
Introduction to Inference

Estimating with Confidence

Section 6.1

General approach to inference

Probability calculations help distinguish patterns seen in data between those that are due to chance and those that reflect a real feature of the phenomenon under study

Example: Weights of brown eggs is $N(65, 5)$ grams

Select (by SRS) a dozen white eggs. Suppose $\bar{x} = 64.2$

How do white eggs compare to brown eggs?

Treat as known
(more later)

Note: The setup has population distribution $N(\mu, \sigma = 5)$, hence \bar{x} is $N(\mu, \sigma_{\bar{x}} = 1.44)$

$\sigma/\sqrt{n} = 5/\sqrt{12}$

Target of inference
(mean white egg weight)

Types of inference

- A **confidence interval (CI)** supplements an estimate of a parameter with an indication of its variability
- A **significance test** assesses the truth of a hypothesis about a parameter by comparing it with observed data
- Both work by reporting probabilities that describe what would happen “in the long run,” if the experiment was repeated many, many times