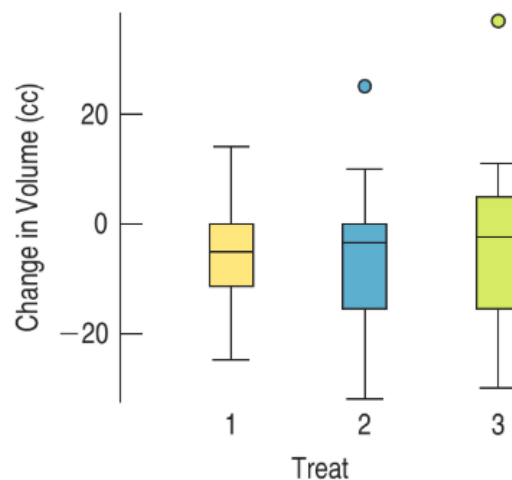


Practice IRAT 26 October (experiments, especially RCTs)

1. Exercise 21 on page 337.
2. Exercise 35 on page 338.
3. Which of the following approaches can help researchers to reduce bias in a randomized controlled trial?
 - a. Using placebos to blind participants as to which group they are in.
 - b. Blinding observers or experimenters about group assignments.
 - c. Randomly assigning participants to each group.
 - d. All of the above.
4. A team of researchers wanted to examine if contrast baths are effective for patients with Carpal Tunnel Syndrome. Contrast bath treatments use the immersion of an injured limb alternately in water of two contrasting temperatures. Those who use the method claim that it can reduce swelling. Researchers compared 3 treatments: (1) contrast baths and exercise, (2) contrast baths alone, and (3) exercise alone. They report the following boxplots comparing the change in hand volume (i.e., amount of de-swelling) after treatment:



Which of the following **best** describes his finding?

- a. The “contrast baths and exercise” treatment is the most effective because it has the greatest median change in volume.
- b. The “exercise alone” condition is the least effective because it has the largest spread in volume change.
- c. The three treatments likely do not meaningfully differ in their effectiveness at reducing swelling.
- d. The “contrast baths alone” treatment is the most effective because the fences of the boxplot indicate a greater change in volume compared to other treatments.

Practice IRAT 26 October (experiments, especially RCTs)

5. Suppose you have recruited a sample of people to participate in a randomized controlled trial. Each person is represented by an integer between 1 and 100. Which of the following commands in R would randomly assign half of the participants to a control group and the other half to a study group?

- a. `control <- sample(1:100, size = 50, replace = TRUE)`
`study <- sample(1:100, size = 50, replace = TRUE)`
- b. `control <- sample(1:100, size = 50)`
`study <- sample(1:100, size = 50)`
- c. `shuffled <- sample(1:100, size = 100, replace = TRUE)`
`control <- shuffled[1:50]`
`study <- shuffled[51:100]`
- d. `shuffled <- sample(1:100, size = 100)`
`control <- shuffled[1:50]`
`study <- shuffled[51:100]`

Answers:

3. D. Each method is an important one for reducing bias.

4. C. To quote the textbook: “The variation within the treatment swamps the difference between the medians”. The differences aren’t large or reliable, so we would have little confidence that they hold up in the population to which we’d like to generalize.

5. D. Replacing items will not work, as then you could (and likely would) have the same participant assigned to a group multiple times. Other participants would then not be assigned to either group. A and B will not work for a similar reason: You could (and likely would) have individuals who were assigned to both groups, whereas others would be assigned to none.