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Data Collection

- Statistical inference: the problem of determining the behaviour of a large population by studying a small sample from that population

If we have a population:

- Parameters – true values for centre and spread
- Exact answers

If we have a sample:

- Statistics – values that estimate the parameters
- Use inferences to make estimations

Statistical inference: the process of making an estimate, prediction or decision about a population, based on a sample

- Census: a study of all elements of a population
- Sample: a subgroup of the population selected for study
 - Sample characteristics = statistics
 - Make inferences about population parameters
 - Make inferences using estimation procedures and hypothesis tests

Errors

- Sampling Error: difference between a population and a sample due to sample selection. Larger samples reduce this error
- Non – Sampling Error: errors other than sampling. Large samples will not reduce these errors

Coverage error:

- Results from selection bias
- Reduced with adequate sampling frame

Non-response error:

- Results in non response bias – assumption that respondents and non respondents are the same

Sampling error:

- Variation, chance differences, margin of error
- Reduced by taking a larger sample

Measurement error:

- *Ambiguous wording of questions*
- *Hawthorne effect*
 - Respondent feels the need to please interviewer
- *Respondent error*
 - Screen responses and contact unusual answers
 - Retesting for reliability of answers

Ethical Issues

Coverage Error:

- Particular groups purposely excluded

Non – response Error:

- Design for certain groups less likely to respond

Sampling Error:

- Findings represented without referencing survey size or margin of error

Measurement Error:

- Leading questions; Hawthorne effect; providing false information

Sampling Plans

Define the Sample Frame

- List of all items that make up a population; sample chosen from frame

Non-probability or Probability Sampling

- Non- probability sampling
 - Choose items included without knowing their probabilities of selection.
 - Statistical inference developed for probability sampling can't be used.
- Probability sampling
 - Select item based on known probabilities
 - Can make statistical inference based on result

Convenience Sampling (Accidental)

- Simply survey those available based on ease and accessibility

Judgmental Sampling (Expert)

- Elicit the views of experts who have specific knowledge in a given area.

Quota Sampling

- Non random selection based on a fixed quota (proportional or non)

Snowball Sampling

- Find one who meets selection criteria
- They then refer to someone else who meets the criteria

Simple Random Sampling

- Every possible sample has an equal chance of being selected