V18 - Estimation - Part 1

- What is a parameter?
- Classical method of estimation
- Interval estimation

Course: Statistical Testing & Regression
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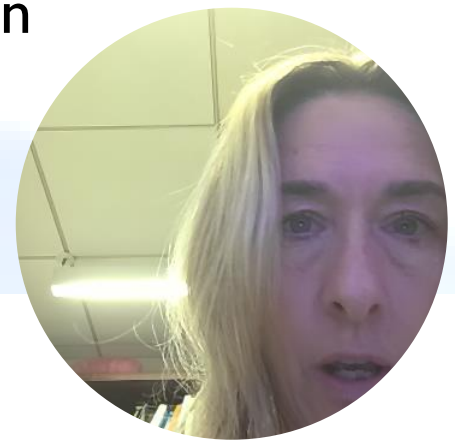


What is a Parameter?

- **Parameter** is number that characterizes a population
  - μ, σ^2, σ
- Statistic (aka descriptive statistic) is number computed from a **sample**
  - $\bar{x}$, s^2
- Parameter is typically unknown, so we estimate it using inference.

Estimation

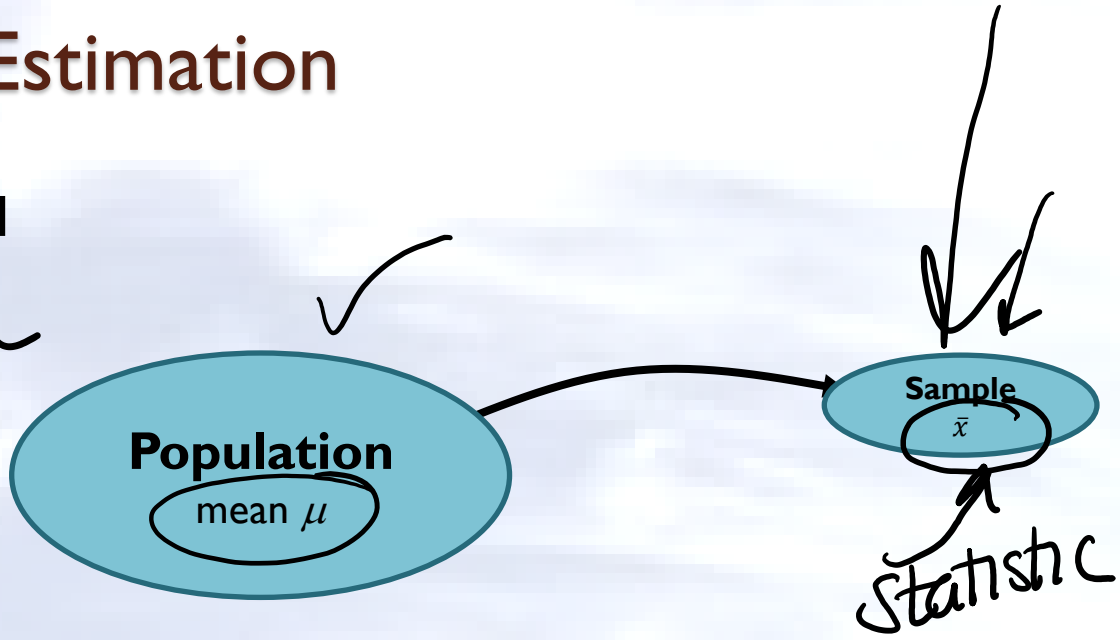
- Form of statistical inference

- ***Estimation* of** various **parameters**
  - mean (single population) μ
  - difference between two means (two populations) $\mu_1 - \mu_2$
  - proportion (single population) p
  - difference between two proportions (two populations) $p_1 - p_2$
  - variance (single population) σ^2
  - ratio of variances (two populations) $\frac{\sigma_1^2}{\sigma_2^2}$

- Will be applying…
  - Sampling distribution theory, including CLT

Classical Method of Estimation

- A **statistic is calculated** from **a** sample **taken from** the population.



- **Point Estimate**
  - Single value calculated from sample
  - Single number that **sensibly** estimates population parameter
  - $\bar{x}$ is **point estimate** of μ
- **Error** expected between parameter and point estimate
  - Point estimate based on only one sample
  - Vary sample to sample

Interval Estimate

- Thus, point estimate unlikely to equal parameter exactly
- Preferable to calculate interval estimate for parameter
  - Range: μ between 12.1 and 12.9
  - More informative
- Serves as the basis for confidence intervals.

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