

1. For the following report about statistical studies, identify the following items (if possible). If you can't tell, then say so—this often happens when we read about a survey.

A question posted on the Lycos Web site on 18 June 2000 asked visitors to the site to say whether they thought that marijuana should be legally available for medicinal purposes. (www.lycos.com)

- a) The population
All US adults
- b) The population parameter of interest
proportion that feels marijuana should be legalized for medicinal purposes.
- c) The sampling frame
All people with access to website
- d) The sample
Those visiting the website who responded.
- e) The sampling method, including whether or not randomization was employed
voluntary response
(no randomization employed)
- f) Any potential sources of bias you can detect and any problems you see in generalizing to the population of interest
Voluntary Response Bias

2. **Parent opinion, part 2.** Let's revisit the school system described in Exercise 1. Four new sampling strategies have been proposed to help the PTA determine whether parents favor requiring elementary students to pass a test in order to be promoted to the next grade. For each, indicate what kind of sampling strategy is involved and what (if any) biases might result.

- a) Run a poll on the local TV news, asking people to dial one of two phone numbers to indicate whether they favor or oppose the plan.
voluntary response bias
(sample)
- b) Hold a PTA meeting at each of the 20 elementary schools, and tally the opinions expressed by those who attend the meetings.
voluntary response bias
only strongly motivated parents attend PTA meetings.
- c) Randomly select one class at each elementary school and contact each of those parents.
Multistage
stratified by elementary school and then clustered by grade.
- d) Go through the district's enrollment records, selecting every 40th parent. PTA volunteers will go to those homes to interview the people chosen.

Systematic Sampling

As long as starting point is randomized, this method should produce reliable data.

3. **Playground.** Some people have been complaining that the children's playground at a municipal park is too small and is in need of repair. Managers of the park decide to survey city residents to see if they believe the playground should be rebuilt. They hand out questionnaires to parents who bring children to the park. Describe possible biases in this sample.

Convenience sample

- managers will get responses from people who come to the park to use the playground.
- parents who are dissatisfied with the playground may not come.

4. **Happy workers?** A manufacturing company employs 14 project managers, 48 foremen, and 377 laborers. In an effort to keep informed about any possible sources of employee discontent, management wants to conduct job satisfaction interviews with a sample of employees every month.

a) Do you see any potential danger in the company's plan? Explain.

A small sample will probably consist mostly laborers, with few supervisors, and maybe no project managers. There is a potential for response bias based on the interviewer if a member of management asks directly about discontent.

b) Propose a sampling strategy that uses a simple random sample.

Assign a # from 001 to 439 to each employee. Use a random # table or software to select the sample.

c) Why do you think a simple random sample might not provide the representative opinion the company seeks?

There are relatively few supervisors and project managers, and we want to make sure their opinions are noted.

d) Propose a better sampling strategy.

Stratify the sample by job type. Sample a certain percentage by each job type.

e) Listed below are the last names of the project managers. Use random numbers to select two people to be interviewed. Explain your method carefully.

Barrett
DeLara
Maceli
Rosica
Williams

Bowman
DeRoos
Mulvaney
Smithson
Yamamoto

Chen
Grigorov
Pagliarulo
Tadros

Assign each person a # from 01-14, and generate 2 usable random #'s from a random # table.