Table of Contents

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