

Uses and Abuses of Statistics

統計的應用及誤用

Exercises(練習)

1. A staff member of a museum wants to conduct a survey on the visitors' opinions on the museum. She interviews a visitor every 15 minutes, choosing whoever happens to leave the museum at that time.

(a) Name the sampling method.

(b) Do you think that the sampling method can give a representative sample.

某博物館的職員要進行一項有關遊客的意見的調查。她每隔 15 分鐘訪問當時正準備離開的遊客。

(a) 這項調查採用了哪種抽樣法？

(b) 你認為這種抽樣法能得出一個具代表性的樣本？

2. A form teacher wants to select five students randomly from his class to participate in the inter-class basketball competition.

(a) What is the population of the survey?

(b) Describe how the form teacher could use simple random sampling to select the sample.

某班主任想從班中隨意選取 5 名學生參加班際籃球比賽。

(a) 寫出抽樣的總體。

(b) 描述該名班主任如何利用簡單隨機抽樣去抽取樣本。

3. Suppose the school wants to select 100 students to complete a questionnaire. A class is first selected at random and then a student is randomly selected from that class. This process is repeated until all the 100 students are selected.

(a) Do all the students have the same chance of being selected? Briefly explain your answer.

(b) Is this a simple random sampling?

某校計劃選取 100 名學生接受問卷調查。校方先從各班中隨意選取一班，再從該班中隨意選取一名學生。重複這步驟直至選出 100 名學生為止。

(a) 每名學生被選取的概率是否均等？試略作解釋。

(b) 這是否簡單隨機抽樣？

4. A manufacturer wants to conduct a quality control on the products from a production line. Suggest how he can use systematic sampling to choose the products.

一個生產商想對其生產線製的產品進行品質檢查。試提議他如何利用系統隨機抽樣來抽取樣本。

5. A student is conducting a survey on the Hong Kong people about the performance of the government. He interviews 10 people on a street randomly. Is this a good representation of the population? Discuss briefly.

一名學生正進行一項關於市民對政府表現的調查，並隨意選取了某條街道上的 10 名路人。這樣本能否有效地代表整個總體嗎？試略作解釋。

6. A survey is to be carried out to investigate the leisure activities of the staffs in an organization with 725 men and 435 women. 60 men are selected randomly.

(a) If men and women have the same chance of being selected, how many women should be selected.

(b) Which sampling method is applied in the survey?

某公司有 725 名男員工和 435 名女員工。為了調查員工的閒暇活動，調查人員隨機挑選了 60 名男員工。

(a) 若男員工和女員工被納入樣本的機會均等，有多少名女員工被納入樣本呢？

(b) 這項調查採用了哪種抽樣法？

7. A survey is to be carried out to investigate the reading habits of the students in a school, describe how stratified random sampling can be used to select the sample.

某校進行了一項有關學生閱讀習慣的調查。試描述你會如何利用層狀隨機抽樣來為這項調查進行抽樣。

8. A survey of the average daily turnover of a shop opening every day is to be conducted. It is decided to take a datum on every Wednesday.

(a) Can the data well reflect the average daily turnover of the shop? Discuss briefly.

(b) Suggest a more appropriate method.

某每天營業的商店正統計每天的平均營業額。東主收集了每個星期三的數據作計算。

(a) 這些數據能有效地反映該商店的每天平均營業額嗎？試略作解釋。

(b) 試建議一個更適當的抽樣方法。

9. A telecom company is conducting a customer survey. Can a simple random sample be chosen by selecting phone numbers on the phone list? Discuss briefly?

某電訊公司正進行一項意見調查，並透過從他們客戶的電話列表中隨機選取電話號碼進行抽樣。他們能得出一個簡單隨機抽樣的樣本嗎？試略作解釋。

10. The student association of a school conducts a survey on the time spent on extra-curricular activities. Stratified random sampling is used with clubs and societies membership as the stratifying variable. Is the sample a good representation of all the students in the school? Discuss briefly.

某校的學生會正進行一項有關學生的課外活動時間。他們採用了層狀隨機抽樣，並以校內學會會籍作為分層標準。以這方法所取得的樣本能有效代表校內所有學生嗎？試略作解釋。

Pre-requisite Questions

預備測驗

1. Name the four key stages involved in statistical surveys.

列舉統計工作的四個步驟。

2. Suggest a method to collect data in each of the following situations.

(a) A toothpaste manufacturer wants to find out the cleansing effect of its toothpaste.

