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Lecture 4a: Practice Problem Solutions

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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 differences 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-factor 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*