Statistical Reasoning Name:

Explanatory and Response Variables

Identify the explanatory and response variables.

1) The National Student Loan Survey provides data on the amount of debt for recent college graduates, their current income, and how stressed they feel about college debt. A sociologist looks at the data with the goal of using amount of debt and income to explain the stress caused be college debt.

2) How does drinking beer affect the level of alcohol in our blood? The legal limit for driving in all states is 0.08%. In a study, adult volunteers drank different numbers of cans of beer. Thirty minutes later, a police officer measured their blood alcohol levels.

3) A study published in the New England Journal of Medicine (March 11, 2010) compared two medicines to treat head lice: an oral medication called Ivermectin and a topical lotion containing malathion. Researchers studied 812 people in 376 households in seven areas around the world. Of the 185 randomly assigned to Ivermectin, 171 were free from head lice after two weeks compared to only 151 of the 191 households randomly assigned to malathion. Identify the experimental units, explanatory and response variables, and the treatments in this experiment.

4) A pediatrician wants to know whether watching TV causes girls to be overweight. She interviews 173 11-year-old girls and records the number of hours of TV each girl watches per day and whether each girl is overweight. She finds that girls in the sample who watch more than 2 hours of TV per day are over twice as likely to be overweight than girls in the sample who watch fewer than 2 hours of TV per day.

5) A team of veterinarians wants to compare the effectiveness of two fertility treatments for pandas in captivity. The two treatments are in-vitro fertilization and male fertility medications.

6) A public speaking teacher has developed a new lesson that she believes decreases student anxiety in public speaking situations more than the old lesson. She designs an experiment to test if her new lesson works better than the old lesson. Public speaking students are randomly assigned to receive either the new or old lesson; their anxiety levels during a variety of public speaking experiences are measured.