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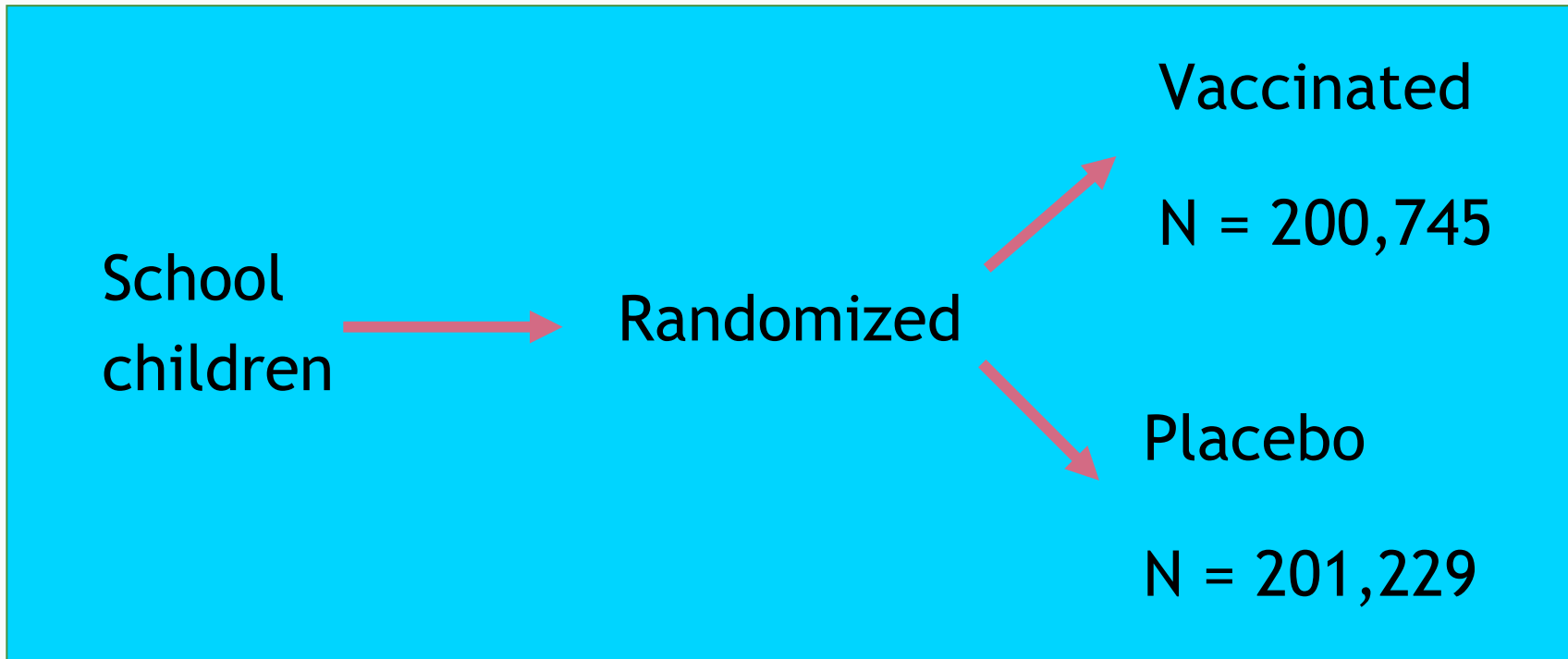
## Lecture 10a: Practice Problem Solutions

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# Practice Problems

2. Consider a large, randomized study such as the Salk polio vaccine trial



## Practice Problems

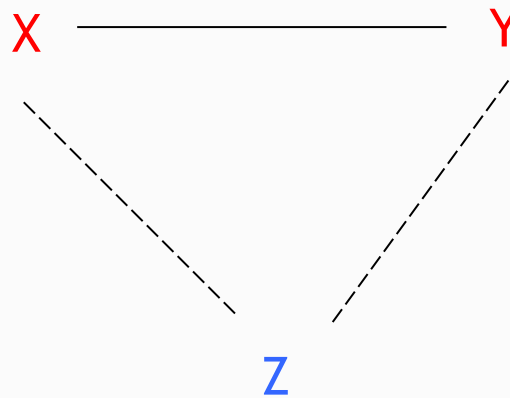
2. How does randomization help to ensure that the outcome/treatment group relationship observed is not confounded by any factors known or unknown? More specifically, what part of the necessary conditions for confounding does randomization eliminate?

# Practice Problems

- Remember, a necessary condition for a variable to be a confounder is that it must be related to both the outcome and the predictor of interest
- In randomized studies, the “treatment” is the predictor of interest
- Randomization with a large number of potential subjects eliminates the association between the predictor of interest and any other variable besides (potentially) the outcome
- In other words, randomization allows the only difference between the “treatment” groups to be the treatment of interest

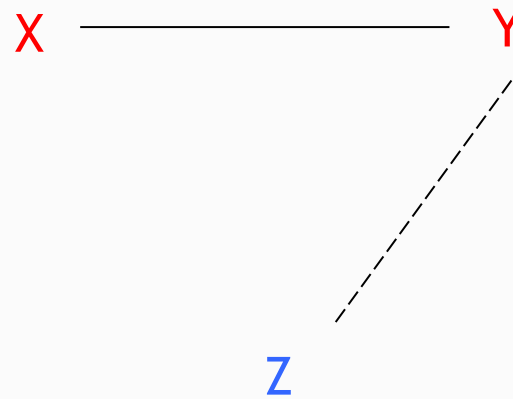
# Practice Problems

- In the “confounding conditions” diagram with outcome  $Y$ , predictor of interest  $X$ , and potential confounder  $Z$ :



# Practice Problems

- Randomization eliminates the necessary link between X and Z



## Practice Problems

3. Suppose a study were performed to assess the relationship between a diet choice (vegan, lacto-ovo vegetarian, neither) and cholesterol level. Subjects were not randomized to a dietary group. Before interpreting the relationship, can you name some potential factors for which it would be advisable to control?



# Solutions

- Remember, for a factor to be a confounder, it must be associated with both cholesterol level and with being vegetarian

# Solutions

- Some candidates include the following:
  - Sex—females are more likely to be vegetarian and have lower cholesterol
  - Smoking—vegetarians are less likely to smoke and smoking is associated with higher cholesterol
  - Income—vegetarians are wealthier and increased wealth associated with lower cholesterol