the hypotheses.

$$H_0: \mu = 325$$

2. Choose the appropriate test.

$$H_A: \mu \neq 325$$

z-test

3. Find the p value.

$$p = .054$$

4. State the conclusion.

Do not reject H_0

Ex 2 A vote is to be taken to determine whether casino gambling should be legalized. To determine if there is a significant difference in the proportion of urban and rural voters favoring the proposal, a poll is taken. If 123 of 210 urban voters favor the legalization, and 244 of 515 rural voters favor it, is there a significant difference in the proportions?

1. State the hypotheses. $H_0: P_U = P_R$
2. Choose the appropriate test. $H_A: P_U \neq P_R$
2-prop. z-test
3. Find the p value. $p = .006$
4. State the conclusion. Reject H_0

Homework
p.191 #1-6
Due Tuesday, April 30