

6.1

1/1 point (graded)

Which conditions need to be satisfied for treatment-control balance? Select all that apply.

☐ $E[Y_1|X = 1] = E[Y_1|X = 0]$

✓

☐ $E[Y_1|X = 1] = E[Y_0|X = 0]$

☐ $E[Y_0|X = 1] = E[Y_0|X = 0]$

✓

☐ $E[Y_0|X = 1] = E[Y_1|X = 0]$

Explanation
Treatment-control balance means the counterfactual outcomes are comparable for treatment and control groups. In other words, the expected potential outcomes if treated for the two groups are the same, and so are the expected potential outcomes if not treated.

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6.2

2/2 points (graded)

Fill in the blanks. $E[\cdot]$ is the

expectation

 ✓ Answer: expectation operator denoting the

mean

 ✓ Answer: mean of a random variable.

Explanation
 $E[\cdot]$ is the expectation operator denoting the mean of a random variable. We use $E[\cdot]$ to represent the expected value for a population.

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6.3

2/2 points (graded)

Fill in the blanks. $E[Y_0|X = 1]$ denotes the expected potential outcome if

not treated

 ✓ Answer: not treated for those who are

treated

 ✓ Answer: treated .

Explanation
 $E[\cdot | \text{condition}]$ denotes the expected value of a random variable in cases where the condition is true. Y_0 and Y_1 denote the potential outcome if not treated and the potential outcome if treated, respectively. $X = 1$ denotes the group that received the treatment (i.e., the treatment group) and $X = 0$ denotes the group that did not receive the treatment (i.e., the control group).

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Answers are displayed within the problem

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