

## Polla de Bioestadística II

Media

$$\mu = \frac{1}{N} \sum_{i=1}^N x_i$$

Varianza poblacional

$$\sigma^2 = \frac{\sum (x_i - \mu)^2}{N}$$

Varianza muestral

$$s^2 = \frac{\sum (x_i - \bar{x})^2}{n-1}$$

Probabilidad

$$P(E) = \frac{n}{N}$$

Tipificar x a Z

$$Z = \frac{x - \mu}{\sigma}$$

Distribución derivada

$$\mu_x = \mu \quad \sigma^2_x = \sigma^2/n$$

Error media Muestreo totalmente aleatorio

$$E = Z_{(\frac{\alpha}{2})} \cdot \frac{\sigma}{\sqrt{n}}$$

Error Varianza Muestreo totalmente aleatorio

$$\frac{(n-1)s^2}{\chi^2_{(\alpha/2)}} < \sigma^2 < \frac{(n-1)s^2}{\chi^2_{(1-\alpha/2)}}$$

Error proporciones muestreo totalmente aleatorio

$$Z_{\alpha/2} \sqrt{\frac{\frac{x}{n}(1-\frac{x}{n})}{n-1} \left( \frac{N-n}{N} \right)}$$

Tamaño muestra estimación media muestreo totalmente aleatorio

$$n = \left[ \frac{Z_{(\frac{\alpha}{2})} \sigma}{\Delta} \right]^2$$

Tamaño muestra estimación proporción muestreo totalmente aleatorio

$$n = \frac{N(p)(1-p)}{(N-1)\Delta - p(1-p)}$$

### Pruebas Hipótesis

Una media con varianza conocida

$$Z = \frac{\bar{x} - \mu}{\sigma / \sqrt{n}}$$

$$H_0 = \mu_0 = \mu$$

$$H_1 = \mu_0 \neq \mu$$

$$W = |Z| \geq Z_{(\alpha/2)}$$

$$H_0 = \mu_0 = \mu$$

$$H_1 = \mu_0 < \mu$$

$$W = \{Z \leq -Z_{(\alpha)}\}$$

$$H_0 = \mu_0 = \mu$$

$$H_1 = \mu_0 > \mu$$

$$W = \{Z \geq Z_{(\alpha)}\}$$

Una media con varianza desconocida

$$t = \frac{\bar{x} - \mu}{s / \sqrt{n}} \quad v=n-1$$

$$H_0 = m_0 = \mu$$

$$H_1 = m_0 \neq \mu$$

$$W = |t| \geq t_{(\alpha/2)}$$

$$H_0 = \mu_0 = \mu$$

$$H_1 = \mu_0 < \mu$$

$$W = \{t < -t_{(\alpha)}\}$$

$$H_0 = \mu_0 = \mu$$

$$H_1 = \mu_0 > \mu$$

$$W = \{t \geq t_{\alpha}\}$$

Una varianza.-

$$\chi^2 = \frac{(n-1)s^2}{\sigma^2}$$

$$v=n-1$$

$$H_0 = \sigma^2_0 = \sigma^2$$

$$H_1 = \sigma^2_0 \neq \sigma^2$$

$$W = \chi^2_{(\alpha/2)} \leq \chi^2 \leq \chi^2_{(1-\alpha/2)}$$

$$H_0 = \sigma^2_0 = \sigma^2$$

$$H_1 = \sigma^2_0 < \sigma^2$$

$$W = \{\chi^2 \geq \chi^2_{(1-\alpha)}\}$$

$$H_0 = \sigma^2_0 = \sigma^2$$

$$H_1 = \sigma^2_0 > \sigma^2$$

$$W = \{\chi^2 \leq \chi^2_{\alpha}\}$$

Una proporción.-

$$Z = \frac{p_o - p}{\sqrt{\frac{pq}{n}}}$$

$$H_0: p_0 = p$$

$$H_1: p_0 \neq p$$

$$W = |Z| > Z_{(\alpha/2)}$$

$$H_0 = p_0 = p$$

$$H_1 = p_0 < p$$

$$W = \{Z < -Z_{(\alpha)}\}$$

$$H_0 = p_0 = p$$

$$H_1 = p_0 > p$$

$$W = \{Z > Z_{(\alpha)}\}$$

Dos Varianzas.-

$$F = \frac{s^2_1}{s^2_2} \quad v_1=n_1-1 \text{ y } v_2=n_2-1$$

$$H_0 = \sigma^2_1 = \sigma^2_2$$

$$H_1 = \sigma^2_1 \neq \sigma^2_2$$

$$W = F > F_{(\alpha/2)}$$

$$H_0 = \sigma_1^2 = \sigma_2^2$$

$$H_1 = \sigma_1^2 > \sigma_2^2 \quad W = \{F \geq F_{(\alpha)}\}$$

Medias, varianzas conocidas.-

$$Z = \frac{(\bar{x}_1 - \bar{x}_2)}{\sqrt{\frac{\sigma_1^2}{n_1} + \frac{\sigma_2^2}{n_2}}}$$

$$H_0 = \mu_1 = \mu_2$$

$$H_1 = \mu_1 \neq \mu_2 \quad w = |Z| \geq Z_{(\alpha/2)}$$

$$H_0 = \mu_1 = \mu_2$$

$$H_1 = \mu_1 > \mu_2 \quad W = \{Z \geq Z_{(\alpha)}\}$$

Medias, Varianzas desconocidas e iguales.-

$$t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{(n_1-1)s_1^2 + (n_2-1)s_2^2}{n_1+n_2-2} \times \left(\frac{1}{n_1} + \frac{1}{n_2}\right)}} \quad v=n-1$$

$$H_0 = \mu_1 = \mu_2$$

$$H_1 = \mu_1 \neq \mu_2 \quad w = |t| \geq t_{(\alpha/2)}$$

$$H_0 = \mu_1 = \mu_2$$

$$H_1 = \mu_1 > \mu_2 \quad W = \{t \geq t_{(\alpha)}\}$$

Dos proporciones independientes.-

$$Z = \frac{p_1 - p_2}{\sqrt{pq\left(\frac{1}{n_1} + \frac{1}{n_2}\right)}}$$

$$H_0 = p_1 = p_2$$

$$H_1 = p_1 \neq p_2 \quad W = |Z| \geq Z_{(\alpha/2)}$$

$$H_0 = p_1 = p_2$$

$$H_1 = p_1 > p_2 \quad W = \{Z \geq Z_{(\alpha)}\}$$

Tablas de contingencia

$$np_{ij} = \frac{n_i \cdot n_j}{N} \quad \text{o determinar probabilidad para}$$

el rango

$$\chi^2 = \sum_{i=1}^s \sum_{j=1}^r \frac{(n_{ij} - np_{ij})^2}{np_{ij}} \quad v=(r-1)(s-1)$$

$$W = \{\chi^2 > \chi^2_{(\alpha)}\}$$