

Stat 104 – Homework 4
Due Thursday October 1, 2009

Reading: September 22 – September 29 Chapter 4

Assignment:

1. Complete the following problems from the text: 4.3, 4.7, 4.8, 4.15, 4.20, 4.21, 4.37, and 4.39.
2. The following is excerpted from an article written by Paul Recer, Associated Press, that appeared in the February 6, 2002 Des Moines Register.

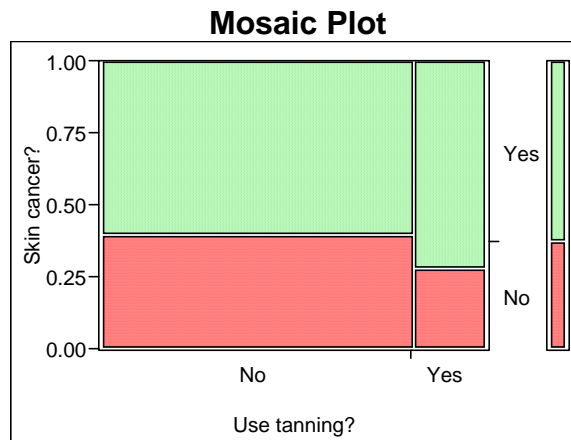
Study: Tanning raises cancer risk.

In a study in today's *Journal of the National Cancer Institute*, researchers found that people who used tanning devices were 1.5 to 2.5 times more likely to have common kinds of skin cancer than were people who did not use the devices.

Researchers looked at the medical records and interviewed 1436 people. Of these, 896 had basil cell or squamous cell skin cancer. The other 540 people did not have either cancer.

Among the skin cancer patients, 190 reported using tanning devices at some time. Of those without skin cancer, only 75 had used tanning devices.

- a. What is the response variable? Is it categorical or numerical?
- b. What is the explanatory variable? Is it categorical or numerical?
- c. Why is this study an observational study and not an experiment? Explain briefly.
- d. Is this study a retrospective or prospective study? Explain briefly.
- e. Below is a mosaic plot of the summarized data. Does this plot agree with the reported finding “that people who used tanning devices were 1.5 to 2.5 times more likely to have common kinds of skin cancer than were people who did not use the devices.”? Explain briefly.



3. A FOX News/Opinion Dynamics Poll conducted September 15 – 16, 2009 asked 900 randomly selected registered voters in the U.S. “Do you support or oppose sending additional U.S. troops to Afghanistan?” 369 responded Support, 450 responded Oppose and 81 responded Unsure.
- What is the population?
 - What is the population parameter?
 - What is the sample?
 - What proportion of the sample supports sending additional U.S. troops to Afghanistan?
 - Is the proportion in d. a statistic or a parameter? Explain.
 - What is the margin of error for this poll?
 - Given the margin of error, does a majority of the registered voters in the U.S. support sending additional U.S. troops to Afghanistan? Explain briefly.
4. The following is excerpted from an article that appeared in the January 21, 2007 Des Moines Register.

Broccoli, tomatoes work better together.

Broccoli and tomatoes – two vegetables known to help fight cancer – are more effective against prostate cancer if they’re eaten together as part of a daily diet than if they’re eaten alone, a new study with rats suggests.

Researchers fed a diet containing 10% broccoli powder and 10% tomato powder to a group of rats that had been implanted with prostate cancer cells. Another group of rats received only the 10% broccoli powder while a third group of rats received only the 10% tomato powder.

After 22 weeks, the researchers found that the combined broccoli/tomato diet was the most effective in reducing the prostate cancer (measured as % reduction in prostate tumor size).

- Why is this study an experiment and not an observational study? Explain briefly.
- Identify the response variable. What type of variable is this? Qualitative/Categorical or Quantitative/Numerical?
- What are the treatments? Be specific.
- Is there a control group in this experiment? Explain briefly.
- Suppose the study involved 30 rats with implanted prostate cancer cells. Each rat is identifiable by a 2-digit number, 01 to 30, on an ear tag. The ear tag numbers are related to age, so that 01 is the youngest rat and 30 is the oldest rat. Explain how you would assign rats to the various diet groups. Be specific. Actually do the assignment and include a list of the ear tag numbers of the rats in each of the diet groups.