

Lecture 19

Rough

Work

①

$$\bar{x} = 90.1$$

$$n = 50, 70, 85$$

$$\sigma = 15.6$$

90%

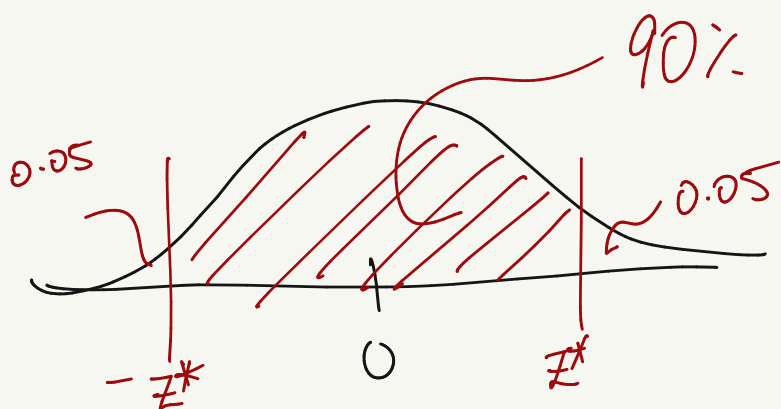
CI for μ :

$$\bar{x} \pm z^* \cdot SE$$

1.645

$$\therefore SE = \frac{\sigma}{\sqrt{n}} \text{ or } \frac{s}{\sqrt{n}}$$

(a) $n=50$: $\bar{x} \pm z^* \frac{15.6}{\sqrt{n}}$



$$q_{\text{norm}}(0.05) = -z^*$$

$$q_{\text{norm}}(0.95) = z^*$$

$$(1-\alpha) + \frac{\alpha}{2}$$

$$q_{\text{norm}}(0.05, \text{lower.tail}=\text{FALSE})$$

$$(a) \quad 90.1 \pm 1.645 \cdot \frac{15.6}{\sqrt{50}}$$

$$(b) \quad 90.1 \pm 1.645 \cdot \frac{15.6}{\sqrt{70}}$$

$$(c) \quad 90.1 \pm 1.645 \cdot \frac{15.6}{\sqrt{85}}$$

5

$$\mu, \sigma^2 = 0.1$$

$$\text{Advertise: } \mu = 1.5$$

$$\text{SRS } n=10, \bar{x} = 1.55$$

$$\alpha = 0.05$$

$$(i) H_0: \mu = 1.5 \text{ mg} \quad \text{OR} \quad \mu \leq 1.5 \text{ mg}$$

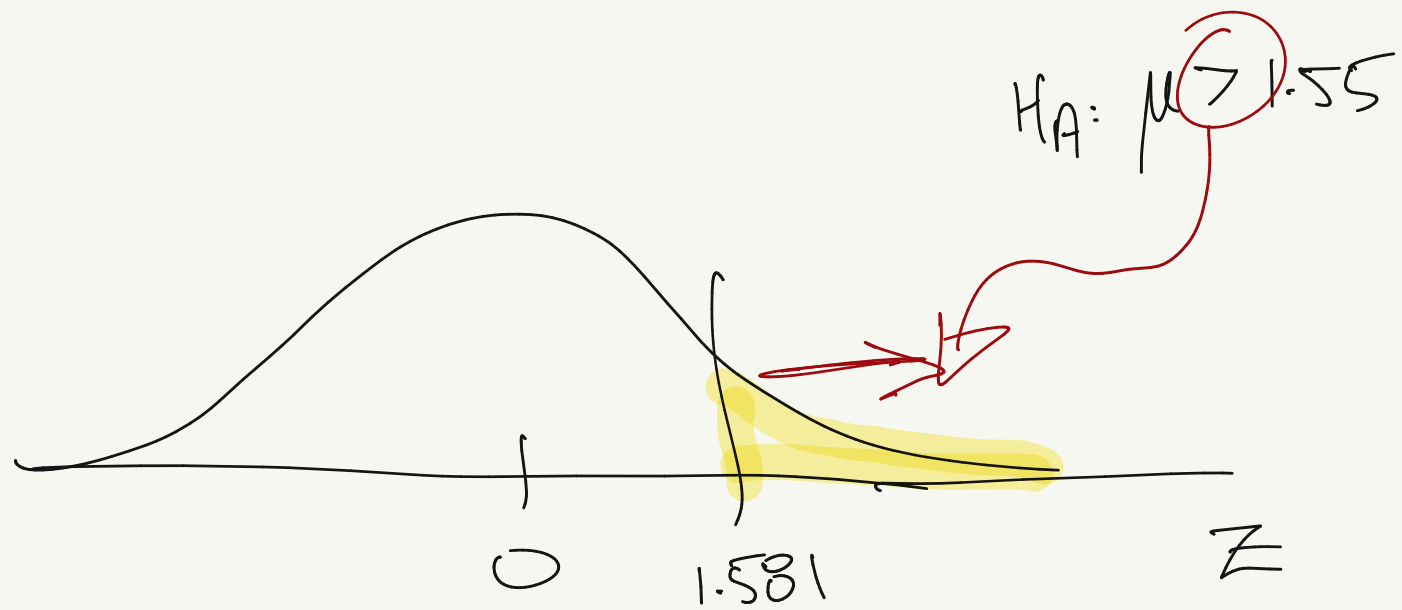
$$H_A: \mu > 1.5 \text{ mg}$$

$$(ii) \text{SRS} \Rightarrow \text{indep.}$$

"normally distributed" \Rightarrow Z is OK

$$(iii) Z_{\text{test}} = \frac{\bar{x} - \mu}{SE} = \frac{1.55 - 1.50}{(0.1/\sqrt{10})} = \underline{\underline{1.581}}$$

$$\therefore SE = \frac{\sigma}{\sqrt{n}}$$



p-val: $\text{pnorm}(1.581, \text{lower-tail} = \text{FALSE})$

\therefore since $0.058 > 0.05$, we do not have evidence at the 95% (or at the 0.05 level) to reject the null; we cannot disprove the company's claim that $\mu = 1.5$.