

Session 8: Stratified Contingency Tables

Exercises

Question 1

Compute χ^2 and the estimated odds ratio (OR) for the AMI paired binary data dataset.

		Disease Status		TOTAL
		AMI	no AMI	
Exposure Status	Carrier	96	87	183
	Noncarrier	117	126	243
TOTAL		213	213	426

Question 2

For each situation below, decide whether the indicated variable is an example of *confounding* or *effect modification*.

- a) Two hospitals are compared using the rate of deaths following a particular type of surgery. In the data below, we've stratified the death rate by *risk group*.

Is *risk group* a confounder or effect modifier?

		Death rate
High risk		
Hospital	A	57/1500 (3.8%)
	B	8/20 (4.0%)

Low risk		
Hospital	A	6/600 (1.0%)
	B	8/600 (1.3%)

- b) "Researchers at the International Agency for Research on Cancer in France found that women infected with both HPV and HSV-2 were nearly three times more likely to get cervical cancer compared to women with only HPV infection."

Does HSV-2 confound or modify the effect of HPV on cervical cancer?

Exercises

- c) "If the mother took antidepressant medication during the first trimester, without accounting for other possible influences, children had roughly twice the risk of having autism. The researchers then compared siblings in families where the mother used antidepressants in one pregnancy but not the other. This helped account for all of the factors that make siblings similar — their shared genetics and environment. In the sibling matchup, the children had essentially the same risk for autism, ADHD and poor fetal growth whether they were exposed to antidepressants in the womb or not."

Do genetic factors confound or modify the effect of antidepressants on autism?

Question 3

Based on the abundance of specific bacterial genera, the human gut microbiota can be divided into two relatively stable groups (enterotypes) that might play a role in personalized nutrition. These simplified enterotypes were studied as prognostic markers for successful body fat loss on two different diets.

A total of 62 participants with increased waist circumference were randomly assigned to receive a New Nordic Diet (NND) high in fiber/wholegrain or an Average Danish Diet (ADD) for 26 weeks.

- At enrollment, participants were grouped into two discrete enterotypes by their relative abundance of *Prevotella* spp¹ divided by *Bacteroides* spp. (P/B ratio) obtained by quantitative PCR analysis.
- Among individuals with high P/B the NND resulted in a 3.15 kg larger body fat loss compared to ADD whereas virtually no difference (0.88 kg) was observed among individuals with low P/B. Consequently, a 2.27 kg difference in responsiveness to the diets were found between the high and low P/B groups.

In summary, subjects with high P/B-ratio appeared more susceptible to lose body fat on diets high in fiber and wholegrain than subjects with a low P/B-ratio.

- a) Which of the following best describes the design of this study?
- Cross-sectional survey
 - Case-control study
 - Prospective cohort
- b) For each of the following variables, identify its role in the above research study. The role should be chosen from amongst the following terms: *Outcome*, *Exposure*, *Effect modifier*, *Confounder*
- diet
 - weight loss
 - P/B ratio

¹ spp. stands for *species pluralis*, the Latin for "multiple species".