

KEY

New Exercises for Chapter 10

10.11. The "HIV screening case study" presented in class was used to introduce population-based screening concepts. It is, however, out of date in terms of the sensitivity and specificity specifications of the screening test. Now, an oral salivary test is often used. According to the manufacturer of a commonly used salivary test (OraQuick®, OraSure Technologies, Inc.), this screening tool has a sensitivity of 99.3% and specificity of 99.8% (CDC, 2004).

KEY

ANSWERS EMBEDDED AS COMMENTS

✓
2/
3/

- (a) In plain terms, what does a sensitivity of 99.3% mean in the context of this test?
99.3% WITH DISEASE TEST POSITIVE
- (b) In plain terms, what does the specificity of 99.8% mean?
99.8% OF THOSE DISEASE-FREE TEST NEGATIVE
- (c) The OraQuick® screening test will be used in a population of 1 million people in which the prevalence of HIV is 0.1% (0.001). Fill in this 2-by-2 table with the expected number of TPs, TNs, FPs, and FNs under these circumstances.

Comment [BBG1]: ANS: This means that the test correctly identifies 99.3% of people who are affected with HIV.

Comment [BBG2]: ANS: This means that the test correctly identifies 99.8% of people who are HIV free.

	Disease +	Disease -	Total
Test +	993	1998	2991
Test -	7	997,002	997,009
Total	1,000	999,000	1,000,000

Comment [BBG3]: [... \[1\]](#)
CLICK HERE

✓

- (d) What is the predictive value of a positive test under these circumstances? Report the results as a percentage with one decimal place accuracy.
33.2%

Comment [BBG4]: ANS: PVPT = 993 / 2991 = .332 = 33.2%.

✓

- (e) Would you trust a positive test result in this population? Why or why not. (Address the meaning of the calculated PVPT in plain terms.)
OBVIOUSLY NOT... 73% WILL BE FALSE POSITIVES

Comment [BBG5]: ANS: No, I would not trust the results because only 33.2% of the positive tests represent people who truly have HIV.

✓

- (f) What is the predictive value of a negative test under these circumstances? Report the results as a percentage with one decimal place accuracy.
100.0%

Comment [BBG6]: ANS: PVNT = 997,002 / 997,009 = .999 = 100.0%.

✓

- (g) How would you increase the predictive value of this test?
~~RETESTING WITH MORE SPECIFIC TEST~~

Comment [BBG7]: Follow up positive results with a more specific test.

✓

- (h) Would you trust a negative test result under these circumstances? Why or why not?
YES → 100% ACCURATE

Comment [BBG8]: ANS: Yes, I would trust the results because virtually 100% of the negative tests represent people without HIV.

99 ✓ → FRLC