AdSEARCH by icddr,b

Integrating HPV-Based Cervical Cancer Screening into Rural Primary Healthcare in Bangladesh

Anadil Alam[1], Farah Naz Rahman[1,2], Md Mahiur Rahman[1], Md Ashraful Haque[1], Khandaker Sabit Bin Razzak[1], Sabrina Jabeen[1], Sifat Parveen Sheikh[1], Sezanur Rahman[1], Dr. Shehrin Shaila Mahmood[1], Mohammad Wahid Ahmed[1], Zillur Rahman Sakin[1], Lutfa Begum Lipi[3], Mustufa Mahmud[4], Riffat Ara[5], Md. Nurul Islam Khan[6], Farida Akter[7], Ashrafun Nessa[8], Quamrun Nahar[9]

[1]International Centre for Diarrhoeal Disease Research, Bangladesh (icddr,b)
[2]School of Public Health and Preventive Medicine, Monash University, Australia
[3]Department of Obstetrics & Gynaecology, Dhaka Medical College Hospital (DMCH)
[4]Maternal Health Programme, MNC&AH, Directorate General of Health Services (DGHS)
[5]National Institute of Cancer Research & Hospital (NICRH)
[6]World Health Organization (WHO), Bangladesh
[7]United Nations Population Fund (UNFPA), Bangladesh
[8]Bangladesh Medical University (BMU)
[9]BRAC James P. Grant School of Public Health, BRAC University

Published in October 2026

Background

- Cervical cancer is preventable when high-risk Human papillomavirus (HPV) infection and precancerous lesions are detected and managed through an effective screening and treatment pathway (World Health Organization [WHO], 2020).

- Bangladesh's public-sector cervical cancer screening programme has historically relied on Visual Inspection with Acetic Acid (VIA) (Islam et al., 2025).

- HPV-DNA testing offers an objective primary screening method, and self-collection can reduce barriers associated with pelvic examination, privacy, time and access to trained providers (Arbyn et al., 2018). The enhanced package evaluated through this AdSEARCH study added self-collected vaginal swabs for HPV-DNA testing, GeneXpert-based testing at the primary-care level (Toliman et al., 2016), structured result communication, combined HPV/VIA interpretation, treatment of eligible lesions, and referral where required.

- Implemented under the Maternal Health Programme, Maternal, Neonatal, Child and Adolescent Health (MNC&AH), Directorate General of Health Services (DGHS), with technical support from the Obstetrical and Gynaecological Society of Bangladesh (OGSB) and icddr,b, guided by a multi-agency Technical Working Group.

In Bangladesh

11,100
estimated new cervical cancer cases diagnosed annually

6,560
estimated cervical cancer deaths annually

13 /100,000
cervical cancer incidence rate

18%
Screening coverage of eligible women (30–60 yrs), 2014–2024, vs WHO target of 70%

Accounting for 14% of all female cancers, cervical cancer is the most common cancer among women in the country.

Sources: International Agency for Research on Cancer (2026); screening coverage, 2014–2024: Nessa et al. (2025); target: WHO (2020).

Objectives

To assess the implementation outcomes of an enhanced cervical-cancer screening package in selected rural primary healthcare settings in Bangladesh.

- Assess the feasibility, acceptability, appropriateness and adoption of self-collected vaginal swabs for HPV-DNA testing.
- Assess the feasibility, appropriateness, adoption and fidelity of GeneXpert-based HPV-DNA testing.
- Assess the feasibility, appropriateness and adoption of strengthened community mobilisation and referral mechanisms.
- Estimate implementation cost and cost per case diagnosed for the enhanced screening package.
- Assess the care continuum following HPV-DNA and VIA screening, including treatment, referral and follow-up.
- Identify barriers, facilitators and implementation adaptations relevant to integration within the health system.

Key Co-Design Adaptations

Study Setting

Baliakandi Upazila Health Complex (UHC) and linked community-clinic/camp services, Rajbari District

Study Population

Women aged 30 - 60 years eligible for Cervical cancer screening

Implementation Approach

Mixed-method implementation research with co-design, phased implementation and ongoing monitoring

Sequence of screening

Self-sampling was placed before VIA, protecting specimen integrity and creating a consistent participant flow.

Interpretation & management

HPV and VIA results were considered together, creating a single pathway from screening to treatment or referral.

Treatment at primary care

Eligible lesions received consultant-led thermal ablation at the Upazila Health Complex (UHC), reducing the need for immediate tertiary-facility travel.

Reach & mobilisation

Community camps and mobilisation were intensified through field workers, leaflets and mothers' meetings when enrolment was slower than expected.

Over an 8-month implementation:

545 women were screened

Following a four-phase implementation-science framework:

Understand the system | Find leverage | Act strategically | Learn and Adapt

8 national key-informant interviews

3 national *and* **3 local stakeholder workshops** *with the Technical Working Group*

Facility Readiness, Training and Screening Pathway

Facility renovation

The VIA counselling room and the GeneXpert testing room were physically upgraded, improving:

- Privacy screening,
- Lighting, layout and workflow for counselling,
- GeneXpert space with power, ventilation and biosafety set-up required.

