

3.4 Potential Problems with Sampling

Name: _____ Class: _____ Date: _____

Total: 8 marks

Objective

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

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

2.1 Define undercoverage.

[1]

2.2 Define nonresponse bias. [1]

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

3 Exam-style questions

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

- **A** undercoverage
 - **B** voluntary response bias
 - **C** randomization
 - **D** replication
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3.2 When selected people cannot be reached or refuse to answer, it is [1]

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

4 Go further

- work through the **3.4 Potential Problems with Sampling** lesson on the **Learn** page;

- read the **Collecting Data** section of the AP Statistics handout on the **Know** page.

Solutions

2.1 when part of the population is left out of the sampling process.

2.2 when selected individuals do not respond, distorting the results.

2.3 question wording bias (a leading or confusing question).

3.1 B.

3.2 A.

3.3 (a) question wording bias. (b) undercoverage. (c) voluntary response bias.