Stat 101L: Lecture 19

Observational Studies

- Simply observing what happens
  - A sample survey is an observational study.
  - There are other observational studies that are not surveys.

1

Tanning and Skin Cancer

- The observational study involved 1,500 people.
- Checked medical records to see if a person had experienced skin cancer or had never had skin cancer.
- Asked all participants whether they had used tanning beds.

2

Sodium and Blood Pressure

- Enroll 100 individuals in the study.
- Give them diet diaries where they record everything they eat each day for a month. From this the amount of sodium in the diet is found.
- Measure their blood pressure.

3

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Differences

- Retrospective – look at past records and historical data.
  - Tanning and Skin Cancer
- Prospective – identify subjects and collect data as events unfold.
  - Sodium and Blood Pressure

4

Experiments

- Explanatory variable – Factor.
- Treatments.
- Subjects – Participants – Experimental Units.
- Response variable.

5

Experiments

- The experimenter must actively and deliberately manipulate the factor(s) to establish the method of treatment. Experimental units are assigned at random to the treatments.

6

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Sodium and Blood Pressure

- 20 subjects.
- Factor – amount of dietary sodium.
- Treatments: low sodium diet and high sodium diet.
- 10 subjects randomly assigned to each treatment.
- Response – systolic blood pressure.

7

Experimental Principles

- Control
- Randomize
- Replicate
  - within an experiment.
  - repeating the entire experiment.
- Block

8

Control

- Control outside variables that may affect the response.
  - Have subjects of the same age, gender, general health, ethnic group.
  - By controlling outside variables you prevent those variables from causing variation in the response.

9