

Six Types of Bias

Convenience Sample Bias

Single class survey,
Daytime customer study,
Local hospital data

Easily accessed sample,
not representative

Examples:

Non-representative
samples

Volunteer Sample Bias

Health-conscious survey,
Political poll, Gym fitness
study

Examples:

Undercoverage Bias

Inadequate
representation

Examples:

Internet survey, Landline
poll, Urban school study

Nonresponse Bias

Examples:

Income survey, Clinical
trial, Political phone
survey

Certain groups don't
respond

Response Bias

Charity overstatement,
Classroom drug use
survey, Political poll
alignment

Inaccurate responses

Examples:

Healthcare question,
Pollution question, Animal
testing question

Wording of Question Bias

Leading or emotionally
charged questions

Examples:

AP Statistics Practice Questions: Sampling Methods and Biases

1. A high school principal wants to survey student opinions on school lunches. She decides to ask every student who walks into the cafeteria during lunchtime. What type of sampling method is this?

- a. Stratified sample
- b. Simple random sample
- c. Voluntary response sample
- d. Convenience sample
- e. Cluster sample

2. A company wants to survey customer satisfaction. They send an email to all customers and include a survey link, encouraging them to fill it out. What type of sampling method is being used?

- a. Stratified sample
- b. Systematic sample
- c. Voluntary response sample
- d. Cluster sample
- e. Random sample

3. A polling organization randomly selects 10 students from each grade level (freshman, sophomore, junior, and senior) to participate in a

survey about homework habits. What is this sampling method?

- a. Simple random sample
- b. Stratified random sample
- c. Systematic sample
- d. Cluster sample
- e. Convenience sample

4. Which of the following is a disadvantage of using a convenience sample in a survey?

- a. It's difficult to conduct.
- b. The sample may not be representative of the entire population.
- c. It requires too much time and effort.
- d. It always leads to bias.
- e. It's too expensive to implement.

5. A teacher wants to find out if students are prepared for a test. She randomly selects every 5th student from her class roster. What type of sampling is this?

- a. Cluster sampling
- b. Simple random sampling
- c. Systematic sampling
- d. Stratified sampling
- e. Convenience sampling

6. Which sampling method is most likely to avoid bias and give a good representation of the population?

- a. Convenience sampling
- b. Simple random sampling
- c. Voluntary response sampling
- d. Cluster sampling
- e. Judgmental sampling

7. The school administration randomly selects one grade level (9th, 10th, 11th, or 12th) and surveys every student in that grade. What is this sampling method?

- a. Simple random sample
- b. Stratified sample
- c. Cluster sample
- d. Convenience sample
- e. Systematic sample

8. Why might a voluntary response sample lead to bias in a survey?

- a. It doesn't include enough participants.
- b. It only includes people who feel strongly about the topic.
- c. It includes too many responses.
- d. It's expensive to collect.
- e. It requires randomization.

9. A scientist surveys 200 randomly selected households across five different neighborhoods. What advantage does this sampling method offer?

- a. It ensures every household in the city is surveyed.
- b. It provides a balanced view from multiple neighborhoods.
- c. It eliminates bias by including every household.
- d. It is more convenient than other methods.
- e. It focuses only on wealthy neighborhoods.

10. What is the main problem with using a voluntary response sample to estimate public opinion on an issue?

- a. It's too expensive.
- b. It over-represents people with strong opinions.
- c. It requires a large sample size.
- d. It doesn't use random selection.
- e. It is difficult to organize.

11. A political party selects a sample by choosing 100 voters from rural areas and 100 voters from urban areas. What type of sampling is this?

- a. Simple random sample
- b. Stratified random sample
- c. Systematic sample
- d. Cluster sample
- e. Convenience sample

12. A survey conducted by a university asks students to visit their website to complete a survey about

campus facilities. What type of bias is most likely to occur?

- a. Undercoverage bias
- b. Voluntary response bias
- c. Nonresponse bias
- d. Sampling bias
- e. Measurement bias

13. The local library wants to survey the reading habits of community members. They decide to ask every 10th person who enters the library. What is a potential problem with this sampling method?

- a. It could lead to undercoverage of people who don't visit the library.
- b. It ensures equal representation.
- c. It's difficult to implement.
- d. It's too expensive to conduct.
- e. It requires too much time.

14. A researcher divides a city into districts and then randomly selects three districts to survey all the residents in those areas. What sampling method is this?

- a. Simple random sample
- b. Stratified random sample
- c. Cluster sample
- d. Systematic sample
- e. Voluntary response sample

15. If a sampling method consistently underestimates or overestimates the population parameter, what type of bias is this?

- a. Nonresponse bias
- b. Sampling bias
- c. Measurement bias
- d. Response bias
- e. Voluntary response bias

16. A company wants to understand customer satisfaction, so they call only customers who have made large purchases. What type of bias might this create?

- a. Nonresponse bias
- b. Undercoverage bias
- c. Voluntary response bias
- d. Measurement bias
- e. Sampling bias

17. What is one advantage of using stratified random sampling over simple random sampling?

- a. It's easier to conduct.
- b. It guarantees the sample will be representative of key subgroups.
- c. It eliminates all bias.
- d. It is cheaper.
- e. It reduces sample variability.

18. Which type of sampling is most likely to suffer from selection bias?

- a. Random sample
- b. Systematic sample
- c. Convenience sample
- d. Stratified sample
- e. Cluster sample

19. In a survey about food preferences, a researcher finds that people overstate how much they like healthy foods when asked face-to-face. What type of bias is this?

- a. Nonresponse bias
- b. Undercoverage bias
- c. Response bias
- d. Measurement bias
- e. Voluntary response bias

20. A polling firm selects participants by randomly dialing phone numbers, but only landlines are called. What potential bias might this lead to?

- a. Nonresponse bias
- b. Voluntary response bias
- c. Undercoverage bias
- d. Sampling bias
- e. Measurement bias

21. What is one disadvantage of cluster sampling?

- a. It guarantees that each subgroup of the population is represented.
- b. It may not provide as much precision as stratified sampling.
- c. It is very difficult to conduct.
- d. It always leads to voluntary response bias.
- e. It's more expensive than other methods.

22. A university wants to survey students on campus safety. They decide to randomly select students from each dormitory. What type of sampling method is this?

- a. Simple random sample
- b. Stratified random sample
- c. Cluster sample
- d. Systematic sample
- e. Convenience sample

Answers

1. d. Convenience sample
2. c. Voluntary response sample
3. b. Stratified random sample
4. b. The sample may not be representative of the entire population
5. c. Systematic sampling
6. b. Simple random sampling
7. c. Cluster sample
8. b. It only includes people who feel strongly about the topic
9. b. It provides a balanced view from multiple neighborhoods
10. b. It over-represents people with strong opinions
11. b. Stratified random sample
12. b. Voluntary response bias
13. a. It could lead to undercoverage of people who don't visit the library
14. c. Cluster sample
15. b. Sampling bias
16. b. Undercoverage bias
17. b. It guarantees the sample will be representative of key subgroups
18. c. Convenience sample
19. c. Response bias

20. c. Undercoverage bias

21. b. It may not provide as much precision as stratified sampling

22. b. Stratified random sample