

3.2 Collect and Analyse Data

A Survey

- ✓ A survey is a research method used for collecting data from a predefined group of respondents to gain information and insights into various topics of interest.

Common types of sample surveys:

- ✓ mail surveys
- ✓ telephone surveys
- ✓ personal interview surveys
- ✓ online surveys

Questionnaire

- ✓ most used tool in survey research
- ✓ a series of questions for the purpose of gathering information from respondents

B Data Sources

Primary Source

- ✓ a person who collects data for their own use

Secondary Source

- ✓ database or research collected by someone else

Examples of secondary sources:

- ✓ Internet data
- ✓ Statistics Canada

C Bias

- ✓ any factor that favours certain outcomes or responses
- ✓ systematically skews the survey results
- ✓ may intentional or non-intentional

Sampling Bias

- ✓ occurs when the sampling frame does not reflect the characteristics of the population

Example 1. An aid agency in a developing country wants to know what proportion of households have at least one personal computer. One of the agency's staff members conducts a survey by calling households randomly selected from the telephone directory.

Identify the bias in this survey.

Households having a telephone are more probably to have a computer.

Non-response Bias

- ✓ occurs when particular groups are under-represented in a survey because they choose not to participate
- ✓ non-response bias is a form of sampling bias

Example 2. ~~A science class~~ asks every fifth student entering the cafeteria to answer a survey on environmental issues. Less than half agree to complete the questionnaire. The completed questionnaires show that a high proportion of the respondents are concerned about the environment and well-informed about environmental issues.

What bias could affect these results?

No feedback is collected from more than 50% of all students

Measurement Bias

- ✓ occurs when the data-collection method consistently either under- or overestimates a characteristic of the population

Example 3. A highway engineer suggests that an economical way to survey traffic speeds on an expressway would be to have the police officers who patrol the highway record the speed of the traffic around them every half hour. Identify the bias.

Drivers are following highway rules more when they see police cars.

Response Bias

- ✓ occurs when participants in a survey deliberately give false or misleading answers

Example 4. A teacher has just explained a particularly difficult concept to her class and wants to check that all the students have grasped this concept. Teacher asked: "Do you understand this part?"

Identify the bias.

No feedback from many students.

Example 5. Classify the bias in each of the following scenarios.

a) Members of a golf and country club are polled regarding the construction of a highway interchange on part of their golf course.

Response Bias (Members may mislead you)
Sampling Bias (Everyone should have a say)

b) A group of city councillors are asked whether they have ever taken part in an illegal protest.

Response Bias (they may hide some participations)

c) A random poll asks the following question: "The proposed casino will produce a number of jobs and economic activity in and around your city, and it will also generate revenue for the provincial government. Are you in favour of this forward-thinking initiative?"

The question is misleading

d) A survey uses a cluster sample of Toronto residents to determine public opinion on whether the provincial government should increase funding for the public transit.

Sampling Bias
(Everyone in the province should have a say about provincial money not only people of Toronto)