

Quiz 2:

1. There are three studies on the effect of glucosamine on bone density. The first experiment uses a historical control and shows a large increase in bone density for the treatment group. The second study uses randomised assignment, and a placebo is given to the control group. No increase in bone density is observed in the treatment group after one year. The third one is a cohort study which controls for age, race, sex, social economic status and food habits. This study also observes the bone density of the treatment group is higher than for the control group. Choose the best option.

- A) Glucosamine is likely effective as 2 out of 3 studies support this conclusion.
- B) Glucosamine is likely effective because of the results from the cohort study where confounders are controlled for.
- C) Glucosamine is likely not effective because of the results from the randomised controlled experiment.

Explanation:

To study causal relationships, randomised controlled experiments are more reliable than historically controlled experiments and observational studies. The latter are prone to confounding.

2. In unit 8 slide 4 of chapter 1, the statement “attitude to health seems to be a confounder” is fully justified by

- I. Percentage of people with good attitude among adherers is different from the percentage of people with good attitude among non-adherers.
- II. Percentage of deaths among adherers is different from the percentage of deaths among non-adherers.
- III. Percentage of deaths among people with good attitude is different from the percentage of deaths among people with bad attitude.

- A) I only.
- B) II only.
- C) III only.
- D) I and II only.
- E) I and III only.
- F) II and III only.

Explanation: Confounder is a third variable which is associated with both exposure and outcome. In this context, adherence is exposure and death is outcome. For attitude to health to be a confounder, it needs to be associated with both, adherence and death. (I) shows an association between exposure and attitude. (II) shows the association between the exposure and outcome. (III) shows the association between attitude to health and outcome. As such, I & III justify attitude towards health to be a confounder.

3. This question refers to unit 9 slide 4. Consider the following statements.

- I. For departments A and B combined, the admission rate for men is lower than the admission rate for women.
 - II. For departments B and F combined, the admission rate for men is lower than the admission rate for women.
- A) Both I and II are true.
B) Only I is true.
C) Only II is true.
D) Both I and II are false.

Explanation: The combined admission rates are weighted averages (chapter 1 unit 9):

$$\text{Rate for men (A\&B)} = (825 \times 62\% + 560 \times 63\%) / (825 + 560) = 62\%$$

$$\text{Rate for women (A\&B)} = (108 \times 82\% + 25 \times 68\%) / (25 + 108) = 79\%$$

$$\text{Rate for men (B\&F)} = (373 \times 6\% + 560 \times 63\%) / (373 + 560) = 40\%$$

$$\text{Rate for women (B\&F)} = (25 \times 68\% + 341 \times 7\%) / (25 + 341) = 11\%$$

There is an easier way also:

When combining A and B, the resultant rate for men should be between 62% and 63%. Similarly for women, the resultant rate should be between 68% and 82%. As such, without calculation, the admission rate for men should be lower.

When combining B and F and for women, F is much larger than B (341 vs 25) so the resultant rate should be near to 7%. For men on the other hand, B is larger than F (560 vs 373) and the resultant rate should be nearer to 63%.

4. From the population tabled in unit 10 slide 2, half the diabetic people and one-tenth (10%) of the healthy people are randomly chosen. The fraction of diabetic patients among the males in the sample is likely ____ 0.25.

- A) less than
- B) equal to
- C) more than

Explanation: In this sample we have:

	diabetic	healthy	Total
male	26000	15600	41600

$$\text{Rate (diabetes | male)} = 26000 / 41600 = 62.5\%$$

5.

	Male	Female
Asian blush	150	50
No Asian blush	35	251

Suppose that 185 males and 301 females are checked for the presence “Asian blush”. The result is shown in the table. What is the risk ratio of Asian blush between males and females?

- A) $150/(150+50)$
- B) $150/(150+35)$
- C) $(150 \times 251)/(50 \times 35)$
- D) $(150 \times (35+251))/(35 \times (150+50))$
- E) $(150 \times (50+251))/(50 \times (150+35))$

Explanation:

$$RR = \frac{R(\text{Asian blush} \mid \text{male})}{R(\text{Asian blush} \mid \text{female})} = \frac{\frac{150}{150 + 35}}{\frac{50}{50 + 251}}$$