(b) A researcher wants to know the population of smokers in Hong Kong and their smoking habits.

(c) A student wants to know the birth rate in Hong Kong in the past ten years.

就以下的情況，建議一個收集數據的方法。

(a) 一間牙膏生產商想知道它所生產的牙膏的清潔效能。

(b) 某位研究人員想調查香港的吸煙人數及吸煙的習慣。

(c) 某學生想調查香港在過往十年的出生率。

3. Suggest a method to collect data in each of the following situations.

(a) The HKSAR government wants to know about the number of Hong Kong citizens who had downloaded pirated movies before.

(b) A doctor wants to find out the diet of his patient.

(c) A reporter wants to find out the percentage of pedestrians who have violated the red light sign at a specific spot.

就以下的情況，建議一個收集數據的方法。

(a) 香港特別行政區政府想調查有多少香港市民曾下載盜版電影。

(b) 某位醫生向他的病人了解他的飲食習慣。

(c) 某位記者想調查在某地區的行人衝紅燈的百分比。

4. The temperatures over a ten-minute interval are recorded by an automatic temperature recording system in Tsim Sha Tsui are listed below.

12.5°C, 12.6°C, 12.6°C, 12.5°C, 12.7°C, 12.6°C, 12.7°C, 12.6°C, 53.6°C, 12.6°C

(a) Find the mean temperature by the data above.

(b) Is the result in (a) a good measure of the average temperature of Tsim Sha Tsui? Explain briefly.

一個設置在尖沙咀的氣溫記錄儀器每隔 10 分鐘把氣溫記錄一次，其記錄如下：

12.5°C, 12.6°C, 12.6°C, 12.5°C, 12.7°C, 12.6°C, 12.7°C, 12.6°C, 53.6°C, 12.6°C

(a) 求以上數據的算術平均數。

(b) (a)的結果是尖沙咀平均氣溫的一個可靠的量度嗎？試簡略解釋。

5. Identify the data collection methods used in the following cases.

- (a) Counting the numbers of vehicles passing through a certain road.
- (b) A water sample is tested for its quality.
- (c) A sheet with a few questions is attached in a magazine for collecting opinion of the readers.

就以下的情況，判別收集數據的方法。

- (a) 點算行經某條街道的車輛數目。
- (b) 檢查某個水質樣本。
- (c) 雜誌內附有一張印有數條問題的內頁作為搜集讀者意見之用。

6. For a population census in a city, nearly one million households are interviewed. State one advantage and one disadvantage of this data collection method.

在某城市的一次人口普查中，訪問了接近一百萬個家庭。試舉出這種收集數據方法的一個優點和一個缺點。

7. On a day, the temperature of the Sahara desert ranges from 10°C to 50°C . A student concludes that the mean temperature of the Sahara desert is 30°C , which is suitable for living. Do you agree with student's conclusion? Explain briefly.

撒哈拉沙漠在某天的最低和最高氣分別是 10°C 和 50°C 。由此，一名學生認為撒哈拉沙漠的平均氣溫是 30°C ，適合人類居住。你認為該名學生的結論是否正確？試簡略解釋。

