Example

In 2016, pollsters correctly predicted that Clinton would win the popular vote.

However, state-level outcomes proved harder to predict and most pollsters failed to predict the outcome of the election.

Descriptive Statistics

We call *all voters* the population.

Def: A population is the collection of all individuals or items under consideration in a statistical study.

We call *the voters we collect data from* our sample.

Def: A sample is the part of the population from which information (data) is obtained.

Descriptive Statistics

Def: Descriptive statistics consists of methods for organizing and summarizing information.

These may include

- graphs
- charts
- tables
- various descriptive measures

Inferential Statistics

Def: Inferential statistics consists of methods for drawing and measuring the reliability of conclusions about a population based on information obtained from a sample of the population.

Descriptive vs Inferential

Def: Descriptive studies are designed to examine and explore information for its own intrinsic value only.

Def: Inferential studies use information from a sample to draw conclusions about a population.

Observational vs Experimental

Def: In an observational study, researchers observe characteristics and take measurements, as in a sample survey.

Def: In a designed experiment, researchers impose treatments and then take measurements to learn something about the effect of the treatments.

Observational vs Experimental

"Correlation is not causation."

Observational studies help reveal associations, while experiments can help establish causation.

Correlation vs Causation

Does ice cream cause crime?