

MAT 100 Homework #5 Key

1a. The population is the whole set you want to know about.
The sample is a subset of the population to get an idea of what the population is like

b. Census asks everyone in the population (measures)
Survey asks just a sample

c. parameter is a characteristic of the population
Statistic is the (same) characteristic of the sample

2. answers will vary

under coverage - does not get all aspects of the population
(missing some points of view)

Can occur w/ a convenience sample

nonresponse - biased sample result from those selected for

Survey refusing to answer

telephone survey when there is no answer

voluntary response - only those w/ strong feelings respond

(make extra effort) to respond

mail-in survey

3. a. systematic sample

b. simple random

c. cluster sample

d. convenience sample

e. stratified sample

4. The sample is not random; people who knew you or found in one location may not represent the whole population

5. People have caller ID and don't answer phone if # unrecognized.
Not that many people have landlines any more.

6. Quota sampling tries to match the # of people in the sample to the proportions in the population.

Stratified sampling may be used to compare opinions of different populations; and may not be recombined; sample sizes not required to be proportional.

7. Two events that are related can be correlated but not causal. The correlation may be accidental or caused by a third variable.

ice cream sales increase in July and so does crime

→ they may both be caused by higher temperatures in summer

8. Doctors may reveal their biases to patients unknowingly. Not all experiments can be done blind, never mind double blind.

9. The placebo effect is a way of describing improvement not related to the experimental treatment. Placebo is for positive effects and nocebo is for negative effects. Improvement (or decline) can be caused for many reasons (natural improvement over time due to immune response, psychological bias/expectation, etc. Controls are necessary to ensure treatment improves over doing nothing.

10. Ethical concerns are important because experiments in the past have done harm to patients. Scientific truth is important, but not at the cost of harm. Examples will vary.

11. See attached

11. Below are two examples of a simple experiment diagram. In the textbook, it describes the effects of coffee, and the Salk polio vaccine study. Diagram these experiments on the corresponding diagrams below. Be sure to include such information as how control and experimental groups were determined, and what treatment was provided each group (placebo is a "treatment" in this context), and what measurements were taken at the end to compare results.

