

Evaluating scenarios for scaling up effective screening and treatment of cervical precancer

Background

Cervical cancer is the second most common cause of cancer death globally among women younger than 50 years. More than 3.5 million women will die from it in the next ten years unless secondary prevention is scaled up (Globocan 2018). PATH aims to improve access to and use of effective cervical cancer screening and precancer treatment programs in low- and middle-income countries (LMICs) as the most efficient approaches to control and prevent cervical cancer. As countries plan to improve and increase coverage of their programs to reach more women, tools to determine what screening and treatment approaches are most appropriate in each context will help decision-makers consider important trade-offs across approaches and make better use of limited resources.

New tool for decision-making

To assist country decision-makers in evaluating various screening and treatment programs, PATH, with support from the Bill & Melinda Gates Foundation, has developed a scenario-based Cervical Precancer Planning Tool. This interactive Excel model explores both screening and treatment programs, and it has scenarios for each that can be compared. The screening component evaluates the number of women screened, the screening accuracy, and the associated costs for four different screening approaches (Table 1). The treatment component evaluates the number of women treated for precancerous lesions, the number of units of treatment equipment needed by type, and the associated costs for five different equipment deployment scenarios (Table 2). It currently contains adjustable baseline data for 14 countries,* though it can be adapted for use by any LMIC.

This tool is publicly available to country decision-makers who want to weigh the trade-offs of patient convenience and access, test performance, and efficient utilization of equipment, skilled personnel, and financial resources. Results generated by the tool can be used to inform national screening and treatment strategies and decisions about program planning, technology selection, device procurement, and equipment deployment (Figure 1).

Table 1. Screening approach overview.

Approach	Description
VIA alone	A woman in the selected screening age range is screened with naked eye visual inspection with acetic acid (VIA) test. If positive, she is referred to treatment.
HPV alone	A woman in the selected screening age range is screened with a human papillomavirus (HPV) test. If positive, she is referred to treatment.
HPV + VIA triage	A woman in the selected screening age range is screened with an HPV test. If positive, she is referred to a VIA triage test. If the triage test is positive, she is referred to treatment.
HPV + enhanced triage	Same as above (HPV + VIA triage), but the triage test has an improved performance compared to a traditional triage test (improved sensitivity and specificity).

Table 2. Treatment scenario overview.

Scenario	Description
1) Single-visit approach (SVA) for screen and treat	Treatment is available at all health centers and higher-level facilities. Women receive screening and treatment in one facility visit.
2) Hospital treatment	Treatment is available only at hospitals. If a woman is screened at a health center, she will need to travel to a hospital for a second patient visit to receive treatment.
3) District treatment	Treatment is available only at select district hospitals. A minimum of one treatment device is placed per district. Additional devices are placed in districts with increased demand.
4) District clustering	Treatment is available only at select district hospitals. Up to two districts with lower demand can share one treatment device. Additional devices are placed in districts with increased demand.
5) Hybrid static-mobile	Treatment devices are based at select hospitals and are available at these hospitals, as well as delivered by mobile units from hospitals to screening sites.

Note: All treatment scenarios assume that screening is available at all health centers and higher levels of the health system. As women travel farther to reach care, the model assumes that the treatment completion rates will decrease. These inputs are adjustable by the user.

* The countries that have baseline data inputs in the model are El Salvador, Ethiopia, Ghana, Guatemala, Honduras, Kenya, Malawi, Myanmar, Nicaragua, South Africa, Tanzania, Uganda, Zambia, and Zimbabwe. Any other LMIC can use the model by providing its own data inputs.

Supporting evidence-based planning

The screening component of the model evaluates trade-offs between different screening approaches, including the number of women screened per year, screening accuracy, and the associated costs. For example, VIA is a relatively inexpensive test, but due to low sensitivity and its dependency on provider performance, it will have a higher number of missed cervical precancer cases relative to HPV screening. Screening with VIA (non-enhanced) or the HPV test alone will result in overtreatment of women who are not currently at risk of cancer. However, overtreatment can be greatly minimized if a follow-on triage test is used with the HPV test.

The treatment component of the model evaluates trade-offs that need to be considered when evaluating options for scaling up use of cervical precancer treatment. For example, a single-visit approach (SVA) for screen and treat (Scenario 1) may lead to treatment for the most screen-positive women, but the financial and human resources costs for this strategy are often higher. Furthermore, treatment devices would likely be highly

underutilized. Although reducing the number of devices deployed reduces the costs dramatically and improves equipment utilization, many women who screen positive for cervical precancer would require a second visit for treatment. Depending on the deployment scenario, women may need to travel long distances for a follow-up treatment visit, putting services out of reach for some.

This tool provides country-level decision-makers with practical information and data needed to compare multiple screening and treatment scenarios, and ultimately improve access to a lifesaving screening and treatment while optimizing use of resources.

For more information

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The tool can be accessed at:

<https://www.path.org/programs/market-dynamics/cervical-precancer-planning-tool/>

Figure 1. Example of Cervical Precancer Planning Tool screening and treatment dashboards: Uganda.



PATH is a global organization that works to eliminate health inequities by bringing together institutions, businesses, investors, and individuals to solve the world's most pressing health challenges. With expertise in science, market development, technology, advocacy, and dozens of other specialties, PATH develops and scales solutions—including vaccines, drugs, devices, diagnostics, and innovative approaches to strengthening health systems worldwide.

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