SAMPLING

- A **sample survey** selects a **sample** from the **population** of all individuals about which we desire information. We base conclusions about the population on data from the sample. It is important to specify exactly what population you are interested in and what variables you will measure.
- The **design** of a sample describes the method used to select the sample from the population. **Random sampling** designs use chance to select a sample.
- The basic random sampling design is a **simple random sample (SRS).** An SRS gives every possible sample of a given size the same chance to be chosen.
- Choose an SRS by labeling the members of the population and using **random digits** to select the sample. Software can automate this process.
- To choose a **stratified random sample,** classify the population into **strata,** groups of individuals that are similar in some way that is important to the response. Then choose a separate SRS from each stratum.
- Failure to use random sampling often results in **bias,** or systematic errors in the way the sample represents the population. **Voluntary response samples,** in which the respondents choose themselves, are particularly prone to large bias.
- In human populations, even random samples can suffer from bias due to **under coverage** or **non-response,** from **response bias,** or from misleading results due to **poorly worded questions.** Sample surveys must deal expertly with these potential problems in addition to using a random sampling design.
- Most national sample surveys are carried out by telephone, using **random digit dialing** to choose residential telephone numbers at random. Call screening is increasing non-response to such surveys, and the rise of cell-phone-only households is increasing under-coverage.

REVIEW QUESTIONS

Seat belt use.

A study in Nyahururu looked at seat belt use by drivers. Drivers were observed at randomly chosen convenience stores. After they left their cars, they were invited to answer questions that included questions about seat belt use. In all, 75% said they always used seat belts, yet only 61.5% were wearing seat belts when they pulled into the store parking lots.17 Explain the reason for the bias observed in responses to the survey. Do you expect bias in the same direction in most surveys about seat belt use?

Sampling at a party.

At a party there are 30 students over age 21 and 20 students under age 21. You choose at random 3 of those over 21 and separately choose at random 2 of those under 21 to interview about attitudes toward alcohol. You have given every student at the party the same chance to be interviewed: what is that chance? Why is your sample not an SRS?

Sampling at a party.

At a large block party there are 290 men and 110 women. You want to ask opinions about how to improve the next party. To be sure those women's opinions are adequately represented; you decide to choose a stratified random sample of 20 men and 20 women. Explain how you will assign labels to the names of the people at the party. Give the labels of the first 3 men and the first 3 women in your sample.