

## Worksheet 10/16/2024

**Population** = the complete set of things under study

**Sample** = a subset of the population from which data is collected

**Population parameters** = the quantities that are of interest

**Sample statistics** = the quantities found in the sample

**Sampling methods:** simple random sampling, systematic sampling, convenience sampling, cluster sampling, stratified sampling.

**Two basic types of statistical studies:** observational study, experiment (single anonymous/ double anonymous/ non-anonymous).

For Problem 1 and 2, identify the population, sample, population parameters, and sample statistics.

1) In order to gauge public opinion on the President's plan to contain Iran's nuclear program, the Pew Research Center surveyed 1001 Americans by telephone.

2) A higher education research organization conducts an annual study of attitudes of incoming college students by surveying approximately 250,000 first-year students at 340 colleges and universities. There are approximately 1.4 million first-year college students in this country.

3) You want to determine the average number of classes skipped by first-year students at BYUH during a particular semester. State whether each of the following samples is likely to be representative and explain why or why not.

Sample 1: The first 100 first-year students whom you meet at the Aloha Center

Sample 2: 100 first-year students who live off-campus

Identify the sampling method (simple random sampling, systematic sampling, convenience sampling, cluster sampling, or stratified sampling) in the following studies.

4) *US Weekly* magazine predicts Grammy Award winners by polling readers who voluntarily respond by email.

5) Student ID numbers are randomly selected by a computer for a survey of student opinions on college athletics.

6) An IRS auditor randomly selects for audits 30 taxpayers in each of the filing status categories: single, head of household, married filing jointly, and married filing separately.

7) A taste test for chips and salsa is conducted at the entrance to a supermarket.

8) A consumer report journalist wants to publish a blog about the most popular cars in the U.S. She has decided to use publicly available vehicle registration data to identify the most often registered car makes. She uses a random number generator (RNG) to pick out 4 from the list of all 50 states in the U.S. From each state, she then uses an RNG to pick two counties, and then repeats to identify two cities or towns.

Determine whether each of the studies described is observational or an experiment. If the study is an experiment, identify the control and treatment groups and discuss whether making the study single- or double-anonymous is necessary. If the study is observational, determine if it is a case-control study.

9) A study enrolled 2002 runners to look for relationships between specific types of running injuries and variables such as height, weight, body mass index, age, and running history.

10) Using a survey of 1502 Americans, the Pew Research Center determined that 85% of Americans believe that the country is more politically divided than in the past and that those divisions will persist.