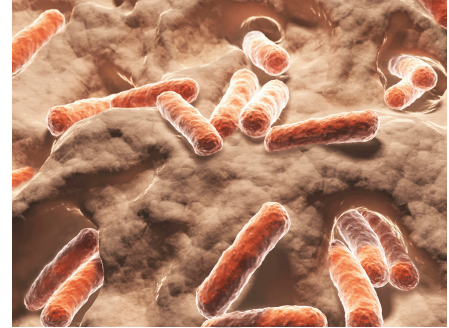


Lesson 15, Part D, Do you trust the test? (continued)

Theme: Risk Assessment

Doctors diagnose symptoms, but they also rely on medical tests to confirm their diagnosis. Unfortunately, medical tests involve some chance of error. In some cases, patients test positive for a disease that they do not have. In other cases, the patient has the disease but tests negative. In this lesson, you will evaluate the accuracy of the test from the previous lesson.



Credit: Thinkstock

Objectives for the lesson

You will understand that:

- A percent can be used to express the likelihood (or probability) of a certain event.
- Selecting the correct comparison value and base value is important in calculating percentages.
- Evaluating the accuracy of a test can depend on what data you focus on.

You will be able to:

- Extract relevant information from a two-way table.
- Select the appropriate values to calculate probabilities.
- Calculate and interpret probabilities of errors: percent of positive results that are false positives and percent negative results that are false negatives.

Refer to this table from Lesson 15, Part C.

Causes of Sore Throat in Patients

| | Sore Throat Patients with Streptococcal Infection | Sore Throat Patients with Other Infections/Causes | Total |
|----------------------|--|--|--------------|
| Positive test result | 96 | 19 | 115 |
| Negative test result | 24 | 361 | 385 |
| Total | 120 | 380 | 500 |

- 1) Think about the patients with a Streptococcal infection who received a negative test result. These test results are **false negatives**. How many false negatives appear in the table?
- 2) A patient receives a negative result on the test for strep throat. What is the chance—rounded to the nearest tenth of a percent—that this negative result is a false negative?
- 3) What do you think a **false positive test result** means? How many patients in the table received a false positive result?
- 4) A doctor finds that a patient gets a positive result on the test.
Part A: Knowing that the patient's test is positive, what is the approximate chance the result is a false positive?
Part B: How should the doctor think about this percentage? What should the doctor do with this information?
- 5) You can use different percentages to describe the accuracy of a test. A test is **accurate** when it results in a low percent of errors (**false positives** and **false negatives**). Pick one figure or percentage that you think best describes the accuracy of the test. Explain what this figure says about the test and why you picked this figure.
- 6) Now, think about how to use a figure or percentage to describe the degree to which the test is **inaccurate**. A test is inaccurate when it results in high rates of errors (**false positives** and **false negatives**). Pick one figure to describe the inaccuracy of the test. Explain what this figure says about the test and why you picked this figure.