

---

## Viewpoint

# Personal screening for HIV in developing countries

Ralph R Frerichs

---

Mastro and colleagues' report<sup>1</sup> of female-to-male transmission of HIV-1 in Thailand shows again that surprises should be expected with human immunodeficiency virus (HIV): on the basis of a statistical analysis of young Thai military conscripts, Mastro et al reported that HIV is 30-50 times more infectious for female-to-male transmission than previously estimated. Although reasons remain elusive, they proposed that the higher transmission probability is consistent with national epidemiological patterns of HIV infection. Similar uncertainty over HIV being faced by investigators in Thailand was also voiced in a recent survey of 150 top AIDS researchers.<sup>2</sup> They noted that new knowledge about HIV is often at odds with old assumptions. This realisation should also hold true for public health professionals, in their attempt to control the HIV epidemic. Rather than assume that the correct path is known, health officials should remain open to new thoughts and new programmes. Encouraging voluntary and anonymous testing for HIV in the privacy of the home is one such new approach. Since

there are accurate, acceptable, and inexpensive HIV screening tests, what is needed is political will to make tests available in the private sector and to support the evaluation of widespread self-testing as a control strategy.

### Prevention of HIV transmission

For people in developing countries, there are three main ways to prevent HIV transmission from an infected partner. The first is to assume that all sexual partners might be infected and use condoms with every penetrative sexual event. With a slippage and breakage rate of 10%, the risk reduction associated with universal condom use would be near 90%,<sup>3</sup> although others have estimated condom effectiveness to be nearer 70%.<sup>4</sup> The promise of such a striking reduction in virus transmission has made condoms the intervention method of choice of the World Health Organization (WHO) and other international organisations. The second approach being discussed by many workers is a vaccine, which has not yet been developed.<sup>5</sup> Even if such a vaccine becomes available, the effectiveness probably would range from 60% shown for the cholera vaccine to 95% for the measles vaccine. A third method that holds great promise is voluntary home testing.<sup>6</sup> Depending on the sensitivity of the test and the length of the

---

Department of Epidemiology, University of California Los Angeles, Los Angeles, CA 90024, USA (Prof R R Frerichs DPH)

viraemic but antibody-negative window period, such testing might reduce risk by 95–99% if people use the information to avoid intercourse with an infected partner. Persons who both test their sexual partner and use condoms would have the lowest risk.

### Home testing for HIV infection

Now that assays are available to accurately detect HIV antibodies in saliva,<sup>7-9</sup> home testing is the logical next step for individuals wanting to protect themselves from HIV. WHO recommends testing of blood donations to avoid transmission, and suggests ways to reduce costs of screening in developing countries.<sup>10</sup> The development of similar low cost testing strategies should be encouraged in the prevention of spread from an infected sexual partner. Technology already exists to obtain saliva specimens at home with special collection devices.<sup>9</sup> With additional changes in the market place, people could send numbered specimens to a local laboratory and receive the results anonymously within a few days. If cost is reasonable, the screening test could be widely sold in the private sector in a distribution network similar to that for condoms—pharmacies, food stores, or medical clinics.

Home testing by its nature would be voluntary and anonymous. Rather than demanding that saliva be evaluated as a diagnostic medium for HIV infection, simple saliva tests should be viewed as screening measures for individuals to identify if they or their sexual partners are probably HIV infected. If the saliva test is positive, subjects should be encouraged to go to a medical practitioner for confirmatory testing with blood. Once self-screening is widely being practised, medical personnel would spend less of their time with HIV-negative persons (ie, the worried well). Home testing would eliminate the need for venipuncture screening facilities and labour-intensive pretest counselling sessions—two components that add greatly to the cost and inconvenience of testing in many developing countries. Instead, health officials could spend more of their scarce resources on people who are actually infected, including diagnostic testing and counselling about treatment and care options, and ways to limit transmission.

### HIV in Thailand

Thailand is facing a major HIV epidemic, which is well documented by an innovative sentinel surveillance programme. Despite much technical and financial assistance, the epidemic has continued to confound experts with its persistently rising prevalence in most sentinel groups. The prevalence of infection in lower-class sex workers has risen strikingly from about 5% in June, 1989, to over 30% in June, 1993. The rate has been equally alarming among males at sexually transmitted disease (STD) clinics and higher-class sex workers, rising from a low of 1–2% to a high of 8–10% during 1989–93. Finally, the most frightening increase of all has occurred in women at antenatal clinics who showed a low prevalence of 0.1% in June, 1989, and 4 years later are edging towards 2% (information from the Division of Epidemiology, Thai Ministry of Public Health). Other recent studies of young men entering the military in the northern region of Thailand have reported HIV prevalence of 12–15%, supporting the notion that the epidemic is gaining momentum and that existing control strategies are not successful, most notably in the general population.<sup>11,12</sup>

The rapid expansion of the epidemic has occurred at a time when Thailand has substantial funding and technical

assistance to support control efforts.<sup>13</sup> Funds have come from the active national economy and from international donor agencies. Like most government health agencies, the Thais have followed the HIV control suggestions of WHO and various non-governmental organisations—namely, screening of blood, promoting early treatment of sexually transmitted diseases, health education of the public about ways to prevent HIV transmission, sterilisation of blood injecting equipment, and promotion and sale of inexpensive condoms, especially to commercial sex workers.<sup>5,14</sup> Testing of people for HIV antibodies was not judged a desirable option in Thailand, but it is done in a small way by some insurance companies, private practitioners, and a few anonymous testing centres run by the Red Cross and other organisations. As a result, most Thai citizens, like most populations in developing countries, have no way of knowing whether they or their sexual partners are infected with the virus.

