

Reducing the cost of HIV antibody testing

SIR—Tamashiro of the World Health Organization and colleagues (July 10, p 87; Oct 2, p 866) and your correspondents (Aug 7, p 379) present valuable discussion of ways to reduce the cost of HIV antibody testing. Especially important are the comments on pooling of five samples for screening of blood donations or when conducting prevalence surveys of low-prevalence populations, and the notion of strategy I (one enzyme-linked immunoassay [ELISA]), II (one ELISA as screener, second as confirmatory), and III (one ELISA as screener and two different ELISA tests as confirmatory). Unfortunately, Tamashiro's first report had two omissions. When discussing HIV antibody testing for strategies II and III they state "the first test should have the highest sensitivity, whereas the second and third test should have higher specificity than the first."; this is not wholly correct. If the sensitivity of the second or third test is lower than the sensitivity of the first test, then some of the true HIV-positive persons will not be identified as such. Since those who are HIV positive on the first test and HIV negative on the second test (with strategy II), or second and third tests (with strategy III) are deemed HIV negative, Tamashiro and colleagues' guidelines would result in excessive false negatives. What they should have said is: the first test should have high sensitivity and at least moderate to high specificity, whereas the second and third test (used for confirmatory testing) should have equal sensitivity and higher specificity than the first.

This same difficulty exists in the use of the well-known western blot as a confirmatory test. As noted by Soriano et al,¹ the specificity of the western blot tends to be very high (conforming to the standard of Tamashiro et al) but the sensitivity varies considerably, depending on the criteria used to interpret the band profile. The commonly used US Centers for Disease Control and Prevention definition had a sensitivity of only 95.9% as reported by Soriano et al.¹ With such a low sensitivity, the western blot would fail to confirm 4.1% of HIV-infected individuals in the group that is identified as HIV antibody positive by a screening ELISA. Following Tamashiro's guidelines, those specimens deemed non-reactive to the confirmatory test would be judged HIV negative. This difficulty of false negatives can be reduced if clinicians and research investigators recognise that a confirmatory assay, different from a screening test, must have both high sensitivity and specificity, and select their tests accordingly.

Tamashiro also failed to make the distinction between the needs of surveillance programmes that use strategy I, versus screening or diagnostic programmes that use strategies II or III. As colleagues and I reported earlier,² surveillance tests that attempt to identify the prevalence of HIV in a group require high specificity and can tolerate moderate sensitivity; this differs from screening tests, which require high sensitivity but only moderate to high specificity. Confirmatory tests should have both high sensitivity and specificity.

Although it is important to reduce the cost of HIV antibody testing, clinicians and public health officials must also keep in mind the characteristics of the test to avoid misclassification of HIV-infected and non-infected individuals. If these characteristics are overlooked, clinical facilities serving testing programmes could become overwhelmed with false positives whereas individuals with false-negative results remain unaware of their HIV status.

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- 1 Soriano V, Gutierrez M, Tuset C, et al. Evaluation of various criteria for the interpretation of western blot for the diagnosis of human immunodeficiency virus infection. Spanish Group for the Study of HIV-2. *Med Clin* 1993; 100: 561-66.
- 2 Frerichs RR, Htoon MT, Eskes N, Lwin S. Comparison of saliva and serum for HIV surveillance in developing countries. *Lancet* 1992; 340: 1496-99.