

Statistics of interest  $\rightarrow$  estimating  $\mu$

point estimates  $\bar{x}$

interval estimates

A 95% Confidence Interval for  $\mu$

is  $\bar{x} \pm \overset{\pm 1.96}{\downarrow} z_{\alpha/2} \cdot se(\bar{x})$

margin of error

$\sigma/\sqrt{n}$

CLT if  $X \sim \overset{\text{mean}}{\mu}, \overset{\text{var}}{\sigma^2}$

as  $n \rightarrow \infty$   $\bar{x} \sim N\left(\mu, \frac{\sigma^2}{n}\right)$

## hypothesis testing

$$H_0 : \mu = \mu_0$$

$$H_A : \mu \neq \mu_0$$

Test statistic

$$Z = \frac{\bar{x} - \mu_0}{\text{se}(\bar{x})} \leftarrow \frac{\sigma}{\sqrt{n}}$$

under CLT  $\sim Z$ 