Understanding Numerators and Denominators

A guide to calculating proportion

Objectives:

- To understand what numerators and denominators are.
- To learn how to calculate proportions.
- To apply these concepts to real-world data.

Definitions:

- Numerator: the number on the top of the fraction.
- Denominator: the number on the bottom of the fraction.
- Example: If 10 people out of 100 have injected drugs in the past year, the numerator is 10 and the denominator is 100.

Importance of Numerators and Denominators

- Denominators let you know how many people have a certain characteristic of interest.
- Numerators let you know how many people are potentially at risk of having that certain characteristic of interest.
- A proportion is the denominator divided by the numerator. In English, this means the total number of people with the characteristic of interest out of the total number of people who could have it.

Real World Example: Injection Drug Use

- Calculating the proportion of people who have injected drugs in the past year.
    - (Number of people who injected drugs in the last year/total number of people who could have injected drugs in the last year or that are in your sample)
- What proportion of people smoke their drugs?
    - (Number of people who smoke drugs/total number of people who could smoke drugs or that are in your sample)
- Of people who inject drugs how many have ever shared a needle?
    - (Number of people who injected drugs who have shared a needle/number of people who inject drugs ever who have and have not shared a needle)

Limitations and Challenges:

- Measurement error: the difference between a measured quantity and its true value; includes random error and systematic error.
- Selection bias: a kind of error that occurs when the research decides who is going to be studied; it is usually associated with research where the selection of participants isn't random (i.e. with observational research such as cohort, case-control, and cross-sectional research).
- Missing data: occur when no data value is stored for certain variables or participants; data can go missing due to incomplete data entry, equipment malfunctions, lost files, and many other reasons.
- Small sample sizes: too small of a sample size reduces the power of the study and increases the margin of error.

Conclusion

- Summary of key takeaways numerators, denominators, and proportion are important and very useful!
- Important to make sure you have the right denominator for the numerator in question.
- Always be careful when interpreting your data and beware of potential reasons why your numbers may be misleading.

SHaRP: SUPPORTING HARM REDUCTION PROGRAMS
UNIVERSITY of WASHINGTON
School of Medicine