Homework 9-7

Statistics Chapter 9: What did they do? Organizer – KEY

Use the chart below to organize your answers to exercises 9-16.

	Population	Population parameter	Sampling frame	Sampling method; randomization used	Potential sources of bias generalization problem
14. Consumers Union	All U.S. adults	Proportion who have used and benefited from alternative medical treatments	All Consumers Union subscribers	Not specified, but probably a questionnaire mailed to all subscribers	Voluntary response bias. Those who respond strong feelings one way or another.
15. Marijuana	All U.S. adults	Proportion that feels marijuana should be legalized in Wisconsin.	None given –potentially all people with access to web site	Voluntary response (no randomization employed)	Voluntary response bias. Those who visit the respond may be predisposed to a particular an focus is Wisconsin, but the poll is accessible t from around the world who may have interest
16. Bar	Adults	Proportion who think drinking and driving is a serious problem	Bar patrons	Systematic sampling	Undercoverage. Those interviewed had just le may have opinions about drinking and driving from the opinions of the population in general
17. Voters	City voters	Not clear. They might be interested in the percentage of voters favoring various issues.	All city residents	Multistage sampling; stratified by district and clustered by block	Convenience sampling. Once the block is ran chosen as the cluster, every resident living in should be surveyed, not just those that were c available. A random sample of each block cou taken, but we wouldn't refer to that as "cluste but rather multi-stage, with stratification by di simple random sample of one block within ea and another simple random sample of resident block.
18. EPA	Soil around a former waste dump	Proportion with elevated levels of harmful substances	Accessible soil around the dump	Not clear. There is no indication that the samples were selected randomly.	Possibly a convenience sample. Since there is indication of randomization, the samples may taken from easily accessible areas. Soil in thes be more or less polluted than the soil in gener
19. Roadblock	All cars	Proportion of cars with up-to-date (or out-of-date) registrations, insurance, or safety inspections	Cars on that road	Cluster sample of an area, stopping all cars within the cluster	Undercoverage. The cars stopped might not b representative of all cars because of time of da location. The locations are probably not chose so might represent areas in which it is easy to roadblock, resulting in a convenience sample.
20. Snacks	Snack food bags	Proportion passing inspection	All bags produced each day	Multistage sampling. Presumably, they take a simple random sample of 10 cases, followed by a simple random sample of one bag from each case.	No indication of bias.
21. Milk	Milk produced by a dairy farm	Whether or not the milk contains dirt, antibiotics, or foreign matter	Milk produced by the farm on any given day	Not specified	Unbiased, as long as the day of inspection is r chosen. This might not be the case, however, farms might be spread out over a wide geogra Inspectors might tend to visit farms that are n another on the same day, a convenience samp

*Name*_____ *Statistics Chapter 9: Review*

Multiple Choice

___ 1. On July 5-8, 2014, The Gallup organization telephoned a random sample of 1,028 adults in all 50 U.S. states and the District of Columbia. They found that 41% supported a decrease in immigration. Which is true?

I. The population of interest is all U.S. adults.
II. 41% is a statistic and not the actual percentage of all U.S. adults who strongly ~~oppose~~ support ↓ in imm. ~~the lawsuit~~.
III. This sampling design should provide a reasonably accurate estimate of the actual percentage of all U.S. adults who strongly ~~oppose this lawsuit~~ support ↓ in imm.

Parameter - # for pop.

A) I only B) II only C) III only D) I and II E) I, II, and III

___ 2. A school district has three high schools. The district decides to randomly test high school students for attention deficit disorder (ADD). The school board creates a list of all of the students from the three high schools and randomly samples 250 students from that list. Is this a simple random sample?

A) Yes, because the students were chosen at random.
B) Yes, because this method could choose any 250 high school students from throughout the district.
C) No, because we can't guarantee that there are students from each school in the sample.
D) No, because we can't guarantee that there are students from each high school grade in the sample.

___ 3. A chemistry professor who teaches a large lecture class gives a survey during class about how he can make the class more interesting. He is hoping he can get more students to attend his class. This survey method suffers from which of the following?

A) voluntary response bias
B) nonresponse bias
C) response bias
D) undercoverage
E) None of the above

4. Describe Response Bias and Non-Response Bias.

Response Bias - caused by a problem with the study design (ex. principal survey about drugs)

Non-Response Bias - caused by not getting responses from everyone selected for the study (don't know what non-responders are thinking)

5. A statistics teacher wants to know how her students feel about an introductory statistics course. She decides to administer a survey to a random sample of students taking the course. She has several sampling plans to choose from. Name the sampling strategy in each.

   a) There are four grade levels of students taking the class: freshmen, sophomores, juniors, and seniors. Randomly select 15 students from each grade level — Stratified

   b) Randomly select a grade level (freshmen, sophomores, juniors, and seniors) and survey every student in that grade level — Cluster

   c) Each student has a nine-digit student number. Randomly choose 60 numbers. — SRS

   d) Using the class roster, select every fifth student from the list. — Systematic

6. Name and describe the kind of bias that might be present if the statistics teacher decides that instead of randomly selecting students to survey on how they feel about the course she just...

   a) asks students to volunteer for the survey.
   Voluntary Response Bias - People choose to participate

   b) gives the survey during class one day.
   Undercoverage - students not there aren't surveyed

7. A college group is investigating student opinions about funding of the military. They phone a random sample of students at the college, asking each person one of these questions (randomly chosen):

   A: *"Do you think that funding of the military should be increased so that the United States can better protect its citizens?"*

   B: *"Do you think that funding of the military should be increased?"*

   Which question do you expect will elicit greater support for increased military funding? Explain. What kind of bias is this?

   (A) B/c of the emotional response caused by the wording.
   * Response Bias.