Level 1 Questions

程度 1 題目

1. The librarian of the Hong Kong Central Library wants to find out the frequency of library users borrowing books from the library.
 - (a) What is the population of the survey?
 - (b) Describe how the librarian could use the simple random sampling method to select the sample.香港中央圖書館正進行一項關於讀者借閱圖書的次數的調查。
 - (a) 該次調查的總體是甚麼？
 - (b) 試描述圖書館管理員如何使用簡單隨機抽樣來選取樣本。
2. Identify the sampling methods used in the following cases.
 - (a) 0.1% of adult citizens under the age of 60 and 0.1% of adult citizens aged 60 and above are randomly selected and asked for their comments about a new health care policy.
 - (b) 200 tourists are randomly selected at the entrance of the Disneyland Resort and asked about their comments on Hong Kong's attractions.
 - (c) In a restaurant, the first customer of every 100 customers is selected for a survey on his favourite choice from the restaurant's menu.判別在下列情況下所採用的抽樣方法。
 - (a) 隨機抽取 0.1% 60 歲以下的市民與 0.1% 60 歲以上的市民，調查他們對新醫療政策的意見。
 - (b) 在迪士尼樂園的入口隨機抽取 200 名遊客，調查他們對香港的旅遊名勝的意見。
 - (c) 某餐廳調查顧客最喜愛的菜式，從每 100 位顧客中選出第 1 位顧客進行訪問。
3. 500 readers of a newspaper are selected randomly for an opinion survey.
 - (a) What is the population of the survey?
 - (b) Name the sampling method.某報章隨機抽取 500 名讀者作為樣本，並對其進行意見調查。
 - (a) 該次調查的總體是甚麼？
 - (b) 判別該報章所採用的抽樣方法。
4. In a factory, the 328th piece of every 1000 pieces of candy is selected for a quality check.
 - (a) What is the population of the survey?
 - (b) Name the sampling method.某工廠從每 1000 枚糖果中抽取第 328 枚糖果作品質測試。
 - (a) 該次測試的總體是甚麼？
 - (b) 判別該工廠所採用的抽樣方法。

5. The luggage of the first traveller of every 100 travellers walking past the Customs is checked.

(a) What is the population of the survey?

(b) Name the sampling method.

從每 100 名行經海關的旅客中，第 1 位旅客的行李會被海關檢查。

(a) 該次調查的總體是甚麼？

(b) 判別所採用的抽樣方法。

6. In a city, there are only three TV channels, namely News, Sports and Entertainment channels. The numbers of audience of these TV channels are summarized in the table below.

Channel	News	Sports	Entertainment
Number of audience	3 million	2 million	5 million

A researcher selects 1000 viewers by stratified random sampling and sends a questionnaire to each of them for a survey on TV programmes. There are 300 audiences from News, 200 audiences from Sports and 500 audiences from Entertainment in the sample.

Does the sampling method give a good representative sample? Explain briefly.

在某城市中，只有三條電視頻道，分別為新聞頻道、體育頻道和娛樂頻道。下表所示為各頻道的觀眾人數。

頻道	新聞	體育	娛樂
觀眾人數	3 百萬	2 百萬	5 百萬

一名研究人員使用層狀隨機抽樣法隨機選取 1000 名觀眾作為樣本，並對其進行有關電視節目意見的問卷調查。在該樣本中，有 300 名觀眾收看新聞頻道、200 名觀眾收看體育頻道及 500 名觀眾收看娛樂頻道。

從這種抽樣方法所得到的樣本有足夠的代表性嗎？試簡略解釋。

7. Identify the sampling methods used in the following cases.

(a) A retailer of health food selects 5% of his customers at random and asked them about their comments on the health food.

(b) In a youth centre, 4 out of 40 boys and 8 out of 80 girls are randomly selected for a survey on their favourite outdoor activities.

(c) In a company, 10 out of 200 employees under the age of 30 and 15 out of 300 employees aged 30 and above are randomly selected and asked to comment on a new company policy.

判別在下列情況下所採用的抽樣方法。

(a) 一間健康食品的批發商隨機抽取 5% 的顧客，並對其進行健康食品的意見調查。

(b) 一間青少年中心分別從 40 名男會員隨機抽出 4 名會員及 80 名女會員中隨機抽出 8 名女會員，以進行一項「最喜愛的戶外活動」的調查。

(c) 一間公司從 200 名 30 歲以下的員工中隨機選取 10 名員工，及從 300 名 30 歲以上的員工中隨機選取 15 名員工，以進行一項關於公司新政策的意見調查。

8. Identify the sampling methods used in the following cases.

- (a) 1% of licensed drivers in Hong Kong are randomly selected for a survey on the level of fines for red-light jumping.
- (b) At an entrance of an MTR station, the 5th person of every 100 people entering the station is selected and asked about his favourite means of transport.
- (c) 20 swimmers are selected at random from a beach and asked about their comments on the facilities of the beach.

