

2.3 Sampling Techniques

1. Identify the population for each of the following questions.
 - a) Who should be the next president of the students' council?
 - b) Who should be next year's grade-10 representative on the student council?
 - c) What is the your favourite soft drink?
 - d) Which Beatles song was the best?
 - e) How effective is a new headache remedy?

students in the particular school

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1.
 - a) students in the particular school
 - b) grade 10 students in the particular school
 - c) you
 - d) all those who have listened to the Beatles' music
 - e) all those who have tried the new remedy

2. Classify the sampling method used in each of the following scenarios.
- a) A radio-show host invites listeners to call in with their views on banning smoking in restaurants.
 - b) The Heritage Ministry selects a sample of recent immigrants such that the proportions from each country of origin are the same as for all immigrants last year.
 - c) A reporter stops people on a downtown street to ask what they think of the city's lakefront.
 - d) A school guidance counsellor arranges interviews with every fifth student on the alphabetized attendance roster.

2. Classify the sampling method used in each of the following scenarios.
- a) A radio-show host invites listeners to call in with their views on banning smoking in restaurants. voluntary-response sample
 - b) The Heritage Ministry selects a sample of recent immigrants such that the proportions from each country of origin are the same as for all immigrants last year. stratified sample
 - c) A reporter stops people on a downtown street to ask what they think of the city's lakefront. convenience sample
 - d) A school guidance counsellor arranges interviews with every fifth student on the alphabetized attendance roster. systematic sample

- e) A statistician conducting a survey randomly selects 20 cities from across Canada, then 5 neighbourhoods from each of the cities, and then 3 households from each of the neighbourhoods.
- f) The province randomly chooses 25 public schools to participate in a new fundraising initiative.

- e) A statistician conducting a survey randomly selects 20 cities from across Canada, then 5 neighbourhoods from each of the cities, and then 3 households from each of the neighbourhoods. multi-stage sample
- f) The province randomly chooses 25 public schools to participate in a new fundraising initiative. cluster sample

9. **Application** The host of a call-in program invites listeners to comment on a recent trade by the Toronto Maple Leafs. One caller criticizes the host, stating that the sampling technique is not random. The host replies: "So what? It doesn't matter!"
- What sampling technique is the call-in show using?
 - Is the caller's statement correct? Explain.
 - Is the host's response mathematically correct? Why or why not?

9. **Application** The host of a call-in program invites listeners to comment on a recent trade by the Toronto Maple Leafs. One caller criticizes the host, stating that the sampling technique is not random. The host replies: "So what? It doesn't matter!"

a) What sampling technique is the call-in show using?

Voluntary response sample

b) Is the caller's statement correct? Explain.

Yes (only those who are interested would call in so collected data is not a true representation of the population)

c) Is the host's response mathematically correct? Why or why not?

Yes if the host mentions the underlying sampling bias.

No if the host claims the callers are representative of the population

2.4 Sampling Bias

1. Classify the bias in each of the following scenarios.
 - a) Members of a golf and country club are polled regarding the construction of a highway interchange on part of their golf course.
 - b) A group of city councillors are asked whether they have ever taken part in an illegal protest.
 - c) A random poll asks the following question: "The proposed casino will produce a number of jobs and economic activity in and around your city, and it will also generate revenue for the provincial government. Are you in favour of this **forward-thinking** initiative?"
 - d) A survey uses a cluster sample of Toronto residents to determine public opinion on whether the provincial government should increase funding for the public transit.

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sampling bias

b) A group of city councillors are asked whether they have ever taken part in an illegal protest.

response bias

c) A random poll asks the following question: "The proposed casino will produce a number of jobs and economic activity in and around your city, and it will also generate revenue for the provincial government. Are you in favour of this **forward-thinking** initiative?"

measurement bias–
-loaded question

d) A survey uses a cluster sample of Toronto residents to determine public opinion on whether the provincial government should increase funding for the public transit.

A cluster of neighbourhood may have biased opinion about services of public transit in their area.

sampling bias- cluster may not be representative