

Chapter 4 Conclusion

Estimation of the Mean μ

- σ known

$$\mu \in \left[\bar{x} \pm \frac{\sigma}{\sqrt{n}} Z_{1-\frac{\alpha}{2}} \right]$$

- σ unknown and $n > 30$

$$\mu \in \left[\bar{x} \pm \frac{s}{\sqrt{n}} Z_{1-\frac{\alpha}{2}} \right]$$

- σ unknown and $n < 30$

$$\mu \in \left[\bar{x} \pm \frac{s}{\sqrt{n}} T_{(n-1, 1-\frac{\alpha}{2})} \right]$$

Estimation of the difference

between two Means $\mu_1 - \mu_2$

- σ_1^2 and σ_2^2 knowns

$$\mu_1 - \mu_2 \in \left[(\bar{x} - \bar{y}) \pm \sqrt{\frac{\sigma_1^2}{n_1} + \frac{\sigma_2^2}{n_2}} Z_{1-\frac{\alpha}{2}} \right]$$

- σ_1^2 and σ_2^2 unknowns and $n_1, n_2 > 30$

$$\mu_1 - \mu_2 \in \left[(\bar{x} - \bar{y}) \pm \sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}} Z_{1-\frac{\alpha}{2}} \right]$$

- σ_1^2 and σ_2^2 unknowns and $n_1, n_2 < 30$

$$S_p^2 = \frac{(n_1 - 1)s_1^2 + (n_2 - 1)s_2^2}{n_1 + n_2 - 2}$$

$$\mu_1 - \mu_2 \in \left[(\bar{x} - \bar{y}) \pm S_p \sqrt{\frac{1}{n_1} + \frac{1}{n_2}} T_{(n_1 + n_2 - 2, 1-\frac{\alpha}{2})} \right]$$

Estimation Proportion P

$$P \in \left[\hat{P} \pm \sqrt{\frac{\hat{P}\hat{Q}}{n}} Z_{1-\frac{\alpha}{2}} \right]$$

Estimation of the difference between two Proportions

$$P_1 - P_2$$

$$P \in \left[(\hat{P}_1 - \hat{P}_2) \pm \sqrt{\frac{\hat{P}_1\hat{Q}_1}{n_1} + \frac{\hat{P}_2\hat{Q}_2}{n_2}} Z_{1-\frac{\alpha}{2}} \right]$$

Estimation of σ^2

$$\frac{(n-1)S^2}{\chi^2_{1-\frac{\alpha}{2}}} \leq \sigma^2 \leq \frac{(n-1)S^2}{\chi^2_{\frac{\alpha}{2}}}$$

Estimation of σ

$$\sqrt{\frac{(n-1)S^2}{\chi^2_{1-\frac{\alpha}{2}}}} \leq \sigma \leq \sqrt{\frac{(n-1)S^2}{\chi^2_{\frac{\alpha}{2}}}}$$