### Transmission in couples

If infection with the HIV-1 strain reported by Mastro and associates<sup>1</sup> occurs before marriage in Thailand, the susceptible partner will soon become infected. On the assumption of a transmission probability of 0.031 per coital event,<sup>1</sup> 91 coital events per year, 5% condom use, and a condom slippage or breakage rate of 10%,<sup>3</sup> there is a 91% chance that the sexual partner will be infected during the first year of marriage. Of course, steps can be taken to avoid becoming infected. In view of present policies, couples in Thailand will probably be unaware of each other's HIV infection status. Thus condoms could be recommended for every coital act. Most married Thais, however, do not favour this approach. Only 5% of Thai married couples use condoms on a regular basis (information from the Thai Red Cross and Chulalongkorn University), suggesting that condoms are viewed as both a hindrance to conception and an unnecessary intrusion into the intimacy of marriage.

If inexpensive HIV home tests are available, the couple has another option. They could screen each other for the presence of HIV antibodies and then act on the findings. A screening test should be an important component of partner selection so that marriage can start as a union between two uninfected persons. Such screening would prevent men from marrying HIV-infected women who return home after spending several years as a commercial sex worker. It would also prevent women from marrying men who have experimented in their youth with illicit intravenous drugs, anal intercourse with other men, or the services of prostitutes.

Once married, a monogamous woman faces the danger of being infected by her promiscuous or drug-using husband. If he shows signs or symptoms of an STD or fresh needle-marks, she could again quietly screen him at home for HIV or she could insist he always use a condom for sexual intercourse. It is also possible that the act of testing makes both partners more aware that either might become infected and, thus, view more favourably the practice of monogamy.

### Conclusions

What is evident from the dramatic emergence of the HIV epidemic is that people in Thailand, as in other developing countries facing such epidemics, have few alternatives other than premarital screening and monogamy for saving their country from social and economic disaster. It is time to

reconsider old ideas and questionable assumptions about what will and will not work. It is time for public health officials in developing countries to join with the private sector and evaluate the cost and effectiveness of home testing for HIV infection.

---

#### References

- 1 Mastro TD, Satten GA, Nopkesorn T, Sangkharomya S, Longini IMJ. Probability of female-to-male transmission of HIV-1 in Thailand. *Lancet* 1994; **343**: 204-07.
- 2 Cohen J. AIDs research: the mood is uncertain. *Science* 1993; **260**: 1254-55.
- 3 Trussell J, Warner DL, Hatcher RA. Condom slippage and breakage rates. *Fam Plan Perspect* 1992; **24**: 20-23.
- 4 Weller SC. A meta-analysis of condom effectiveness in reducing sexually transmitted HIV. *Soc Sci Med* 1993; **36**: 1635-44.
- 5 Kallings LO. HIV infection in the nineties. *Vaccine* 1993; **11**: 525-28.
- 6 Frerichs RR, Seymour E. More on office-based testing for HIV. *N Engl J Med* 1993; **328**: 1717.
- 7 Frerichs RR, Htoon MT, Eskes N, Lwin S. Comparison of saliva and serum for HIV surveillance in developing countries. *Lancet* 1992; **340**: 1496-99.
- 8 Frerichs RR, Eskes N, Htoon MT. Validity of three saliva assays for HIV-antibodies. *J Acq Immun Def Syndr* 1994; **7**: 522-24.
- 9 Tamashiro H, Constantine NT. Serological diagnosis of HIV infection using oral fluid samples. *Bull WHO* (in press).
- 10 Tamashiro H, Maskill W, Emmanuel J, Fauquex A, Sato P, Heymann D. Reducing the cost of HIV antibody testing. *Lancet* 1993; **342**: 87-90.
- 11 Nelson KE, Celentano DD, Suprasert S, et al. Risk factors for HIV infection among young adult men in northern Thailand. *JAMA* 1993; **270**: 955-60.
- 12 Nopkesorn T, Mastro TD, Sangkharomya S, et al. HIV-1 infection in young men in northern Thailand. *AIDS* 1993; **7**: 1233-39.
- 13 Bamber SD, Hewison KJ, Underwood PJ. A history of sexually transmitted diseases in Thailand: policy and politics. *Gentourin Med* 1993; **69**: 148-57.
- 14 Weniger BG, Limpakarnjanarat K, Ungchusak K, et al. The epidemiology of HIV infection and AIDS in Thailand. *AIDS* 1991; **5** (suppl 2): S71-S85.