

# Introduction to one-population confidence intervals

Population Parameter? (Mean Proportion)

- Unbiased census
- Center of sampling distribution

Sampling Variability  
 Random samples will usually be different than each other and different than the population parameter.

Point Estimate  
 Someone uses a sample statistic as the estimate of the population parameter.

One random Sample? (Statistic)

↓  
 Create a Confidence Interval!

Def: Confidence Interval

Two numbers we think a population parameter might be in between.

$$\text{Sample Statistic} \pm \text{Margin of Error}$$

Confidence Levels  
 (Degree of Confidence)

90%, 95%, 99%  
 ↑  
 most common

Def: Margin of Error

How far off we think a sample statistic could be from the population parameter

Example: Human Body Temp °F

$$\text{Sample Mean } \bar{x} \pm \text{Margin of Error} \quad (95\% \text{ Conf. Level})$$

$$98.260 \pm 0.218 \quad \text{°F} \quad \text{°F}$$

$$(98.260 - 0.218, 98.260 + 0.218)$$

$$(98.042, 98.478)$$

↑  
 Lower Limit

↑  
 Upper Limit

$$98.042 \text{ °F} < \mu < 98.478 \text{ °F}$$

"We are 95% confident that the population mean average human body temperature is between 98.042°F and 98.478°F."