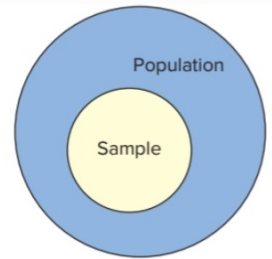


Exercises 1-1

4. How does a population differ from a sample?

A **population** consists of all subjects (human or otherwise) that are being studied.

A **sample** is a group of subjects selected from a population.



For Exercises 9–17, determine whether descriptive or inferential statistics were used.

9. Because of the current economy, 49% of 18- to 34- year-olds have taken a job to pay the bills. (Source: Pew Research Center) *Inferential*
10. In 2025, the world population is predicted to be 8 billion people. (Source: United Nations) *Inferential*
11. In a weight loss study using teenagers at Boston University, 52% of the group said that they lost weight and kept it off by counting calories. *descriptive*
12. Based on a sample of 2739 respondents, it is estimated that pet owners spent a total of 14 billion dollars on veterinarian care for their pets. (Source: American Pet Products Association, Pet Owners Survey) *descriptive*
13. A recent article stated that over 38 million U.S. adults binge-drink alcohol. *Inferential*
14. The Centers for Disease Control and Prevention estimated that for a specific school year, 7% of children in kindergartens in the state of Oregon had nonmedical waivers for vaccinations. *Inferential*
15. A study conducted by a research network found that people with fewer than 12 years of education had lower life expectancies than those with more years of education. *Inferential*
16. A survey of 1507 smartphone users showed that 38% of them purchased insurance at the same time as they purchased their phones. *descriptive*
17. Forty-four percent of the people in the United States have type O blood. (Source: American Red Cross) *Inferential*

Exercises 1–2

For Exercises 5–10, determine whether the data are qualitative or quantitative.

- Sizes of soft drinks sold by a fast-food restaurant (small, medium, and large) *qualitative*
- Pizza sizes (small, medium, and large) *qualitative*
- Cholesterol counts for individuals *quantitative*
- Microwave wattage *quantitative*
- Number of degrees awarded by a college each year for the last 10 years *quantitative*
- Ratings of teachers *qualitative*

For Exercises 11–16, determine whether the data are discrete or continuous.

- Number of phone calls received by a 911 call center each day *Discrete*
- Systolic blood pressure readings *Continuous*
- Weights of the suitcases of airline passengers on a specific flight *continuous*
- Votes received by mayoral candidates in a city election *Discrete*
- Number of students in the mathematics classes during the fall semester at your school for a particular school year *Discrete*
- Temperatures at a seashore resort *continuous*

For Exercises 23–30, classify each as nominal-level, ordinal-level, interval-level, or ratio-level measurement.

- 23. Telephone numbers *Nominal*
- 24. Leap years: . . . 2016, 2020, 2024, . . . *Interval*
- 25. Distances communication satellites in orbit are from Earth *Ratio*
- 26. Scores on a statistical final exam *Ratio*
- 27. Rating of cooked ribs at a rib cook-off *Ordinal*
- 28. Blood types—O, A, B, AB *Nominal*
- 29. Online spending in dollars *Ratio*
- 30. Horsepower of automobile engines *Ratio*

Exercises 1-3

For Exercises 5–10, define a population that may have been used and explain how the sample might have been selected.

5. Time magazine reported that 83% of people with household earnings over \$200,000 have a bachelor's degree.

Population: all people in USA earn more than 200,000
Choosing random sample of those people from Accounting firm record

6. Time magazine reported that 25% of the world's prisoners and prisons are in the United States.

Population: All world prisoners and prisons
sample to get the percentage of prisons in each country and USA

7. A researcher found that the average size of a household in the United States was 2.54 people.

8. Adults aged 19–50 need 1000 milligrams of calcium per day. (Source: Institute of Medicine Report)

9. Taking statins raises the risk of developing diabetes. (Source: Journal of American Medical Association and other sources)

7. Population: All household in USA

Sample: 1000 household Method: Census

8. All adults aged 19-50 in USA

sample may taken by studying groups taking different amount of calcium

9. Population: all adults in USA has diabetes

Sample: surveying diabetes patients to see if they taking statins before

10. The average January 2012 temperature in Boston was 34.2°F . This was 5.2° higher than the normal January average temperature. (Source: AccuWeather.com)

Population: all January 2012 temperatures
After recording All + emperatures in January, compared with the normal average

For Exercises 11–16, indentify the sampling method that was used.

11. To check the accuracy of a machine filling coffee cups, every fifth cup is selected, and the number of ounces of coffee is measured. *Systematic*
12. To determine how long people exercise, a researcher interviews 5 people selected from a yoga class, 5 people selected from a weight-lifting class, 5 people selected from an aerobics class, and 5 people from swimming classes. *Stratified*
13. In a large school district, a researcher numbers all the full-time teachers and then randomly selects 30 teachers to be interviewed. *Simple random*
14. In a medical research study, a researcher selects a hospital and interviews all the patients that day. *Cluster*
15. For 15 minutes, all customers entering a selected Wal-Mart store on a specific day are asked how many miles from the store they live. *Cluster*
16. Ten counties in Pennsylvania are randomly selected to determine the average county real estate tax that the residents pay. *Simple random*

Exercises 1-4

For Exercises 15–18, determine whether an observational study or an experimental study was used.

- 15.** A survey was taken to see how many times in a month a person encountered a panhandler on the street.

observational

- 16.** A study using college students was conducted to see if the percentage of males who pay for a date was equal to the percentage of females who pay for a date.

observational

- 17.** A study was done on two groups of overweight individuals. Group 1 was placed on a healthy, moderate diet. Group 2 was not given any diet instructions. After 1 month, the members were asked how many times they engaged in binge eating. The results of the two groups were compared.

Experimental

- 18.** Two groups of students were randomly selected. The students in Group 1 were enrolled in the general studies program. Group 2 students were enrolled in a specific major program (i.e., business, engineering, social work, criminal justice, etc.). At the end of the first year of study, the grade point averages of the two groups were compared.

observational

In Exercises 19–22, identify the independent variable and the dependent variable.

19. According to the *British Journal of Sports Medicine*, a regular 30-minute workout could slash your risk of catching a cold by 43%.

minutes of exercising: Independent

catching cold: dependent

20. The *Journal of Behavioral Medicine* reported that sharing a hug and holding hands can limit the physical effects of stress such as soaring heart rate and elevated blood pressure.

Hug and holding hands: Independent

stress: dependent

21. A study was conducted to determine whether when a restaurant server drew a happy face on the check, that would increase the amount of the tip.

happy face on check: Independent

amount of the tip: dependent

22. A study was conducted to determine if the marital status of an individual had any effect on the cause of death of the individual.

marital status: Independent

cause of death: dependent