Chapter 4 FRAPPY! Sample #1

Directions: Show all your work. Indicate clearly the methods you use, because you will be scored on the correctness of your methods as well as on the accuracy and completeness of your results and explanations.

In a recent study, 166 adults from the St. Louis area were recruited and randomly assigned to receive one of two treatments for a sinus infection. Half of the subjects received an antibiotic (amoxicillin) and the other half received a placebo.

(a) Describe how the researchers could have assigned treatments to subjects if they wanted to use a completely randomized design.

To assign treatments randomly, you could write A and B on 166 note cards (83 with A and 83 with B), put the cards in a hat and draw at random and give one card to each adult recruited.

(b) All the subjects in the experiment had moderate, severe, or very severe symptoms at the beginning of the study. Describe one statistical benefit and one statistical drawback for using subjects with moderate, severe, or very severe symptoms instead of just using subjects with very severe symptoms.

Benefit: Since the subjects had all kinds of levels of sinus infections, the results and conclusions drawn could be applied generally to all people with sinus infections. Therefore, conclusions can be drawn about the antibiotic's overall effectiveness.

Drawback: Because the levels of sinus infections that the subjects had varies, results are going to have more variability. Thus, precise conclusions cannot be drawn about the level of effectiveness of the antibiotic.

Sample #1

(c) At different stages during the next month, all subjects took the sino-nasal outcome test. After 10 days, the difference in average test scores was *not* statistically significant. In this context, explain what it means for the difference to be not statistically significant.

The results could be due to random chance.

(d) One possible way that researchers could have improved the study is to use a randomized block design. Explain how the researchers could have incorporated blocking in their design.

The researchers could have grouped the subjects according to the severity of their sinus infections (moderate, severe, very severe). They could then randomly assign half of the people in each group to the antibiotic treatment and the other halves to the placebo.

Chapter 4 FRAPPY! Sample #2

Directions: Show all your work. Indicate clearly the methods you use, because you will be scored on the correctness of your methods as well as on the accuracy and completeness of your results and explanations.

In a recent study, 166 adults from the St. Louis area were recruited and randomly assigned to receive one of two treatments for a sinus infection. Half of the subjects received an antibiotic (amoxicillin) and the other half received a placebo.

(a) Describe how the researchers could have assigned treatments to subjects if they wanted to use a completely randomized design.

Give each person a number from 1 to 166. Then, use a random number generator to divide the subjects into 2 groups of 83. Flip a coin. If it is heads, the first group gets the antibiotic. If it is tails, the second group gets the antibiotic.

(b) All the subjects in the experiment had moderate, severe, or very severe symptoms at the beginning of the study. Describe one statistical benefit and one statistical drawback for using subjects with moderate, severe, or very severe symptoms instead of just using subjects with very severe symptoms.

One benefit of using people with moderate, severe, or very severe symptoms is that we have a much larger population than if we only used people with very severe symptoms. However, a drawback is that we won't be able to tell if the results were due to the antibiotic or to the symptoms.

Sample #2

(c) At different stages during the next month, all subjects took the sino-nasal outcome test. After 10 days, the difference in average test scores was *not* statistically significant. In this context, explain what it means for the difference to be not statistically significant.

The average test scores for the antibiotic and placebo groups weren't very different.

(d) One possible way that researchers could have improved the study is to use a randomized block design. Explain how the researchers could have incorporated blocking in their design.

The researchers could have blocked their design by separating the subjects with moderate, severe, + very severe symptoms and given half of each block groups the placebo and the other half the antibiotic and then compared the results of the three groups.