

Some Useful Resources about the Issue of False Positives

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The sites below discuss the issue of false positives in various medical tests. A "false positive" is a result that shows a person has the characteristic--when in fact he doesn't. Most people have a poor understanding of how this happens. They hear that a test is 99% accurate and assume that means the results are accurate. The problem occurs because there are two percents that need to be considered: the accuracy of the test and the incidence of the characteristic in the population being tested. These sites discuss the problem as well as giving examples using contingency tables. It should be easy to develop a classroom set of questions from these sites. A 2x2 table is very useful:

	Healthy	Sick	Total
Test Healthy			
Test Sick			
Total			

The issue of false positives can be looked at using other topics such as lie detectors, tests for cancer, drug testing, etc. Information would be needed on the rate of occurrence in the population of interest as well as the accuracy of the tests. Interesting "what ifs" can be explored by changing either of the percents. For example if testing for HIV in a population where it occurs 20% of the time rather than 1% will have a dramatic effect on the number of false positives.

There is an article on this topic in the NCTM (National Council of Teachers of Mathematics) Addendum Series book "Dealing with Data and Chance" at the beginning of Chapter 4 (see <http://my.nctm.org/store/ECat/product.asp?id=463> for ordering information). "On the Shoulders of Giants" edited by Lynn Steen (Mathematical Sciences Education Board, National Research Council, Washington DC; Publisher: National Academy Press, 1990) also has a chapter devoted to this topic.

Three web-sites

<http://www.skeptics.org.nz/SK:VIEWARTICLE:1001.7019:waDeptTOC.1,A1177>

This is a good article on the occurrence of false positives and the difficulty people have in interpreting the meaning. There is a clear explanation with examples.

<http://www.acad.sunyccc.edu/instruct/sbrown/stat/falsepos.htm>

This site uses the John Paulos example from A Mathematician Reads the Newspaper (Doubleday Publishing (New York, New York, USA), 224 pages. Price: US\$ 12.95) to help us understand false positives.

<http://www.anselm.edu/homepage/jpitocch/biostats/medtermsbiost.html>

This is a third example explaining false positives.