This work is licensed under a Creative Commons Attribution-NonCommercial-ShareAlike License. Your use of this material constitutes acceptance of that license and the conditions of use of materials on this site.

Copyright 2009, The Johns Hopkins University and John McGready. All rights reserved. Use of these materials permitted only in accordance with license rights granted. Materials provided "AS IS"; no representations or warranties provided. User assumes all responsibility for use, and all liability related thereto, and must independently review all materials for accuracy and efficacy. May contain materials owned by others. User is responsible for obtaining permissions for use from third parties as needed.

JOHNS HOPKINS
BLOOMBERG
SCHOOL of PUBLIC HEALTH

Lecture 4a: Practice Problem Solutions

John McGready
Johns Hopkins University

Practice: Paired Data?

1. Which of the following examples involve the comparison of paired data?
   - If so, on what are we pairing the data?

Practice: Paired Data?

a) In Baltimore, a real estate practice known as "flipping" has elicited concern from local and Federal government officials
   - "Flipping" occurs when a real estate investor buys a property for a low price, makes little or no improvement to the property, and then resells it quickly at a higher price
   - This practice has raised concern because the properties involved in "flipping" are generally in disrepair and the victims generally have low incomes
   - Fair housing advocates are launching a lawsuit against three real estate corporations accused of this practice

Practice: Paired Data?

a) In Baltimore, a real estate practice known as "flipping" has elicited concern from local and Federal government officials
   - As part of the suit, these advocates have collected data on all houses purchased by these three corporations which were sold in less than one year after they were purchased
   - Data were collected on the purchase price and the resale price for each of these properties
   - The data were collected to investigate whether the resale prices were, on average, higher than initial purchase price
   - A confidence interval was constructed for the average profit in these quick turnover sales

   - *This is a paired data scenario: each before price is connected to a specific after price, the unit of pairing is the house.*

Practice: Paired Data?

b) Researchers are testing a new blood pressure-reducing drug; participants in this study are randomized to either a drug group or a placebo group
   - Baseline blood pressure measurements are taken on both groups and another measurement is taken three months after the administration of the drug/placebo
   - Researchers are curious as to whether the drug is more effective in lowering blood pressure than the placebo

   - *This is an unpaired comparison ultimately. Paired difference are computed (after-before BP) for each subject in each group (drug or placebo) but the comparison of interest is the comparison of the differences between the two independent groups: drug and placebo.*

Practice: Paired Data?

c) Researchers are interested in the impact of a vegan diet on risk factors for coronary heart disease (CHD) in subjects with a family history of such CHD. Researchers randomly select 100 such families with more than one child and randomize two siblings from each family to either a vegan diet or an omnivorous diet (one sibling on each diet). These diets, prescribed by a nutritionist, are to last for six weeks.

- Baseline CHD risk factor measurements are taken (BP, cholesterol level, percent body fat) on each participant
- Follow-up CHD risk factor measurements are taken at the end of the 6-week diet period
- Changes in risk-fact levels are to be compared between those on the vegan diet and those on the omnivorous diet

Practice: Paired Data?

c) Researchers are interested in the impact of a vegan diet on risk factors for coronary heart disease (CHD) in subjects with a family history of such CHD. Researchers randomly select 100 such families with more than one child and randomize two siblings from each family to either a vegan diet or an omnivorous diet (one sibling on each diet). These diets, prescribed by a nutritionist, are to last for six weeks.

- This is a paired comparison (of paired differences)
- The change in cholesterol is computed for each subject in the study and these changes are compared between the two diet groups
- But each subject in the vegan group is matched with his/her sibling in the omnivorous group: so the diet group comparison is paired by sibling