判別在下列情況下所採用的抽樣方法。

- (a) 隨機抽取 1% 的香港司機，並調查他們對衝紅燈的罰款的意見。
- (b) 在某個地下鐵路的入口，從每 100 名進入該入口的人士中選出第 5 名人士進行「最方便的交通工具」的調查。
- (c) 在某海灘中隨機選取 20 名游泳人士，並對其進行一項關於海灘設施的調查。

9. A factory produces 10 000 mobile phones a day. 20 mobile phones have to be selected each day for a quality check. Suggest a suitable method to collect the sample for the quality check.

一生產商每天生產 10 000 部流動電話，其中 20 部流動電話會被抽取作品質檢查。建議一個合適的抽樣方法，以便進行品質檢查。

10. Suggest a suitable method to collect data for each of the following situations.

- (a) Lifetimes of different brands of liquid crystal display monitors (LCD monitors)
- (b) Number of days in 2004 with Red Rainstorm Warning Signal issued in Hong Kong
- (c) The most respected profession among a class of students

在下列情況中，建議一個合適的數據收集方法。

- (a) 各種不同品牌的液晶顯示螢幕(LCD 螢幕)的壽命
- (b) 香港在 2004 年間有多少天發出的紅色暴雨警告。
- (c) 某校學生最崇尚的職業

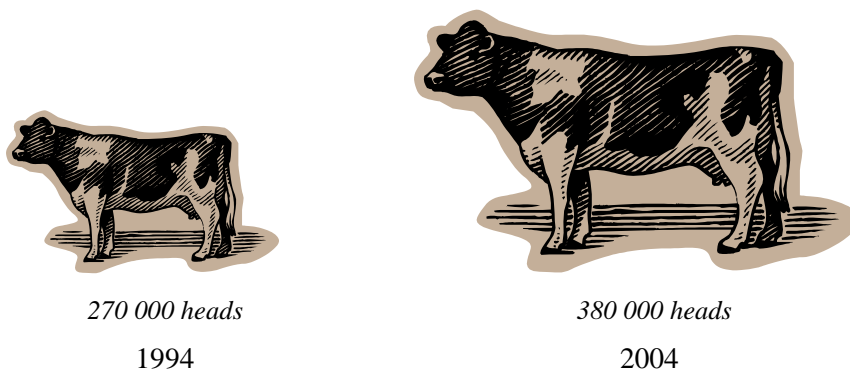
11. Suggest a suitable method to collect data for each of the following situations.

- (a) The percentage of users of mobile phones with camcorders who take photographs of others without their prior consent
- (b) The number of visitors to a temple in a day
- (c) The effects of alcohol

在下列情況中，建議一個合適的數據收集方法。

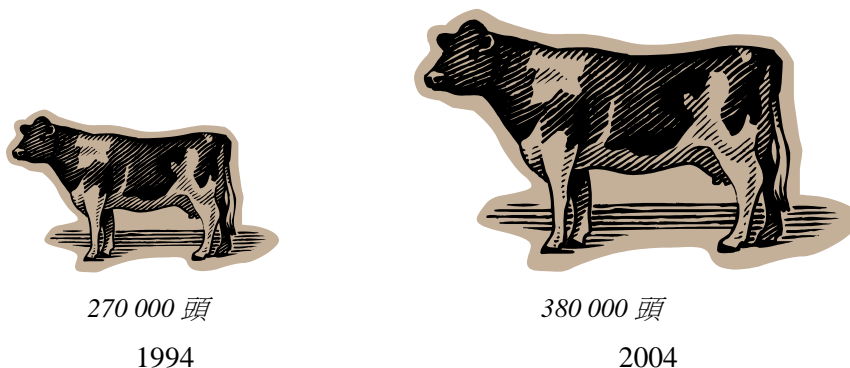
- (a) 向使用有拍攝功能的流動電話的人士調查，了解當中有多少人在沒有得到當事人的同意下替對方拍照
- (b) 某廟宇在某天的參拜人數
- (c) 酒精對人的影響

12. The meat and livestock association of a country reports the change of total number of cattle eaten in the past decade as below:



- (a) Comment on the presentation of the data.
 (b) Suggest a more appropriate presentation of the data.

