

Fact Sheet – Appropriate Sample Size for Estimating p or μ (9.1/9.2)

In this section we learn to determine how large of a sample is necessary to construct a confidence interval that meets certain criteria, including level of confidence and margin of error.

Example: I want to estimate the percentage of community college students who are female. How large of a sample must I take in order to be 95% confident that the sample proportion is within 5% of the true percentage?

Example: A researcher wants to estimate the mean height of 24-month-old boys. How large of a sample must she take in order to be 90% sure that her sample mean is within 0.2 inches of the population mean if the standard deviation is 1.8 inches?

Formulas

Proportion

$$n = \left(\frac{z}{E} \right)^2 \cdot p(1-p)$$

Mean

$$n = \left(\frac{z \cdot \sigma}{E} \right)^2$$

Information Needed

Proportion: Level of Confidence, Margin of Error, Estimate of Proportion

Mean: Level of Confidence, Margin of Error, Estimate of Standard Deviation

StatCrunch Steps

Proportion

- Stat > Proportions > One Sample > power/sample size
- Click on “Confidence Interval Width” tab.
- Enter Confidence Level and Target Proportion (use 0.5 if unknown).
- Enter the Width, which is double the margin of error E . Press Compute to find sample size.

Mean

- Stat > t-Statistics > One Sample > power/sample size
- Click on “Confidence Interval Width” tab.
- Enter Confidence Level and Standard Deviation.
- Enter the Width, which is double the margin of error E . Press Compute to find sample size.