Confidence level and interpretation

6 questions | 12 marks

Equivalent correct methods earn the corresponding marks.

1. Correct: “95% of residents have support rates between 0.52 and 0.60.” [2 marks]

A population proportion is one aggregate parameter, not a personal support rate.

Answer: We are 95% confident that the population support proportion is between 0.52 and 0.60.

2. A 95% procedure is used 400 times independently. Find expected misses. [2 marks]

$400 \times 0.05 = 20.$

Answer: $20.$

3. Why can the realised count of misses differ from its expected count? [2 marks]

An expectation is an average over repetitions.

Answer: Repeated sample outcomes vary randomly.

4. Can a correctly calculated 95% interval miss the true mean? [2 marks]

The procedure misses in about 5% of repetitions under its model.

Answer: Yes.

5. Explain the precision trade-off when confidence rises from 90% to 99%. [2 marks]

The standard error stays fixed while the critical value increases.

Answer: The wider interval is less precise but has greater long-run coverage.

6. Why is a confidence interval for a mean not a prediction interval for one new measurement? [2 marks]

Mean uncertainty uses standard error, not the full individual spread.

Answer: Individual measurements vary more than sample means and need a different uncertainty model.