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Identifying Patterns Problem Set 1

1. A. I believe that the investigator was incorrect when he hypothesized that Minnesota residents are more law abiding than Michigan residents. Michigan may have more residents than Minnesota, allowing the amount of crimes to be higher, while still keeping the same ratio of crimes to citizen the same. Also, Michigan may have a select group of citizens who commit a majority of the crimes. Thus the crime statistic does not reflect all the citizens of Michigan.

B. This situation is similar to the previous crime example. The rise in the amount of crimes is not indicative of a United States population that is less law abiding. The investigator doesn’t take into account the possible population increase, which could make the ratio of crimes to individual the same in the two years. Also, stricter laws may have been enacted by 2001.

 4. A. They studied men and women separately because the male body may react differently to smoke than the female body will. They studied different age groups separately because as people get older they are naturally more susceptible to disease, thus less healthy, than younger age groups. This group skews the results if they were all studied together.

 B. The statement that you shouldn’t start smoking, but once you’ve started, don’t start, is completely false. The study was not attempting to say this. The people who had recently stopped smoking, most likely stopped smoking because the smoking was causing health problems. If people are still smoking they clearly haven’t contracted any health problems from smoking. This explains why people who had recently stopped smoking were in worse health.

 5. Zinc sulfate should not be given to treat the disease. The results of the double blind study indicate that there was an experimenter bias in the first experiment where only the subjects were blind. The double blind study could not have had an experimenter bias, so it is more reliable. Therefore its results should be used, indicating that zinc sulfate is not needed to treat this disease.

 6. It could be assumed that neither the zinc nor the placebo had any medical effect the disease. However, since the subjects knew the design of the experiment they may have naturally assumed that during the second half of the study they were on the zinc, which they probably thought would help them. They convinced themselves that they were getting better due to what they thought was the zinc.

 7. A. This was an observational study because the experimenters had no control over the subjects.

 B. All of these factors may have been confounding factors in determining whether the pill caused cervical cancer. Younger people may naturally be less at risk for cancer. For education they may have felt that a more educated person would practice better sexual precautions, possibly decreasing the risk of cervical cancer. For marital status it is possible that cervical cancer is contagious and could be transferred from one’s spouse.

 C. Women who are not on the pill are less likely to engage in sexual activity, than women on the pill. Women are more likely to contract cervical cancer the more they engage in sexual activity.

 D. The conclusion was not justified by the data. It is just as possible that the increased sexual activity of those on the pill led to the increased rate of cervical cancer. There would have to be a controlled study conducted in order to prove that the pill had any effect on the rate of cervical cancer.

 8. No the statistics do not prove that burglars go to work when other people are on vacation. They may go to work at this time for several reasons that do not include vacations. This period studied may be the toughest economic time for people, resulting in them taking desperate acts that include robbery.

 9. A. This is false because the observational studies said that colon cancer death rates were decreased with vitamins. The controlled studies showed that vitamins had no effect on deaths from colon cancer.

 B. This statement is true. People who eat a lot of fruits and vegetables most likely care more about their health. For this reason they probably participate in other activities that make them healthier. The healthier a person is the less likely they will die of cancer.

 C. This statement is false because the subjects in the experiments were not existing vitamin users. Thus, the lifestyle of a person who consumes a large amount of vitamins doesn’t apply here.

 10. A. This was an observational study because the subjects were not controlled in the study.

 B. Yes the experiment found that younger children with more body fat tended to have more controlling mothers.

 C. It could be a possible explanation, but it is not the definite reason for the children having more body fat. The mothers may be more controlling because the children naturally gained more weight than other children, and the mothers were trying to prevent this from continuing.

 D. A gene for obesity would not explain the association because the gene would have no effect on why a mother was controlling.

 E. The mothers may be more controlling because the children naturally gained more weight than other children, and the mothers were trying to prevent this from continuing.

 F. The data does not support the Chronicles advice because it offers no proof that the controlling mother is the cause of the increased body fat.

 11. A. The treatment group is the people who go to the boot camp and the control groups are the people who are released without participating in the boot camp.

 B. It is observational because they are examining the effects of the boot camp over time.

 C. This is false because there was no data actually given. All we can go off of is the prison spokesman’s word, which could have a bias.

 12. After looking at the Derek Jeter versus David Justice example of how someone can lead in batting average over 3 seasons, but have a lower overall batting average, it would be reasonable to assume that the same is possible with this example. However, after trying many different possible examples, it is not possible because in the Jeter/Justice example, they had different amount of at bats per season. In this example, though, each group had the same total number of inhabitants per ward. This makes it impossible for this situation.