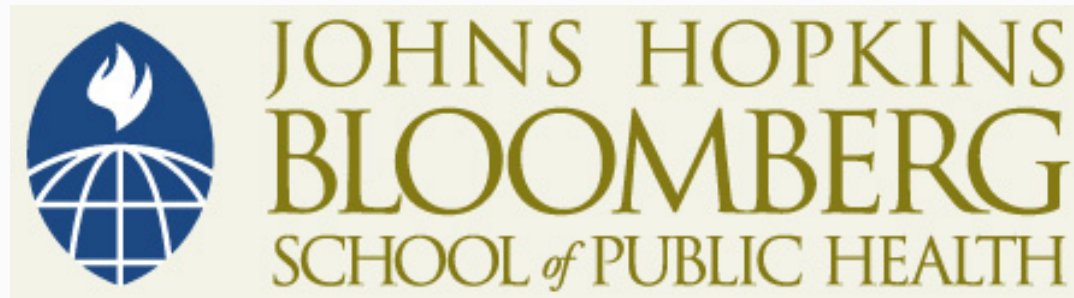


This work is licensed under a [Creative Commons Attribution-NonCommercial-ShareAlike License](https://creativecommons.org/licenses/by-nc-sa/4.0/). Your use of this material constitutes acceptance of that license and the conditions of use of materials on this site.



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 5a: Practice Problem Solutions

John McGready
Johns Hopkins University

Practice Problems

1. In a high school in the United States, a dietary counseling is being tested to measure the program's long-term impact on student's fat intake. Of the three hundred students at the school, 150 are randomized to receive five one-hour sessions of dietary counseling; the other 150 students receive no counseling.
 - Six months after the last counseling sessions, all students are asked to keep a food diary for one week. Each student's average fat intake in grams, is calculated at the end of this week. The results of this exercise are as follows:

Practice Problems

- Intervention group
 - $\bar{x}_1 = 54.8$ grams , $s_1 = 28.1$ grams, $n_1 = 146$
- Control group
 - $\bar{x}_2 = 62.8$ grams, $s_2 = 34.7$ grams, $n_2 = 142$
 - (Please note—follow up sample sizes differ slightly from initial sample size because of loss to follow up)
- The public-health question of interest is whether there is a difference in mean fat intake between the two groups, six months after the intervention ended. You are going to help answer this question:
 - Construct a 95% CI for the population mean difference in daily fat intake for the intervention group as compared to the control group.

Practice Problem Solutions

- To create a 95% CI for $\mu_2 - \mu_1$:

$$\begin{aligned} & (\bar{x}_2 - \bar{x}_1) \pm 2 \times S\hat{E}(\bar{x}_2 - \bar{x}_1) \\ & (62.8 - 54.8) \pm 2 \times S\hat{E}(\bar{x}_2 - \bar{x}_1) \\ & 8.0 \pm 2 \times S\hat{E}(\bar{x}_2 - \bar{x}_1) \end{aligned}$$

$$\begin{aligned} S\hat{E}(\bar{x}_2 - \bar{x}_1) &= \sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}} \\ &= \sqrt{\frac{(28.1)^2}{146} + \frac{(34.7)^2}{142}} \approx 3.7 \end{aligned}$$

- Business as usual!!

Practice Problem Solutions

- 95% CI for $\mu_2 - \mu_1$:
 - $8 \pm 2 \times (3.7)$
 - 8 ± 7.4
 - (0.6gm, 15.4 gm)
 - Notice that 0 is not included in the 95% CI