以下為某國家的肉類與家畜商會報告在過去 10 年中供食用的牛的數量的變化。



- (a) 試評論以上的數據表達方法。
 (b) 建議一個較合適的數據表達方法。
13. A school has 200 boys and 800 girls. A sample of 30 students is selected by stratified random sampling for an interview. Find the number of boys in the sample.
 某校共有 200 名男生和 800 名女生。若使用層狀隨機抽樣法抽取 30 名學生進行訪問。求樣本中男生的數目。
14. Determine whether there are misuses of sampling methods or data collection methods in the following surveys. Suggest appropriate methods if there are misuses.
- (a) Students from a randomly selected class are asked to answer questionnaires about the sports facilities in their schools.
 (b) Customer are interviewed for their opinions on the cleansing effects of a detergent.
 (c) A journalist interviews families who are selected by stratified random sampling from different districts in order to ascertain the living standards of Hong Kong people.

判別以下的情況是否有誤用抽樣方法或誤用數據收集方法。若有的話，試建議一個改善方法。

- (a) 在某學校中隨機抽取其中一個班別作調查對象，了解學生進行該校的體育設施的意見。
- (b) 訪問使用某清潔劑的顧客了解該清潔劑的效能。
- (c) 某記者使用層狀隨機抽樣法選取居住在香港不同地區的家庭，並對其進行訪問，以了解香港市民的生活水平。

15 A company has 50 Chinese employees, 20 British employees and 10 Korean employees. A sample of 16 employees is selected by stratified random sampling according to their nationality for an interview.

- (a) How many Korean employees should be selected?
- (b) What is the probability of a Korean employee being selected?

一間公司有 50 名中國籍僱員、20 名英國籍僱員和 10 名韓國籍僱員。根據他們的國籍，使用層狀隨機抽樣法抽取 16 名僱員作為樣本。

- (a) 求韓國籍僱員被納入樣本中的數目。
- (b) 求某個韓國籍僱員被納入樣本的概率。

Level 2 Questions

程度 2 題目

1. A survey aims to find out the popular leisure activities for teenagers under 16 in Hong Kong. 250 teenagers who are selected by simple random sampling are successfully interviewed through telephone between 9:00 a.m. and 2:00 p.m. from Monday to Friday. From the results of the survey, two popular leisure activities are 'Sleeping' and 'Watching TV'.

- (a) Do you think that the sampling method is appropriate? If not, suggest a more appropriate method.
- (b) Can the result of the survey conclude the popular leisure activities of the teenagers? Explain briefly?

現正進行一項 16 歲以下青少年最喜愛娛樂的調查。透過簡單隨機抽樣法抽取 250 名青少年，並成功在周一至周五的 9:00 am 至 2:00 pm 期間進行電話訪問。從調查的結果得知，兩項最受歡迎的娛樂是「睡覺」和「看電視」。

- (a) 你認為抽樣的方法是否合適？若不合適，試建議另一個較合適的方法。
- (b) 這個調查的結果能代表青少年的最喜愛的娛樂嗎？試簡略解釋。

2. A survey is conducted about the anti-ageing effect of a drink *SuperX* by telephone interview. A sample of 2000 Hong Kong people are selected randomly for the survey. According to the result of the survey, 80% of the interviewees agreed that Vitamin E has an anti-ageing effect. Since *SuperX* contains 300 mg of Vitamin E, the manufacturer of *SuperX* concluded that *SuperX* has an anti-ageing effect.

Discuss the validity of the conclusion.

一次關於飲品「超級 X」的抗衰老調查是透過電訪問形式進行。訪問對象為 2000 名隨機選取的香港市民。根據調查結果，80% 的受訪者同意維他命 E 有抗衰老的效果。由於飲品「超級 X」含有 300 mg 的維他命 E，於是「超級 X」的生產商總結「超級 X」有抗衰老的效果。評論這個結論的可靠度。

3. A researcher wants to compare the sales of two newspapers and he collects the sales figures of the newspapers at a newsstand for a week.

- (a) Can the sales figures conclude which newspaper sells more? Explain Briefly
- (b) Suggest an improvement for the collection method of the sales figures.

一位研究員想比較兩份報章的銷量。他在一個報攤收集了該兩份報章於一星期內的銷售數字。

- (a) 這些銷售數字能反映哪一份報章的銷售量較多嗎？試簡略解釋。
- (b) 對於上述的調查，試舉出一個改善數據收集的方法。

4. An organization conducts an online opinion poll to collect opinions from Hong Kong citizens on a famous department store. Is the sample a good representation of the population?

