

SNSCOLLEGEOFTECHNOLOGY



(AnAutonomousInstitution) Coimbatore-641035.

UNIT-III Testing of Hypothesis

Large samples

Test for sufference of proportions

NULL Hypothesis
$$H_0: P_1 = P_2$$

Test Statistics: $Z = P_1' - P_2'$
 $\sqrt{P_7} \times \left[\frac{1}{n_1} + \frac{1}{n_2}\right]$

where $P_i' = \frac{\alpha_1}{n_1}$; $P_2' = \frac{\alpha_2}{n_2}$
 $P = \frac{\alpha_1 + \alpha_2}{n_1 + n_2}$ and $P = 1 - P$

Random samples of 400 men and 600 comen were asked whether they would have a favour near their residence too men and 325 women were in law of the proportion. Test the hypothesis that proportion of men and women in favour of the proportion same against that they are not at 5% level.

Solution:

$$n_{1} = 400 \qquad n_{2} = 600$$

$$x_{1} = 200 \qquad x_{3} = 325$$

$$P_{1}' = \frac{x_{1}}{n_{1}} = \frac{200}{400} = 0.5$$

$$P_{2}' = \frac{x_{2}}{n_{3}} = \frac{325}{600} = 0.54$$

$$P = \frac{x_{1} + x_{2}}{n_{1} + n_{2}} = \frac{200 + 325}{400 + 60} = \frac{525}{1000} = 0.525$$



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$$q_{1} = 1 - p = 1 - 0.5 25 = 0.475$$
Step 1: Fournulate H₀ and H₁

$$H_{0} : P_{1} = P_{2}$$

$$H_{1} : P_{1} \neq P_{2} \quad [\text{Two tail}]$$
Step 2: Level of significance
$$\alpha = 0.05$$
Step 3: Test Statistics
$$Z = P_{1}' - P_{2}'$$

$$\sqrt{P_{1}} \frac{1}{n_{1}} + \frac{1}{n_{2}}$$

$$= 0.5 - 0.54$$

$$\sqrt{0.525}(0.475) \times \sqrt{1000}$$

$$= -0.04$$

$$\sqrt{0.249}(0.005 + 0.0016)$$

$$= -0.04$$

$$\sqrt{0.249}(0.004) = -0.04$$

$$\sqrt{0.031}$$

$$= 1.29$$
Step 4: Critical value
$$Z_{2} = 1.96$$



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$$q = 1 - p = 1 - 0.525 = 0.475$$

$$Step 1 : Fournulate H_0 and H_1$$

$$H_0 : P_1 = P_2$$

$$H_1 : P_1 \neq P_2 \quad [Two tail]$$

$$Step 2 : Level of significance$$

$$\alpha = 0.05$$

$$Step 3 : Test Statistics$$

$$Z = P_1' - P_2'$$

$$\sqrt{P_1 \left(\frac{1}{P_1} + \frac{1}{P_2}\right)}$$

$$= 0.5 - 0.54$$

$$\sqrt{0.525}(0.475) \times \left(\frac{1}{100} + \frac{1}{100}\right)$$

$$= -0.04$$

$$\sqrt{0.249} \left(0.004\right) = -0.04$$

$$\sqrt{0.249} \left(0.004\right) = -0.04$$

$$= 1.29$$

$$Z = 1.29$$

$$Step 4 : Cuitical value$$

$$Z_2 = 1.96$$

Step 5: conclusion
$$|Z| = 1.29 \times 1.96 = |Z_X|$$

$$\therefore H_0 \text{ is accepted}$$