**OpenIntro Questions 1.9 to 1.37**

1.9 a. Population of interest-All preterm births in the year of 1989 and 1993 in Southern California. Sample – 143,196 preterm births.

b. If 143,196 preterm births for years 1989 and 1993 can represent the entire population then the study can be generalized but any causal relationships can’t be developed.

1.16

a. Percent with Bachelor’s degree explains the affect on Per capita income.

b. Both the variables are positively, linearly and strongly related. There are no unusual observations as such.

c. No we can’t conclude because it’s an observational study not experimental study.

1.17 a. Observational study

b. Stratified sampling

1.18 a. Observational study

b. Multistage sampling

1.19 a.Both are non-linear, positive, weak association.

b. Observational study

c. Income of the person might affect both internet usage ability and life expectancy

1.20 a. Observational study

b. No. since it’s only observational.

c. Students drinking more coffee and then not sleeping, can suffer from high stress due to lack of sleep.

1.21 a. Random sampling can be done.

b. The opinion might differ for different field of study so stratified sampling can be used.

c. The clusters of different ages might contain varied number of students which can result in irregular sample size. The students of similar age might have same opinion so within cluster heterogeneity might differ.

1.22 a. Through random digit selection chances of selection of each possible combination will be equally likely whereas in phonebook selection an unintentional or intentional bias can arise.

1.23 a. 200 sampled men and women are individual cases.

b. Attitude towards microwave oven

c. Dispositional attitude

d. Yes

e. Observational study because there is no difference between any group of people on which experiment is performed and not performed.

f. No since it’s observational.

g. If 200 men and women are considered to be the representation of the whole population then it can be generalized.

1.24 a. A random sample from just an elementary school then the variety of sample might be limited. It can’t be generalized. It can underestimate the true value.

1.25 a. Questionnaire should be have more questions like, ‘how many kids do you have’?

Questions should also be asked to students, if they are satisfied with the time their parents spend with them.

b. Since out of 1000 only 50% of the women were able to answer the follow up survey it can’t be generalized to all 1000 mothers. They should have recorded the contact of all mothers for further follow up.

c. Without any experiment orthopedist can’t conclude that running decreases the risk of joint problems.

1.26 a. No a random sample might be expensive.

b. Stratified sampling

c. Cluster sampling.

d. Multistage sampling.

e. Multistage sampling

1.27 a. Random sampling. Unintentional bias can arise for the non-responding students.

b. Convenience sample

c. Convenience sampling.

d. Multistage sampling

1.28

a. No we can’t conclude that smoking causes dementia later in life as in the gap of 23 years the people can be accustomed other habits which are related to possible dementia in later life,

b. The statement is not justified as only from the total sample only a third were having behavioral issues/bullies. Their could be other possible reasons which can lead to sleep disorders.

1.29 103 undergraduate students can not represent the large population of Facebook users as these students will share some common characteristics like age, field of study etc but on facebook there are users from different age groups.

1.30 a. This is an experimental study.

b. Causal relationship can’t be developed because experiments is not conducted with similar conditions for both the groups.

1.31 a. performance of a student

b. Effect of light level – Fluorescent, yellow, no lighting

c. Gender is the blocking variable – male female

1.32 a.Experiment

b. Explanatory –Large doses of Vitamin C Response – Duration of common cold

c. Yes

d. No

e. Yes it introduces the confounding variable of patient’s will to take the medicine as they are not forced to take the medicine during the experiment.

1.33 a.Exam performance

b. Effect of light level – Fluorescent, yellow, no lighting Effect of noise- No noise, Construction noise, Human chatter noise.

c. Blocking variable – Sex

1.34 Response variable - level of learning

Explanatory variable – Music without lyrics, Music with lyrics, no music

Divide the students into three groups randomly and then let them learn. Assess the levels after 1 week.

1.35 Divide the students in two groups. The packaging of regular coke and diet coke should be same. One group is given regular coke and other is give diet coke. Record the results.

1.36 a. Experimental

b. Treatment group – who exercises Control group – who doesn’t exercises.

c. Age is the blocking the variable.

d. No

e. Results can be used to establish a causal relationship. if the sample is considered to representation of whole population then it can be generalizes.

f. Yes

1.37. a. Experimental.

b. Experimental – Chia seeds Control – No Chia seeds

c. Blocking used- Gender

d. No since the patients volunteered.

e. The sample size is very small, based on this it can’t be generalized for a large population.Although study is experimental a causal statement can be made. but there were no significant changes observed in both groups we can’t make a causal statement.