

Estimating Population Proportion:

Interval Estimation:

$$\left(p - z_{\alpha/2} \times \sqrt{\frac{\pi(1-\pi)}{n}}, p + z_{\alpha/2} \times \sqrt{\frac{\pi(1-\pi)}{n}} \right)$$

~ π is unknown.

~ Replacement w/ unbiased estimate p .

$$\left(p - z_{\alpha/2} \times \sqrt{\frac{p(1-p)}{n}}, p + z_{\alpha/2} \times \sqrt{\frac{p(1-p)}{n}} \right)$$

$$\hookrightarrow n \geq 30$$

$$\hookrightarrow n\pi \geq 5$$

$$\hookrightarrow n(1-\pi) \geq 5$$

$$\Rightarrow p = \frac{25}{100} = \frac{1}{4} = 0.25$$

$$\left(p - z_{\alpha/2} \times \sqrt{\frac{p(1-p)}{n}}, p + z_{\alpha/2} \times \sqrt{\frac{p(1-p)}{n}} \right)$$

$$\left(0.25 - 1.96 \times \sqrt{\frac{0.25(0.75)}{n}}, 0.25 + 1.96 \times \sqrt{\frac{0.25(0.75)}{n}} \right)$$

$$\left(0.25 - 1.96 \times \sqrt{\frac{0.25(0.75)}{100}} , 0.25 + 1.96 \times \sqrt{\frac{0.25(0.75)}{100}} \right)$$

$$(0.1651 , 0.3348)$$