

Exercise walk-through

Introduction to Planning a Study ■ 3.2

eXercise

You must be able to

- distinguish an **observational study** 观察性研究 from an **experiment** 实验
- identify the **population** 总体 and the **sample** 样本
- explain why only a well-designed experiment can show **cause and effect** 因果

Method — Observational study vs experiment

- **Observational study** — observe and record **without imposing** any treatment.
- **Experiment** — deliberately **impose treatments** and compare the responses.

Method — Population and sample

The **population** is the whole group of interest; the **sample** is the part actually studied.

Method — Cause and effect

Only a **well-designed experiment** (with randomly assigned treatments) can establish a **cause-and-effect** relationship.

Practice 2.1 ■ 2 marks

State the difference between an observational study and an experiment.

Solution 2.1

Method: Observational study vs experiment

Worked steps

an observational study only observes; an experiment imposes treatments **B1** **B1**.

Practice 2.2 ■ 2 marks

State the difference between a population and a sample.

Solution 2.2

Method: Population and sample

Worked steps

the population is the whole group of interest; the sample is the part actually studied

B1 **B1**.

Practice 2.3 ■ 1 mark

State which type of study can establish cause and effect.

Solution 2.3

Method: Cause and effect

Worked steps

a well-designed experiment **B1**.

Exam-style 3.1 ■ 1 mark

Only a well-designed _____ can show cause and effect.

A observational study

B experiment

C survey

D census

Solution 3.1

Method: Cause and effect

A observational study

B experiment



C survey

D census

Worked steps

B.

Exam-style 3.2 ■ 1 mark

The group actually studied is the

A population

B sample

C treatment

D response

Solution 3.2

Method: Population and sample

A population

B sample 

C treatment

D response

Worked steps

B.

Exam-style 3.3 ■ 1 mark

Researchers give one group a new drug and another a placebo, then compare the results.

- (a) Name this type of study.
- (b) Name the whole group of interest.
- (c) State whether a cause-and-effect conclusion is possible.

Solution 3.3

Method: Population and sample

Worked steps

(a) an experiment **B1**. (b) the population **B1**. (c) yes (with random assignment) **B1**.