

START-UP: Innovation in cervical cancer screening

New tests offer hope for women in the developing world

Two new tests to detect infection with the types of human papillomavirus (HPV) that cause cervical cancer promise to bring better protection to women, no matter where they live. Designed for use in low-resource settings, these screening tools are an innovative answer to the challenge of early detection of the precursors of cervical cancer.

Meeting the need for appropriate screening tools

Despite the availability of new vaccines for HPV, millions of women in the developing world—including those who are vaccinated—would benefit from cervical cancer screening. But the service usually is not available because of the technical complexity of Pap smears, which have proven difficult to sustain in low-resource settings. More affordable and appropriate tools to detect cervical abnormalities before they turn cancerous are urgently needed. The World Health Organization has confirmed that HPV testing could fill that gap, stating in its recommendations that “there is sufficient evidence that testing for human papillomavirus infection as the primary screening modality can reduce cervical cancer incidence and mortality rates.”¹

Both the *CareHPV*[™] DNA test (QIAGEN) and the Arbor Vita E6 Test (Arbor Vita Corporation) are designed to address this need. The tests have been developed in partnership with PATH’s Screening Technologies to Advance Rapid Testing for Cervical Cancer Prevention—Utility and Program Planning (START-UP) project, though PATH has no financial interests in either product. START-UP was initiated to help introduce low-cost, easy-to-use, and culturally acceptable screening technology and treatment strategies for cervical cancer in low-resource countries. The project’s goal is to make rapid, accurate precancer screening feasible and accessible at lower levels of the public health care system, and to increase the number and types of staff able to provide effective and efficient screening and treatment services.

CareHPV[™] test

CareHPV[™] is a molecular test that detects 14 oncogenic HPV types. The test recently was evaluated in Shanxi, China, where 2,500 rural women were screened using vaginal and cervical samples. Results showed that the sensitivity of the test is much



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For more information

For more information about the *CareHPV*[™] test or Arbor Vita’s E6 test—or PATH’s other work in cervical cancer prevention—please contact:

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better than visual inspection methods and approaches that of QIAGEN's gold standard Hybrid Capture II test, but at a more affordable price and requiring less equipment. The high accuracy of *careHPV*TM is particularly important for women in resource-poor settings, who may be screened only once or twice in their lifetimes. Results from a study in India are still under evaluation.

Soon to be commercially available, *careHPV*TM yields results in approximately 2.5 hours. A benefit of this rapid feedback is that initial HPV testing could be paired with visual inspection for treatment-triage at the district or county level, followed either by cryotherapy treatment in the same clinic or other treatment at a referral facility as indicated. This screen-and-treat approach could dramatically reduce loss to follow-up observed when women are required to make repeat visits for screening, diagnosis and treatment. In some situations, *careHPV*TM can be used with self-obtained vaginal samples (as an optional approach to the usual provider-obtained cervical specimen), decreasing the need for a speculum exam and enhancing test acceptability among patients.

Arbor Vita E6 test

The Arbor Vita E6 test is a lateral-flow (strip) test designed to detect increased expression of the E6 biomarker, a viral protein that appears during precancer stages. The advantage of this test is that a provider can differentiate between women who simply have HPV infection (which may spontaneously clear), from those who have begun to develop neoplastic precancerous cells. The E6 test is intended for use at health facilities equipped with basic laboratories.

A prototype test that detects E6 expression from the seven most common HPV types is being evaluated to establish its accuracy in identifying women with precancerous lesions, along with its validity in predicting the risk of precancer in the future.

Next steps to introduction

PATH recognizes that development of new tests alone will not suffice and that ministries of health need evidence that these new approaches are appropriate for their health system infrastructure and their geographic, cultural, and economic circumstances. In addition, private industry needs guidance navigating the complexities of public sector product introduction



A laboratory technician working with the *careHPV*TM test in Shanxi, China.

in developing countries. To address these issues, in 2009 PATH inaugurated demonstration projects using *careHPV*TM in India, Nicaragua, and Uganda. Lessons learned from the projects will inform other countries about the feasibility, effectiveness, and acceptability of this new test.

Finally, in order to speed establishment of health services ready to incorporate the new tests, PATH is working closely with partner Jhpiego to foster regional training Centers of Excellence in the developing world. Carefully selected service providers will be trained in triage and treatment techniques necessary for follow-up of adult women who test positive for HPV or E6, and they will be trained and equipped to train others. The PATH/Jhpiego team is also identifying and supporting regional and global champions for alternative screening and treatment technologies, working in close collaboration on that effort with the Cervical Cancer Action coalition, the Alliance for Cervical Cancer Prevention, the World Health Organization, other United Nations agencies, and a host of professional societies.

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¹International Agency for Research on Cancer (IARC), World Health Organization. *IARC Handbooks of Cancer Prevention: Cervix Cancer Screening*. Vol. 10. Lyon, France: IARCPress; 2005.