

## 3.4 Potential Problems with Sampling

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Name: \_\_\_\_\_ Class: \_\_\_\_\_ Date: \_\_\_\_\_

Total: 8 marks

**KEY WORDS** undercoverage 覆盖不足 • response bias 应答偏差 • voluntary response 自愿应答  
• question wording bias 问题措辞偏差 • nonresponse 无应答

### Objective

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Build the skills to answer exam questions on **potential problems with sampling**.

You must be able to:

- identify **undercoverage** 覆盖不足 and **voluntary response** 自愿应答 as sources of bias
- describe how **nonresponse** 无应答 and **response bias** 应答偏差 distort results
- explain how poorly worded questions produce **question wording bias** 问题措辞偏差

### 1 Worked examples

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Study these first. Each one shows the method for a question type used later.

#### ■ Sources of sampling bias

- **Undercoverage** — part of the population is left out.
- **Voluntary response** — only those who choose to reply are counted (often the strongly opinionated).
- **Nonresponse** — selected people cannot be reached or refuse.
- **Response bias** — people give untrue answers (e.g. on sensitive topics).
- **Question wording bias** — a leading question pushes people toward an answer.

#### ■ Spotting the bias

An online poll on a news site asks readers to click “agree” or “disagree.” This has **voluntary response** (only motivated readers click) and **undercoverage** (only that site’s visitors, not the whole population). Name the type from *who is left out* or *why the answers are distorted*.

## 2 Practice

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**2.1** Define undercoverage. [1]

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**2.2** Define nonresponse bias. [1]

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**2.3** State one source of bias that comes from how a question is asked. [1]

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## 3 Exam-style questions

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**3.1** A survey in which people choose whether to respond suffers from [1]

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|---|---|
| A | B |
| C | D |
- A** undercoverage
  - B** voluntary response bias
  - C** randomization
  - D** replication

**3.2** When selected people cannot be reached or refuse to answer, it is [1]

- |   |   |
|---|---|
| A | B |
| C | D |
- A** nonresponse
  - B** a placebo
  - C** blocking
  - D** an SRS

**3.3** A survey uses a leading question that pushes people toward one answer.

(a) Name this type of bias. [1]

(b) Name a bias caused by leaving out part of the population. [1]

(c) Name a bias when only volunteers reply. [1]