

Unit 3 – Populations and Samples Practice Problems

Due: Monday October 17, 2011

Before you begin: Problem #1 gives you practice in distinguishing between target population and sampling frame.

1. For each of the following situations, define the target population, and how you might obtain a sample. What will be your sampled population? How does this differ from the target population?
 - a. A city engineer wants to estimate the average weekly water consumption for single family dwelling units in the city.
 - b. A physician wants to estimate the average length of time from initial diagnosis with ovarian cancer to death.

Before you begin: Problem #2 gives you practice in working with the idea that bias can (and often does!) occur in sampling. A nice url on this topic is available from StatTrek AP tutorials.
<http://stattrek.com/AP-Statistics-2/Survey-Sampling-Bias.aspx?Tutorial=AP>

2. Which of the following estimates are likely to be biased? Why? Is the bias positive or negative? Why? (*note: Positive bias means a consistent likelihood of overestimating, negative bias is underestimating*).
 - a. You estimate the average number of bank customers waiting for service whenever the bank is open by counting the number of customers whenever you go to the bank.
 - b. You estimate the proportion of 7-12 year old children using helmets when they ride bikes by asking parents if their child wears a helmet when the child is brought to the physician's office for a "well" visit.
 - c. A highway patrolman parks next to a highway and records speeds on his radar to estimate the percentage of people exceeding the speed limit on that highway.