

Sec. 1-1 (p.5)

4. How does a **population** differ from a **sample**?

A population consists of all subjects under study while a sample is a subgroup of the population.

(母體為所欲調查範圍的全部觀察值之集合，樣本則是母體的部分集合)

5. Explain the difference between **descriptive** and **inferential** statistics.

Descriptive statistics summarize the characteristics of a data set. Inferential statistics allow you to test a hypothesis or assess whether your data is generalizable to the broader population.

(敘述性統計總結了數據集的特徵，而推論性統計則是允許進行假設檢定或 衡量數據是否可以推廣到更廣泛的人群。)

7. Why is information obtained from samples used more often than information obtained from populations?

Samples are used more than populations both because populations are usually large and because researchers are unable to use every subject in the population.

(樣本比母體使用得更多，是因為母體通常很大，研究人員無法使用母體中的每個受試者。)

✧ **descriptive or inferential statistics**

In 2025, the world population is **predicted** to be 8 billion people.

10. (Source: United Nations)

(到 2025 年，世界人口預計將達到 80 億。)

inferential statistics.

預測，即用過去的資料推斷未來的結果

Based on a sample of 2739 respondents, it is estimated that pet owners spent a total of 14 billion dollars on veterinarian care for their pets.

12. (Source: American Pet Products Association, Pet Owners Survey)

(根據對 2739 名受訪者的抽樣調查，估計這些寵物主人總共花費了 140 億美元用於寵物的獸醫護理)

descriptive statistics.

這裡的 estimated 可以看成 calculated

A study **conducted by a research** network found that people with fewer than 12 years of education had lower life expectancies than those with more years of education.

15. (根據研究網絡所進行的一項研究發現，受教育年限少於 12 年的人的預期壽命會低於受教育年限更長的人。)

inferential statistics.

因為對母體進行了概括

16. A survey of 1507 smartphone users showed that 38% of them purchased insurance at the same time as they purchased their phones.
(一項針對 1507 名智能手機用戶的調查顯示，其中 38% 的人在購買手機的同時購買了保險。)

descriptive statistics.

僅針對被調查的 1507 人描述結果

Sec. 1-2 (p.10)

✧ *qualitative or quantitative*

5. Sizes of soft drinks sold by a fast-food restaurant (small, medium, and large)
(快餐店出售的汽水 (小杯、中杯和大杯))

qualitative

(無法將小杯、中杯和大杯此特徵數量化，僅能以非數字型態作為表示，因此為屬質)

7. Cholesterol counts for individuals
(個人的膽固醇數量)

quantitative

✧ *discrete or continuous*

11. Number of phone calls received by a 911 call center each day
(每天 911 呼叫中心接到的電話數量)

discrete

12. Systolic blood pressure readings
(收縮壓的讀數)

continuous

血壓透過測量取得

✧ *boundaries of each value*

18. 6.3 millimeters (毫米)

6.25 – 6.35 millimeters

20. 19.63 tons (噸)

19.625 – 19.635 tons

22. 19 quarts (夸脫，英制及美制單位中一個的容量單位)

18.5 – 19.5 quarts

✧ *nominal-level, ordinal-level, interval-level, or ratio-level measurement*

23. Telephone numbers

nominal

24. Leap years (閏年): ... 2016, 2020, 2024, ...

interval

閏年之間的差距為 4 年，且 0 年不代表沒有這個年分

26. Scores on a final exam in statistics

ratio

0 分表示沒有一題做對 (SAT 成績是 interval 是因為 0 分可能表示做對了 0~3 題)

27. Rating of cooked ribs at a rib (排骨) cook-off (烹飪比賽)

ordinal

Sec. 1-3 (p.17)

✧ *sampling method: random, systematic, stratified, cluster*

To check the accuracy of a machine filling coffee cups, every fifth cup is selected, and the number of

11. ounces of coffee is measured.

(為檢查機器灌裝咖啡杯的準確性，每五杯選擇一次，並測量咖啡的盎司數。)

systematic

To determine how long people exercise, a researcher interviews 5 people selected from a yoga class, 5 people selected from a weight-lifting class, 5 people selected from an aerobics class, and 5

12. people from swimming classes.