一個組織在互聯網上進行一項調查，了解香港市民對某大百貨公司的意見。這調查所用的樣本有足夠的代表性嗎？

5. A supermarket claims that its products are on average 2% cheaper than another supermarket. This is based on a statistical survey on 400 products from a store of another supermarket.

- (a) Can the data accurately reflect the difference in the price levels of the products in two supermarkets? Explain briefly.
- (b) Suggest a more appropriate data collection method to compare the price levels of the products in two supermarkets.

一間超級市場聲稱它的貨品的價格平均較另一間超級市場低 2%，並說這是對照另一間超級市場的 400 件貨品的價格的統計結果。

- (a) 這些數據能確實反映兩間超級市場的貨品的價格的差異嗎？試簡略解釋。
- (b) 建議一個能比較兩間超級市場的貨品的價格差異的數據收集方法。

6. A youth centre has interviewed 400 teenagers aged 13 – 18 who are selected by simple random sampling. 40% of the teenagers answered that Tuen Mun is the district that has the most juvenile crimes. Comment on the result of the survey.

一間青少年中心透過隨機抽樣法抽取了 400 名 13 歲至 18 歲的青少年，並對其進行訪問。其中 40% 的受訪者認為屯門區有較多的青少年罪行發生。試評論該調查的結果。

7. The blood type of human can be classified into four types, namely, type A, type B, type O and type AB. The distribution of blood type of the ese population is summarized below:

Blood type	A	B	O	AB
Frequency (%)	31%	28%	34%	7%

The ratio of males to females in the Chinese population is 106:100.

It is assumed that the sex of a person is independent of his/her blood type. A sample of 1000 Chinese people is selected by stratified random sampling according to the blood type for a survey, how many of them are female and of blood type O? (Correct your answer to the nearest integer.)

人的血型可分為 4 種：A 型、B 型、O 型和 AB 型。下表所示為中國人的血型的分佈。

血型	A	B	O	AB
頻數 (%)	31%	28%	34%	7%

已知中國人的男性與女性的人數之比為 106:100。

假設性別與血型是獨立的事件。若利用血型作為分層標準，透過層狀隨機抽樣法抽取 1000 名中國籍人士，問當中有多少名女士的血型是 O 型？(答案準確至最接近的整數。)

8. A manufacturer of mooncake claims that he is the bestseller of mooncake because he is the best seller of mooncakes with three egg yolks. Comment on the validity of manufacturer's claim.

某月餅生產商聲稱其月餅最暢銷，因為其三黃月餅在市場中最暢銷。試評論該生產商的結論的可靠度。

9. A study reports that there are 60 000 patients in United States (US) suffering from a certain disease in 1950 and there are 100 000 patients suffering the same disease in US in 2004. The study concludes that the disease has become more popular nowadays due to the modern life styles. Discuss the validity of the conclusion.

[Reference data: The population of US was 152 million in 1950 and it is 294 million in 2004.]

一項研究顯示在 1950 年中，有 60 000 名美國人感染某種疾病；而在 2004 年中，則有 100 000 名美國人感染該種疾病。該研究報告認為在現代的生活模式下，該種疾病會更為普遍。試評論該研究報告的結果。

[參考數據：在 1950 年時，美國人口為一億五千二百萬人；而在 2004 年時，美國人口為二億九千四百萬人。]

10. According to a survey, 70% of the customers of a magazine store are readers of the newspaper “Orange Daily”. Do you think that the “Orange daily” has the largest market share in the newspaper market?

根據某項調查，某售賣雜誌的商店 70% 的顧客都購買「鮮橙日報」。你認為「鮮橙日報」擁有報章市場最大的市場佔有率嗎？

11. An independent laboratory carry out a test for the effectiveness of the medicine produced by company A and company B. The result states that 40 out of 80 patients are cured by the medicine of company A. and 24 out of 80 patients are cured by the medicine of company B. So, company A advertises that its medicine can cure 67% more patients than the medicine of company B. Comment on the validity of the statement in the advertisement.

