

Brief Introduction to Public Health Data

Overview of Data Types



This handout offers a concise introduction to counts, percents, rates, and confidence intervals. Multiple types of data are often used together to describe cases or events of interest in a community.

Note: Different data definitions will lead to different results.

Count

- A count is the number of cases or events of interest.
- Examples include the number of people who tested positive for flu or number of visits to emergency departments.
- Counts are the simplest data type and are used in many quantitative measures, such as percents and rates.

$$\text{Count} = \text{number of events}$$

Percent

- A percent is the number of cases or events of interest relative to the size of the source group. The source group must include the events being counted.
- Percents are a type of proportion where the ratio is presented per 100%. A proportion could be presented as 1 in 2 or $\frac{1}{2}$ but a percent would be presented as 50%.
- Examples include the percent of kindergarten students who have received recommended vaccines or percent of emergency department visits that are related to an injury.

$$\text{Percent} = \frac{\text{number of events}}{\text{source group}} \times 100\%$$

Resources

[Describing Epidemiologic Data](#) from CDC
[Analyzing and Interpreting Data](#) from CDC

Rate

- A rate is number of cases or events of interest relative to the size of the source population during a specific time period.
- Rates are expressed per multiplier, usually per 1,000, 10,000, or 100,000.
- Adjusted rates mathematically remove the influence of selected biasing factors. Age-adjusted rates remove the influence of age on the rate. They should be used when the event of interest is related to age, such as deaths due to cancer.

$$\text{Rate} = \frac{\text{number of events}}{\text{source population}} \times \text{Multiplier}$$

during a specific time period

Confidence Interval

- Confidence intervals represent the uncertainty and precision of the data.
- The technical definition is complex, but confidence intervals can be interpreted to represent the range of values that are consistent with the data or the range where the real value is likely to fall.
- Wide confidence intervals suggest less precision, a smaller number of events, and a smaller population. Estimates with wide confidence intervals should be interpreted with caution.

[Descriptive Epidemiology](#) from Penn State
[Common Measures and Statistics in Epidemiological Literature](#) from UNC Chapel Hill