(為了確定人們鍛煉多長時間，研究人員採訪了從瑜伽課中選出的 5 人、從舉重課中選出的 5 人、從有氧運動課中選出的 5 人和從游泳課中選出的 5 人。)

stratified

In a large school district, a researcher numbers all the full-time teachers and then randomly selects 30 teachers to be interviewed.

13. (在一個大型學區，一名研究人員對所有全職教師進行編號，然後隨機選擇 30 名教師進行採訪。)

random

In a medical research study, a researcher selects a hospital and interviews all the patients that day.

14. (在一項醫學研究中，研究人員選擇了一家醫院並採訪了當天的所有患者。)

cluster

Sec. 1-4 (p.24)

✧ *observational or experimental study*

A study was done on two groups of overweight individuals. Group 1 was placed on a healthy, moderate diet. Group 2 was not given any diet instructions. After 1 month, the members were

17. asked how many times they engaged in binge eating. The results of the two groups were compared.

(對兩組超重個體進行了一項研究。第 1 組採用健康、適度的飲食。第 2 組沒有給予任何飲食指導。1 個月後，成員被問到他們有多少次暴飲暴食。比較兩組的結果。)

experimental

(實驗組為第 1 組，對照組為第 2 組)

18. Two groups of students were randomly selected. The students in Group 1 were enrolled in the general studies program. Group 2 students were enrolled in a specific major program (i.e., business, engineering, social work, criminal justice, etc.). At the end of the first year of study, the grade point averages of the two groups were compared.

(隨機抽取兩組學生。第 1 組的學生參加了普通研究課程。第 2 組學生參加了特定的專業課程。在第一年學習結束時，比較兩組的平均成績。)

observational

✧ *identify **independent** and **dependent** variable*

19. According to the British Journal of Sports Medicine, a regular 30-minute workout could slash your risk of catching a cold by 43%.

(據英國運動醫學雜誌報導，定期進行 30 分鐘的鍛煉可以將感冒的風險降低 43%。)

independent variable → minute workout

dependent variable → catching a cold

20. The Journal of Behavioral Medicine reported that sharing a hug and holding hands can limit the physical effects of stress such as soaring heart rate and elevated blood pressure.
- (《行為醫學雜誌》報導說，分享一個擁抱和手牽手可以限制壓力對身體的影響，例如心率飆升和血壓升高。)

independent variable → hug and holding hands

dependent variable → heart rate and elevated blood pressure

✧ *Why the statement might be misleading*

Beneficial Bacteria

33. According to a pilot study of 20 people conducted at the University of Minnesota, daily doses of a compound called arabinogalactan over a period of 6 months resulted in a significant increase in the beneficial lactobacillus species of bacteria. Why can't it be concluded that the compound is beneficial for the majority of people?

(根據明尼蘇達大學對 20 個人進行的一項實驗研究，在 6 個月內每天服用一種稱為阿拉伯半乳聚糖的化合物會導致有益乳酸桿菌種類的顯著增加。為什麼不能得出該化合物對大多數人有益的結論？)

Only 20 people were used in the study

(樣本只有少數的 20 人，因此不足以推論說該化合物是對大多數人有益)

34. Comment on the following statement, taken from a magazine advertisement: "In a recent clinical study, Brand ABC (actual brand will not be named) was proved to be 1950% better than creatine!"
- (評論以下摘自雜誌廣告的聲明：“在最近的一項臨床研究中，Brand ABC 被證明比肌酸好 1950%!”)

The only time claims can be proved is when the entire population is used.

In an ad for moisturizing lotion, the following claim is made: "... it's the number 1 dermatologist-recommended brand." What is misleading about this claim?

- 37.** (在保濕乳液的廣告中，做出了以下聲明：“...它是皮膚科醫生推薦的第一品牌。”這種說法有什麼誤導性？)

There is no mention of how this conclusion was obtained.

An ad for an exercise product stated: "Using this product will burn 74% more calories." What is

- 38.** misleading about this statement?

(運動產品的廣告稱：“使用該產品會多燃燒 74% 的卡路里。”這種說法有什麼誤導性？)

"74% more calories" than what? No comparison group is stated.

(比什麼“多 74% 的卡路里”？未提供對照組。)