Producing Data

Chapters 8-9

Problem 1 (9.13)

The relationship between healthy diet and prevalence of cataracts was assessed using a sample of 1808 participants from the Women's Health Initiative Observational Study. Having a high Healthy Eating Index score was the strongest predictor of a reduced risk of cataracts, among modifiable behaviors considered. The Healthy Eating Index score was created by the U.S. Department of Agriculture and measures how well a persons diet conforms to recommended healthy eating patterns. The report concludes: 'These data add to the body of evidence suggesting that eating foods rich in a variety of vitamins and minerals may contribute to postponing the occurrence of the most common type of cataract in the United States.'

a) Explain why this is an observational study rather than an experiment.

b) Although the result was statistically significant, the authors did not use strong language in stating their conclusions, using words such as 'suggesting'and 'may'. Do you think that their language is appropriate given the nature of the study? Why?

Problem 2 (9.16)

Researchers from the United Kingdom studied the effect of two breathing frequencies on performance times and on several physiological parameters in front crawl swimming. The breathing frequencies were one breath every second stroke (B2) and one breath every fourth stroke (B4). Subjects were 10 male collegiate swimmers. Each subject swam 200 meters, once with breathing frequency B2 and once on a different day with breathing frequency B4. Are there any problems with having swimmers choose their own breathing frequency and then swim 200 meters using their selected frequency?

Problem 3

Researchers studied a group of 10,892 middle-aged adults over a period of nine years. They found that smokers who quit had a higher risk for diabetes within three years of quitting than either nonsmokers or continuing smokers. Is it reasonable to conclude that stopping smoking causes the short-term risk for diabetes to increase? Explain why or why not?