



[Vol. 21, No. 2 \(July 1993\)](#)

An AIDS Test that Travels Well

by John Eberlee

Few advances have made as large an impact in controlling the spread of AIDS as diagnostic blood tests for the human immunodeficiency virus (HIV). In the developed world, HIV testing has virtually eliminated the risk of viral infection through blood transfusion and has helped health authorities monitor the spread of AIDS.

However, for many developing countries, HIV testing can be an unaffordable luxury. Currently available HIV tests are designed for use by highly trained technicians working in modern clinical laboratories. The tests simply do not travel well to communities where the electricity may be turned off for several hours a day.

But this unsatisfactory situation is about to change. In a project funded by IDRC and the [Rockefeller Foundation](#), researchers at the Program for Appropriate Technology in Health (PATH), a non-governmental organization based in Seattle, Washington, have developed the first screening test ever designed with the realities of developing countries in mind. The test detects antibodies to HIV-1 and HIV-2 AIDS viruses. It gives an answer in 20 minutes, costs just 25 cents per sample, and travels remarkably well.

KEEPING THINGS SIMPLE

"We insisted from the start that the technology be kept simple," says Dr Don de Savigny, the IDRC project coordinator. "We wanted a test that would work as well as the best commercially available tests but be more appropriate for resource-poor settings." This meant the test had to work without electricity, instrumentation or cold-chain, be easy to learn and sustain, and be manufacturable in developing countries."

The test kit features a plastic dipstick shaped like a comb with eight test strips or teeth. The test is performed by dipping the teeth in blood samples for 10 minutes, rinsing them, followed by a soaking in a reagent solution. If a red dot appears on a tooth, then the corresponding sample is almost certainly contaminated.

Evaluations conducted by the World Health Organization and Health and Welfare Canada indicate the dipstick is as reliable as screening tests already on the market. Field trials in Uganda, Kenya, Brazil, China, Indonesia, India and Thailand indicate high sensitivity and false positive readings less than 2% of the time, which is comparable to screening tests used in Canada. So far, Kenya, Uganda, Cameroon, China and Thailand have expressed interest in manufacturing the test; India and Indonesia are already manufacturing it.

According to Dr de Savigny, children and mothers stand to gain the most from this technology. "Blood transfusions are very common in the developing world, especially in Africa where there is a high incidence

of malaria," he says. "Hospitals there see a lot of children with life-threatening anemia who, if they don't get a transfusion within 24 hours, will die. In those situations, if you don't have the ability to screen blood, you transfuse anyway and hope for the best." Besides reducing the spread of HIV, the dipstick may also open some doors in AIDS research. Logistical barriers have so far prevented scientists from monitoring the incidence of HIV in developing countries. But the low cost of the dipstick means it may be possible to conduct surveys involving thousands of people to find out how far HIV has spread.

The dipstick test has already been used to conduct the first seroprevalence survey for HIV in Haiti. IDRC supported Dr Michel Cayemittes of the Institut Haitien de l'Enfance and Dr Catherine Hankins of the Montreal General Hospital to do the research. They used blood samples from simple finger pricks collected on filter paper, a technique pioneered in Canada. The samples came from a randomly selected group of pregnant women from across Haiti. Test results were unlinked from identifiable individuals so that donors remained anonymous.

The Haitian-Canadian team tested its blood samples both conventionally at the laboratory of the Federal Centre for AIDS in Ottawa and using the dipstick technology in Haiti. The results again proved that the dipstick test is reliable and, moreover, it can be used with just a spot of dried blood.

"The cost of collecting blood samples is also a consideration," says Dr de Savigny. "But we've shown that you can use the dipstick on dried blood. All it would take to collect enough blood for testing purposes is a finger prick."

FOR MORE INFORMATION, CONTACT:

Dr Michel Cayemittes
Executive Director
Institut Haitien de l'Enfance
BP 13489, Delmas, Haiti
Tel: (509) 57-1753

Dr Catherine Hankins
Centre for AIDS Studies
DSC, Hopital General de Montreal Suite
300A, 980 Guy Street Montreal, Quebec, H3H 2K3
Tel: (514) 932-3055 Fax: (514) 932-1502

Dr Milton R. Tam
Technical Director
PATH
4 Nickerson Street
Seattle, Washington 98109-1699 USA
Tel: (206) 285-3500 Fax: (206) 285-6619

Unless otherwise stated, all articles and photos may be freely reproduced providing suitable credit is given.

ISSN 0315-9981. This magazine is listed in the Canadian Magazine Index.

- [Subscription information](#)
- [Return to the IDRC Reports homepage](#)
- [Return to the IDRC homepage](#)

Please send your comments to [editor of Reports](#).