

BE.104 Spring '05
Problem Set 2
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1. After visiting each household in their defined public health sector (A) during the months of July-August, your team of healthcare monitors documents 40 cases of an unusual skin rash associated with headaches. Sector A is comprised of 500 households located in one section of the city of Boston.

What information does your team need so that they can develop estimates of the prevalence and incidence of skin rashes in sector A?

2. The team leader for sector B calls you because you are team leader of sector A. The B leader wants to know if your team has observed any case of an unusual skin rash associated with headaches. Leader B reports that they have observed 60 cases in their 1000 households. You both also relate that 95% of the observed cases are children.

What information do you need to determine whether your sector has a greater problem than sector B?

3. Further investigation reveals that the rash/headache illness in sectors A and B last for only three days. What feature of your data would you evaluate to determine the current state of this epidemics progression?

4. Based on your teams astute observations, you recognize that kids who drink from playground fountains show an increased incidence of the illness. You develop a test to identify kids who are at risk because of this activity. From national surveys or childhood behavior, you learn that for kids who always drink water at playgrounds, 80% will visit the playground ≥ 3 days a week; and for kids who never drink playground water, 80% never go to the park more than 3 days a week.

Design the highest quality test for detecting kids exposed to playground water based on asking kids (or their parents) how many days they go to the playground each week.

Determine the following properties of your test:

Sensitivity

Specificity

Positive Predictive Value

Negative Predictive Value

5. Using your test, you discover that of the kids affected in the two sectors, 15 tested as no exposure to playground water. The total number of kids in the two sectors is 1115. Based on a sample of 200, you estimate that unaffected kids are equally likely to have been exposed or not exposed to playground drinking water.

What is the relative risk for the illness with respect to drinking playground water?

What is the odds ratio?

6. How much of the risk of skin rash/headache in kids in these communities can be attributed to their drinking playground water?

Given that this is a “new illness,” how do you explain the fraction that is not attributable to drinking playground water?