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Identifying Patterns

Problem Set 1

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1. a. You cannot say that the reason for more crimes in Michigan than in Minnesota is due to Minnesotans being more law abiding citizens. There could be confounding factors, such as the number of police authorities or the number of job opportunities.

b. People could have become more law abiding from 1991 to 2001. However, it could be that public safety became more diligent or education levels increased.

4. a. They studied men and women at different age groups because bodies of men and

women react differently to different substances. In addition, as we age, our bodies react

differently, perhaps heal less quickly, compared to younger ages.

b. One should not start smoking, because it is well known that smoking has many possible health consequences. However, whether you currently smoke or recently stopped, health issues can occur. Smokers that recently quit could be less healthier than the current smokers because their bodies are adjusting to no longer smoking, trying to rid the bad chemicals.

5. Yes, the zinc-sulfate should be given as a treatment. Whether or not it actually works, a placebo effect could trick the brain into thinking it is working. As we discussed in class, doctors do this all the time, for example, prescribing one antibiotics when he or she has a viral infection (even though we now know this course creates super bacteria resistant to antibiotics, which is very bad).

6. Several variables could be taken into account for the reason some patients didn’t improve in the first half of the experiment, but did in the second half. Emotional state of patients could affect the reason for no improvement. If one believes they are not getting better or have no hope, then it will reflect their progress. However, if one is positive about their treatment, it could help their progress. Another factor could be the way their body is responding to the zinc sulfate initially. Many drugs and supplements take a while to even have an effect on one’s health. For example, my Lyme disease medication actually makes my symptoms worse when I first start treatments, but gradually my symptoms settle into more of a pattern, rather than several days of flaring.

7. a. This is not a controlled experiment, but an observational study.

b. They adjusted for age, because depending on the age, one could be more susceptible to the cancer. They adjusted for education, because depending on the type and length of education, one could not have had sexual education. They adjusted for marital status because women who have more sexual partners have a higher risk of acquiring an STD.

c. Women using the pill could be more apt to not use a second form of contraception, a condom, because they feel safe enough with just the pill. While women not taking the pill, I would think and hope, would use contraception like a condom because they are more likely to get pregnant than women using the pill.

d. No they were not justified because there are so many other factors that could be taken into consideration. We now know that the HPV virus can cause cervical cancer, so it could not necessarily be due to the oral contraceptives.

8. No they do not prove that Burglars go to work on vacations weeks/weekends, because 25 percent of all burglaries happen during Labor Day and Memorial Day weekends. We don’t know when the other 75 percent happen.

9. a. False- The experiment showed that there was no difference for death rate due to colon cancer between the control and treatment group.

b. True

c. False. The people conducting the controlled experiment get to choose what group the people go in so there is no confounders.

10. a. This is an observational study.

b. All they found was controlling mother’s tend to have heavier children. There is no proof that there is a correlation.

c. Children could have a tendency to eat more if they were stressed as a result of their mother, but it could also be that the child has a slower metabolism. There are many factors that could leave to more body fat.

d. A gene for obesity would not support that controlling mothers tend to have heavy children, just that the gene could cause obesity if the child’s body activated the gene.

e. The psychological effect of a controlling mother could be a reason for the association, as well as income level could affect the association. Cheaper food tends to be the food worse for you, so lower income a families end up eating worse.

f. No, it does not support the advice on child-rearing.

11. a.The treatment group is the people who join the program. The control group is the people that do not join the control group.

b. It is an observational study.

c. False, It shows that is help some people, but people who leave prison without the program could not end up back in prison because of their own will.

12. False, because the percentages of the different wards as a whole could result in there being an even amount of republicans or even more republicans. Fractions are tricky. Like the example we did in class on batting averages. The percentage each year of A could be higher than another batter, B, but over a span of years, B’s batting average could average out to be higher than A’s batting average.