

Section 8.1 Intro to Hypothesis Testing

We just picked 8 cards at random from a deck of 52. 0 were red.

Hypothesis: what you assumed about the population proportion of red cards:

$$p = .50$$

Null hypothesis,
(what you assume to be true)

Alternative Hypothesis: what you expect might be true

$$p < .50 \leftarrow \text{less than } \frac{1}{2} \text{ of the cards are red.}$$

From a random sample of 8 cards, 0 were red.

Summary $\frac{0}{8} = 0\%$ are red.
 $\leftarrow$ sample proportion.

If $\frac{1}{2}$ of the cards are red, the probability of 0 red cards is

$$P(0 \text{ red}) = P(B \frac{1}{2} B \frac{1}{2} B \frac{1}{2} B \frac{1}{2} B \frac{1}{2} B \frac{1}{2} B) \\ = \frac{1}{2} \cdot \frac{1}{2} \cdot \frac{1}{2} \cdot \frac{1}{2} \cdot \frac{1}{2} \cdot \frac{1}{2} \cdot \frac{1}{2} \cdot \frac{1}{2} = \frac{1}{256} \approx 0.0039$$

$\rightarrow$ p-value = likelihood of this occurring.

TO MAKE A CONCLUSION.

If $\frac{1}{2}$ the cards are red, then what happened is almost impossible. I conclude less than $\frac{1}{2}$ are red.

Make a hypothesis & think about its alternative.

GATHER DATA

Analyze Data

Use probability