

6-Part Webinar Series: Research Methodology

Part III: Confounding

Questions Asked: 14 March, 2024

1. To say a variable is a confounder, one criterion is it must not be in the causal pathway. What do we mean by the term causal pathway?

A confounder should NOT be a cause of the outcome.

2. Please tell us how to "easily" find the third quality of a confounder, i.e., one that is not involved in the causal pathway.

From the known of a factor – is the factor a cause for the outcome, basically – the outcome does NOT occur without the factor occurring.

3. Could you identify potential confounders at an early stage?

Typically – age, race and gender are confounders for many outcomes. For example – African Americans have an excess risk of stroke and hypertension at younger ages.

4. What can we do to control confounding during sampling before the start of the study?

Several approaches. A randomized selection can work. Also a stratified target can also help address confounding.

5. Is confounding a bias? If yes, will I be right to mention that there are three major groups of bias, including information, selection bias, and confounding?

Confounding can function as a bias as suggested.

6. What are common confounding variables that researchers need to consider in cross-sectional studies?

Certainly there are multiple factors but age, race and gender are often considered, as well as indicators of socio-economic status.

7. Can an effect modifier be a confounder and vice versa?

Typically – an effect modifier is different from the confounder effect.

8. Can you compare the confounding with interaction?

Often interaction can be analyzed on consideration of confounding.

9. What are the differences between a confounder and an effect modifier?

The main difference is based on the assignment of treatment with confounding dependent on how treatment was assigned, where effect modification does not. Both are however relative to a

population of study. A variable might serve as a confounder for a cohort design of one population but not serve as a confounder for a cohort design of another population.

10. How does one disentangle age as both a confounder and an effect modifier?

In many studies, age is considered a potential confounder. Age is strongly associated with end points of interest in epidemiology (diseases, physiological characteristics, treatment, etc). To consider age as a confounder it must be associated with the exposure under study. Age is a confounding factor because it is associated with the exposure (meaning that older people are more likely to be at higher risk), and it is also associated with the outcome (because older people are at greater risk of developing disease).

11. How can cumulative exposure over time within age subgroups be accounted for?

The total amount of a substance or factor that a person is exposed to over time. Cumulative exposure to a harmful substance or factor may increase the risk of certain diseases or conditions. Cumulative and aggregate exposure assessments are referred to as "combined exposure assessments" because cumulative assessments estimate exposure to multiple stressors by multiple routes. Aggregate assessments estimate exposures to a single agent from multiple sources and by multiple routes.

12. What percentage difference suggests the presence of confounding?

It depends on the variable or parameter, as well as the population.

13. How do we know if the confounder variable is associated with the exposure or outcome? Do we need to do a binary regression or correlation analysis first?

The strength of the association would be a determinant and can be assessed by regression and/or correlation analysis.

14. Can you specify the method to deal with confounding in data analysis?

Several statistical analyses consider confounding including regression analyses. As well stratification is another way to address the assessment of confounding.

15. I wanted to know what specific statistical techniques there are to identify confounding factors in a study.

A useful way to identify confounding is to calculate the crude (unadjusted) measure of association and then compute the measure of association again after adjusting for a possible confounding factor, as we did above. If the two differ, it suggests that the factor we adjusted for was a confounder.

16. Does the logistic regression give us the adjusted odds ratio between the main exposure under study and the outcome, eliminating the effect of confounding?

Yes – and "adjusting" for confounding.

17. How do you see including variables only with a p-value of above 0.25 or 0.20 to multivariable regression? Or do we need to include known confounders despite the p-value?

It depends on the strength of the association between the specific parameter and outcome, as well as the population. If the confounder is well established for other studies – this could be used.

18. If I am doing a study on the effect of injection drug use on the incidence of HCV among HIV cases, would the potential confounders of this study be other risky behaviors (men who have sex with men, commercial sex workers, and having sex with multiple partners)?

It could be depending on the strength of the confounder.

19. Is stratification by location good enough to control for confounding, such as rural and urban background, when conducting research to evaluate factors affecting an intervention for a disease like malaria or cholera?

It could be adequate depending on the other potential confounders.

20. About Poll question 2, these are not comparable populations at all. How will we adjust for the temperature?

It would depend on the strength of the association of the other parameters.

Others:

1. How do we submit abstracts? [For the 6th World Hypertension Congress]

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2. Is it possible for Professor Dan and Michael to accept an invitation to be the external reviewers for the dissertation (PhD) defense? It is a requirement for the chair of the supervisor to find external reviewers from another country.

Certainly pleased to help as time allows. Probably best to select a local mentor for the chair.