height → $X = (x_1, \ldots, x_{50})$ → Sample mean: $\bar{X}$

→ for this sample we can get the value of $\bar{X}$

$\bar{X} = 1.65\ m$

→ another sample, $n = 50$, from same pop → $\bar{X} = 1.64\ m$

→ the value of $\bar{X}$ changes from sample to sample.

$\bar{X}$ → variable → has distn, has mean, has var.

$\sqrt{\text{variance of } \bar{X}}$ → S.d or S. error of $\bar{X}$

$$Var(\bar{X}) = \frac{\sigma^2}{n}$$

$$SE(\bar{X}) = \sqrt{\frac{\sigma^2}{n}} = \sigma/\sqrt{n} \approx \frac{SD(\text{of sample})}{\sqrt{n}}$$

sample: $X = (1, 5, 2.5, 10) \Rightarrow n = 4$

$\sqrt{Var(X)}$

S.E of $(\bar{X})$ is $\frac{\sqrt{Var(x)}}{\sqrt{4}}$