一間獨立的實驗室就兩間公司 A 和 B 的藥物進行測試，結果指出在 80 名病人中，有 40 名病人能被公司 A 的藥物治癒，而在另一組的 80 名病人中，只有 24 名病人能被公司 B 的藥物治癒。於是，公司 A 在廣告中宣傳其藥物較公司 B 的能多治癒 67% 的病人，試評論該廣告的可靠度。

Level 2+ Questions

程度 2+ 題目

1. 80 students were selected from a secondary school by simple random sampling. They were asked whether they washed their hands after they had been to the toilet. 98.8% of the students answered 'yes'. Comment on the result of the survey.

某中學採用簡單隨機抽樣法抽取了 80 名學生，並對其進行訪問，訪問的目的是了解他們如廁後，有沒有洗手的習慣。結果顯示有 98.8% 的學生表示他們如廁後有洗手的習慣。試評論該訪問的結果。

2. 100 customers of shampoo A are chosen randomly for a survey about the quality of the shampoo. 85% of the customers are very satisfied with shampoo A. However, a survey conducted by a popular magazine showed that only 30% of its readers satisfy the quality of shampoo A.

Discuss the apparent discrepancy between the two survey results.

100 名使用洗髮露 A 的顧客被隨機抽取作為該洗髮露品質調查的對象。調查結果顯示 85% 的顧客滿意洗髮露 A 的品質。另一方面，某本流行雜誌的調查發現其讀者中只有 30% 滿意洗髮露 A。試解釋這兩項調查的結果為甚麼會有顯著的不同。

3. 10000 questionnaires are sent to university graduates in Hong Kong who graduated before 1980 to investigate their average income. The graduates are selected by simple random sampling. 753 questionnaires are completed and returned. According to the survey, the average monthly income is \$48 000. Comment on the result of the survey.

10 000 份關於月薪調查的問卷發給一些在 1980 或以前畢業的大學畢業生，這些畢業生的樣本是由簡單隨機抽樣所得的。現成功收回 753 份問卷。根據調查結果，畢業生的平均月薪為 \$48 000。試評論該調查的結果。

4. A survey aims to find out the relationship between TV-games and obesity. 2000 children from different countries are selected for the survey. The survey reports that the children who play TV-games are subject to a higher chance of obesity when they become adult. Discuss the validity of the survey result.

某項調查想找出痴肥與電視遊戲的關係。2000 名來自不同國家的兒童被選取作為調查對象。該調查報告指出玩電視遊戲的兒童有較大的機會在他成年後出現痴肥。試評論這調查結果。

5. In a survey conducted in Hong Kong by an international market research company, 35% of doctors who smoke choose brand A cigarettes. The manufacturer of brand A cigarettes claims that its cigarettes are healthier than cigarettes of other brands. Comment on the claim by the manufacturer.

某國際市場研究公司在香港進行一項調查，調查顯示 35% 有吸煙習慣的醫生會選擇品牌 A 的香煙。品牌 A 的香煙生產商聲稱品牌 A 的香煙較其他的品牌健康。試評論這調查結果。

Multiple Choice Questions

多項選擇題

1. Which of the following may lead to an invalid conclusion in a survey conducted by questionnaire?

- I. Small sample size
- II. Random sampling method
- III. Misleading question.

- A. I and II only
- B. I and III only
- C. II and III only
- D. I, II and III

在進行問卷調查時，下列何者會導致錯誤的結論？

- I. 樣本數目過小
- II. 簡單隨機抽樣法
- III. 誤導性的提問

- A. 只有 I 及 II
- B. 只有 I 及 III
- C. 只有 II 及 III
- D. I、II 及 III

2. 50 readers from the Harry Potter Reading Club are selected randomly for a survey. What is the population of the survey?

- A. All readers of Harry Potter
- B. Members of the Harry Potter Reading Club
- C. The chosen 50 readers
- D. The researcher of the survey

從哈利波特的書友會中，隨意選取 50 名會員作調查對象。該項調查的總體是甚麼？

- A. 所有哈利波特的讀者
- B. 哈利波特的書友會的會員
- C. 被選取的 50 名會員
- D. 該項調查的研究員

3. Which of the following is NOT true for stratified random sampling?

- A. The sample obtained is representative.
- B. It saves time and money.
- C. The sample covers every member of the population.
- D. Every member of the population has an equal probability of being selected.

