Notes

Let A be an individual characteristic in a population with 0 < rate(A) < 1, i.e., some people have A, but not all. Let B be another characteristic in the same population, with 0 < rate(B) < 1.

1. Let rate(A | B) be the rate of A among people with characteristic B. rate(A | not B), etc., are similarly defined.
2. A and B are associated if rate(A | B) is different from rate(A | not B), or if rate(B | A) is different from rate(B | not A).
3. rate(B) always lies between rate(B | A) and rate(B | not A). The closer rate(A) is to 100%, the closer rate(B) is to rate(B | A).
4. The odds of A among people with characteristic B is defined by

$$\text{odds}(\text{A} \mid \text{B}) = \frac{\text{rate}(\text{A} \mid \text{B})}{1 - \text{rate}(\text{A} \mid \text{B})}$$

5. The odds ratio of A between people with B and people with "not B" is

$$\frac{\text{odds}(\text{A} \mid \text{B})}{\text{odds}(\text{A} \mid \text{not B})}$$

6. Suppose the population is classified as shown below, i.e., there are w persons with characteristics A and B, x persons with characteristics A and not B, etc.

	B	not B
A	w	x
not A	y	z

   Then the odds ratio of A between people with B and people with "not B" is

$$\frac{\text{wz}}{\text{xy}}$$

7. In measuring a fixed unknown quantity, we have

   measurement = true value + systematic error + random error

8. For a diagnostic test, the sensitivity is the rate of positive test result among those who have the disease, and the specificity is the rate of negative test result among those who do not have the disease.