

Unit 3

- Essentially what type of study do you use in scenario.

Population vs. Sample

- A sample or survey can measure part of the population to conclude something about the population. When looking for answer about what a study proves ... taking a sample of population infers something about that specific population. When a survey covers whole population, it is fact and not something we are inferring. Samples! Only! generalize to population they came from.

Causation vs. Correlation

- Causation: is when one event IS the result of another event. Proved that one var controls another by experiment.
- Correlation: there is an observed correlation between variables through samples of observational study.

Experiments Design

Experimental units - Subjects given the treatments. Manipulated variable

factors - What experiment manipulates

Explanatory var - Var manipulated

Response var - outcome of treatments

Confounding Vars - Vars related to

exp var that can affect resp var. (Sometimes falsely)

Inferences through obs. study

Inferences are made on data collected, and deemed to be significant or insignificant.

Significant - able to infer some fact about data.

IDEA: Random + bias free samples = inference for larger population.

types of studies

• Experimental - assign treatment different ways:

• Randomly - randomly assign treatments to subjects. Good = repeatable, a control group, ^{limited} Confounding Vars.

• Block Designs - matches homogenous features to eliminate Conf Vars

• Matched Pairs - matches close characteristics in pairs to eliminate possible Confounding Vars. Each subject in pair randomly assigned to either the experiment or control group.

ex) two arms, one with sunscreen, one without.

• Randomized Block Design - Researcher divides subjects into homogeneous blocks, treatments randomly assigned to subjects in blocks
ex) Divide subjects into blocks with same skin color, randomly assign sunscreen vs. none.

• Use experiments to infer causation

• Observational study

• Random - HAT METHOD! Put names in hat, shake, draw, collect samples.

• Use the data to do different tests:

• Z-test uses proportions of categorical data, t-test uses #'s of numerical data. One sample for 1 var, 2 sample for different

• Use observational studies to infer correlation. } in variables.
Based on if data is significant from expected.