下列何者關於層狀隨機抽樣法是不正確的？

- A. 所抽出的樣本具代表性。
- B. 節省時間和金錢。
- C. 該樣本包含總體的每個成員。
- D. 總體中的每個成員被抽取的概率相等。

4. An officer of the Customs and Exercise Department carries out a body search of any person who is barked by a police dog. Which sampling method is used?

- A. Simple random sampling
- B. Systematic sampling
- C. Stratified random sampling
- D. Non-probability sampling

若警犬向某旅客吠叫，則海關的官員便會向該旅客進行搜身。問海關採用了哪種抽樣方法？

- A. 簡單隨機抽樣法
- B. 系統隨機抽樣法
- C. 層狀隨機抽樣法
- D. 非概率抽樣法

5. A researcher of the consumer council wants to study the electricity consumption levels of several brands of refrigerators. Which of the following are suitable data collection methods?

- I.** Questionnaire
- II.** Interview
- III.** Experiment
- A.** I only
- B.** II only
- C.** III only
- D.** I and II only

消費者委員會的一個研究員想研究不同品牌的冰箱的耗電量。下列何者是合適的數據收集方法？

- I.** 問卷
- II.** 訪問
- III.** 實驗
- A.** 只有 I
- B.** 只有 II
- C.** 只有 III
- D.** 只有 I 及 II

6. A soft drink company produces 20 000 000 bottles of drink a day. The first bottle of drink from every 100 000 bottles is selected for a quality check. Which sampling method is used?
- A.** Simple random sampling
 - B.** Systematic sampling
 - C.** Stratified random sampling
 - D.** Non-probability sampling

某汽水生產商每天生產 20 000 000 瓶汽水。他從每 100 000 瓶生產的汽水中，抽取第 1 瓶汽水作品質檢查。問他採用了哪種抽樣方法？

- A.** 簡單隨機抽樣法
- B.** 系統隨機抽樣法
- C.** 層狀隨機抽樣法
- D.** 非概率抽樣法

7. A youth centre plans to conduct a survey about the issue of drug abuse on teenagers

under 18. Which of the following are suitable data collection methods?

- I.** Questionnaire
- II.** Interview
- III.** Observation
- A.** I only
- B.** II only
- C.** III only
- D.** I and II only

一間青少年中心正進行一項關於 18 歲以下的青少年濫用藥物的調查。下列何者是合適的數據收集方法？

- I.** 問卷
- II.** 訪問
- III.** 觀察
- A.** 只有 I
- B.** 只有 II
- C.** 只有 III
- D.** 只有 I 及 II

8. The owner of a restaurant plans to conduct a survey on the service quality of the restaurant. Stratified random sampling is used to select a sample of customers for the survey. Which of the following are appropriate stratifying variables?

- I.** Age
- II.** Sex
- III.** club members / non-club members
- A.** I and II only
- B.** I and III only
- C.** II and III only
- D.** I, II and III

某會所的東主計劃進行一項有關該會所的服務質素調查。若使用層狀隨機抽樣法選取顧客作樣本，下列何者是合適的分層標準？

- I.** 年齡
- II.** 性別

III. 會所會員 / 非會所會員

- A. 只有 I 及 II
- B. 只有 I 及 III
- C. 只有 II 及 III
- D. 只有 I、II 及 III

D. 只有 I、II 及 III

9. A school has 900 girls and 600 boys. If stratified random sampling is used to select a sample of 30 students, how many girls should be selected?

某校有 900 名女生和 600 名男生。若採用層狀隨機抽樣法抽取 30 名學生作樣本，問有多少名女生會被納入樣本中？

- A. 12
- B. 18
- C. 21
- D. 24

10. The management of a newspaper wants to conduct an opinion poll on its readers. Stratified random sampling is used to select a sample for the survey. Which of the following are appropriate stratifying variables?

- I. Occupations of readers
 - II. District of the readers' home address
 - III. Sex of the reader
- A. I and II only
 - B. I and III only
 - C. II and III only
 - D. I, II and III

某報章的管理層想向讀者進行意見調查。若採用層狀隨機抽樣法抽取樣本，下列何者是合適的分層標準？

- I. 讀者的職業
 - II. 讀者住址所屬的地區
 - III. 讀者的性別
- A. 只有 I 及 II
 - B. 只有 I 及 III
 - C. 只有 II 及 III