

Sampling Method and Surveys Practice for Excellence

1. A high school's student newspaper plans to survey local businesses about the importance of students as customers. From telephone book listings, the newspaper staff chooses 150 businesses at random. Of these, 73 return the questionnaire mailed by the staff. Identify the population of interest, the sample, the sampling method, sampling or non-sampling error, and any bias present.

2. How much sleep do high school students get on a typical school night? An interested student designed a survey to find out. To make data collection easier, the student surveyed the first 100 students to arrive at school on a particular morning. These students reported an average of 7.2 hours of sleep the previous night.

(a) What type of sampling method did the student obtain?

(b) Explain why this sampling method is biased. Is 7.2 hours probably higher or lower than the true average amount of sleep last night for all students at the school? Why?

3. Your statistics class has 35 students. You want to call an SRS of 6 students from your class to ask where they use a computer for the online questions from homework.

(a) Explain how you would use the line of random digits below to choose a SRS of 6 students. Explain your method clearly enough for Mr. Daniel to obtain your results.

(b) Now use the line below to select the sample. Show how you use each of the digits and write down the sample of 6.

14459 26056 31424 80371 65103 62253 22490 61181

4. Archeologists plan to examine a sample of 2-meter-square plots near an ancient Greek city for artifacts in the ground. They choose separate random samples of plots from floodplain, coast, foothills, and high hills. What kind of sample is this?

- a) Cluster sample b) Convenience sample c) An SRS d) Stratified random sample
e) Voluntary response sample

5. An example of a nonsampling error that can reduce the accuracy of a sample survey is

- a) using voluntary response to choose the sample
b) using the telephone directory as the sampling frame.
c) interviewing people at shopping malls to obtain a sample.
d) variation due to chance in choosing a sample at random.
e) inability to contact many members of the sample.

Review from Chapter 3

6. A researcher reported that the average teenager needs 9.3 hours of sleep per night but gets only 6.3 hours. By the end of a 5-day school week, a teenager would accumulate about 15 hours of "sleep debt." Students in a high school statistics class were skeptical, so they gathered data on the amount of sleep debt (in hours) accumulated over time (in days) by a random sample of 25 high school students. The resulting least-squares regression equation for their data is $\widehat{\text{Sleep debt}} = 2.23 + 3.17(\text{days})$. Do the students have reason to be skeptical of the research study's reported results? Explain.