

Exercise walk-through

Potential Problems with Sampling ■ 3.4

eXercise

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

Method — 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.

Method — 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*.

Practice 2.1 ■ 1 mark

Define undercoverage.

Solution 2.1

Worked steps

when part of the population is left out of the sampling process **B1**.

Practice 2.2 ■ 1 mark

Define nonresponse bias.

Solution 2.2

Method: Sources of sampling bias

Worked steps

when selected individuals do not respond, distorting the results **B1**.

Practice 2.3 ■ 1 mark

State one source of bias that comes from how a question is asked.

Solution 2.3

Method: Sources of sampling bias

Worked steps

question wording bias (a leading or confusing question) **B1**.

Exam-style 3.1 ■ 1 mark

A survey in which people choose whether to respond suffers from

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

Solution 3.1

Method: Sources of sampling bias

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



Worked steps

B.

Exam-style 3.2 ■ 1 mark

When selected people cannot be reached or refuse to answer, it is

A nonresponse

B a placebo

C blocking

D an SRS

Solution 3.2

Method: Sources of sampling bias

A nonresponse



B a placebo

C blocking

D an SRS

Worked steps

A.

Exam-style 3.3 ■ 1 mark

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

- (a) Name this type of bias.
- (b) Name a bias caused by leaving out part of the population.
- (c) Name a bias when only volunteers reply.

Solution 3.3

Method: Sources of sampling bias

Worked steps

(a) question wording bias **B1**. (b) undercoverage **B1**. (c) voluntary response bias **B1**.