

# False-Positive HIV Test Results

## False-Positive Results and Specificity

When a person is not infected with HIV but receives a positive test result, that result is considered a false positive. Generally, HIV tests have high specificity, meaning that there are few false-positive results and most uninfected individuals are classified as uninfected by the test. If 1,000 uninfected people are tested with an HIV test and 4 have false-positive results, the HIV test's specificity is 99.6% (996 true negative test results/1,000 HIV uninfected persons tested).

## Causes of False-Positive HIV Test Results

False-positive test results can occur due to technical issues associated with the test or biological causes. Technical issues include specimen mix-up, mislabeling, improper handling, and misinterpretation of a visually read rapid test result. Biological causes include participation in an HIV vaccine study, autoimmune disorders and other medical conditions.<sup>1-5</sup>

## Additional Testing to Distinguish True Positive from False Positive

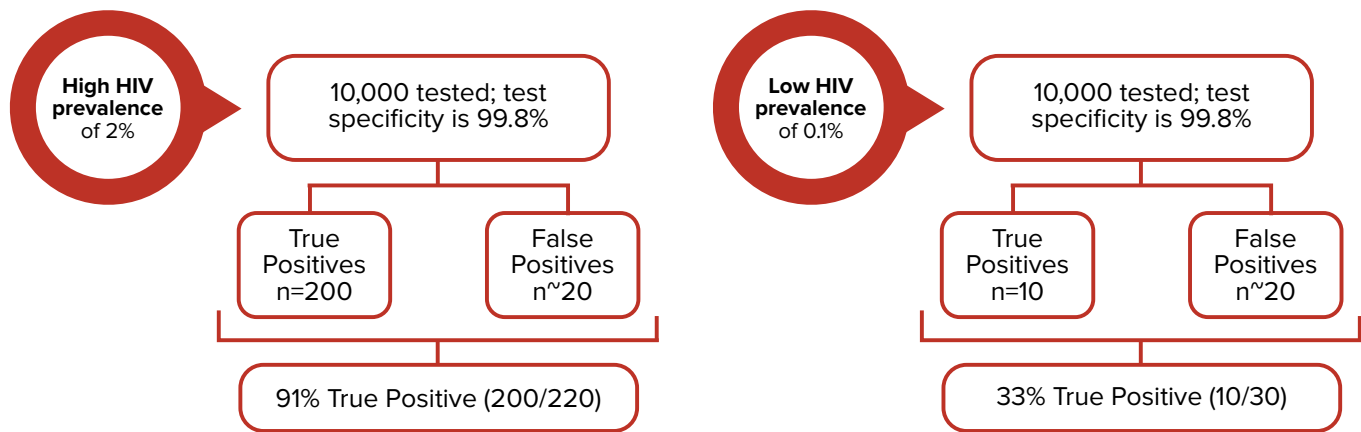
When a screening test is positive, additional testing is needed to determine if the positive result was accurate or whether the screening test result was falsely positive. If the screening test was a laboratory test, additional testing will generally occur using the original specimen.<sup>1,6</sup> If it was a rapid test, additional testing may occur in one of three ways: by submitting a specimen to the laboratory, by conducting a rapid test algorithm (i.e., rapid tests from different test manufacturers in sequence), or by referring the individual to a healthcare provider who can conduct additional testing.<sup>7,8</sup> If a rapid test algorithm is conducted and the initial test is reactive, but the subsequent test is not, additional testing in a laboratory is needed to rule out an early infection.<sup>7</sup>

## Impact of HIV Prevalence

HIV prevalence is the proportion of a population living with HIV infection. HIV prevalence within a population tested influences how many false-positive results there are relative to true-positive results.

*High prevalence:* If you test 10,000 specimens and HIV prevalence is high (2%), 200 specimens will be from persons who are infected with HIV (true-positive) and 9,800 will be from persons who are not infected with HIV. If test specificity is 99.8%, results for approximately 20 specimens will be false-positive. In this case, of the 220 with positive results (200 true-positives plus 20 false-positives), 91% are actually infected with HIV. The number of true positives far exceeds the number of false positives.

*Low prevalence:* If HIV prevalence is much lower (0.1%), only 10 of 10,000 specimens will be from persons who are infected with HIV (true-positive) and 9,990 will be from persons who are not infected with HIV. If test specificity is 99.8%, results for 20 specimens will be false-positive. In this case, of the 30 with positive results (10 true-positives plus 20 false-positives), only 33% will be actually infected and the number of false-positives will exceed the number of true-positives. A testing program in a low prevalence population that implements routine testing of everyone in the population may be testing more low-risk people, and may expect to see more false-positive than true-positive results.



### Our testing program's HIV screening test has too many false-positive results. What can we do?

If you are testing a low-prevalence population, you can expect a higher proportion of all positive tests to be false-positive. If your testing program observes a number of false positives in excess of expectation for that screening test and specimen type (e.g., > 2 false positives per 100 negatives), contact the test manufacturer and your health department.

### References

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