Hands-on GeneXpert training

UHC nurses, laboratory personnel and study staff completed 2 workshop batches covering:

- Classroom instruction,
- Hands-on practice: Live machine operation, supervised sample-handling drills and supervised laboratory practice, covering biosafety, cartridge operation, result interpretation and participant flow.

Clinical refresher & advanced training

- 05 senior staff nurses completed two batches of VIA/CBE refresher training,
- 01 junior gynaecology consultant completed advanced colposcopy and lesion-management training.

Cost-tool & community orientation:

- Study nurses and study team were oriented on the tablet-based patient-cost tool, including sensitive questioning and role-play.
- Community reach was strengthened through field workers, leaflets, community groups and mothers' meetings feeding into Baliakandi UHC from linked clinics and outreach camps.



Figure: Operational implementation pathway illustrated with project photographs: registration, self-sampling instruction, private self-collection, GeneXpert testing and treatment/care

Implementation Outcomes

- HPV self-sampling with on-site GeneXpert testing is **feasible** and **acceptable** at rural primary-care level
- **Linkage to care** after a positive result is the main gap; providers called for more **staff support**, counselling and follow-up tracking

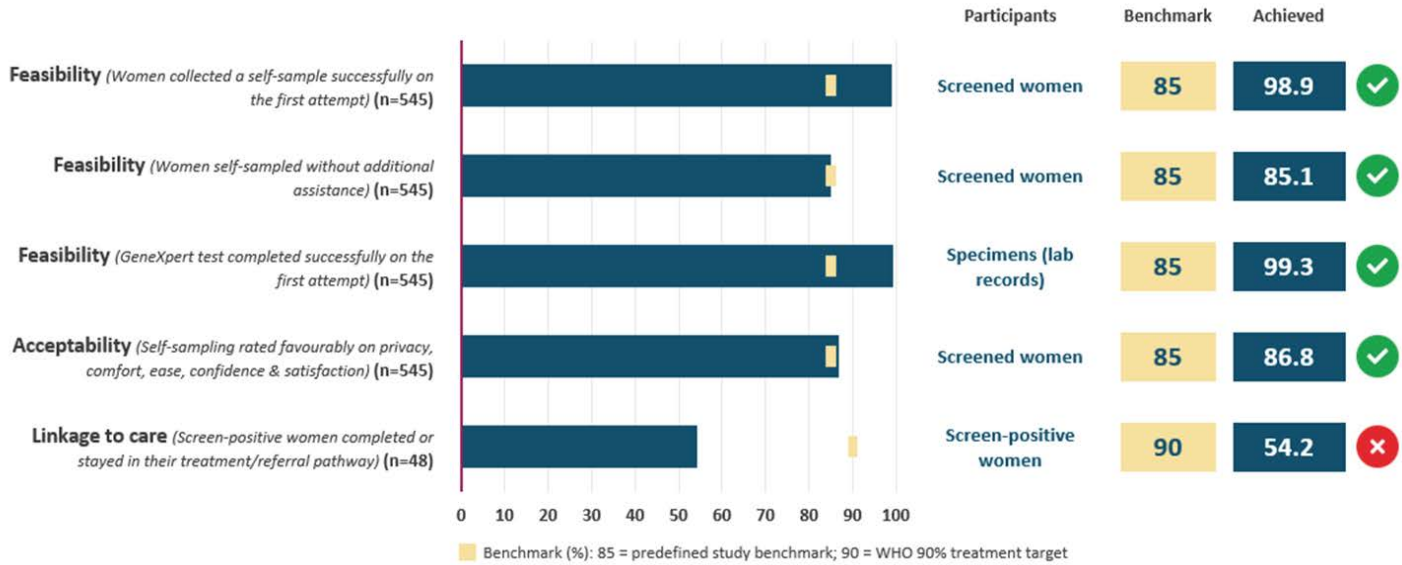


Figure: *Implementation outcomes of HPV-DNA self-sampling at Baliakandi UHC, Rajbari (percentage achieved vs benchmark)*

> *We are poor people; we don't have money. If the test is done free of cost, then it is good for us. We don't have the ability to save money to spend on tests."*
>
> - *Screened woman, IDI-SR-004*

> *This is a very good method. Women have a sense of modesty. No one had to see it. I collected the sample myself, with my own hand."*
>
> - *Screened woman, IDI-SR-008*

> *If this is implemented at the upazila level everywhere, it would be very good. It would reach the doorstep of common people. But the issue is manpower; if proper training is given, everyone will probably try to manage it."*
>
> - *Senior Staff Nurse, KII-009*

> *If I have to do everything alone... having a helping hand would be useful, someone to handle the paperwork."*
>
> - *Senior Staff Nurse, KII-011*

Challenges

Workforce & task-sharing

Counselling, specimen handling, GeneXpert operation and documentation fell on a small number of staff, with providers describing workload, not the technical steps themselves, as the main day-to-day constraint.

Continuity of care

Referral and treatment completion after a positive result proved the most fragile part of the pathway, with women lost to follow-up despite high uptake and fidelity at the screening stage itself.

Awareness & acceptability

Screened women and providers described incomplete awareness, fear and embarrassment around reproductive-health screening, and uncertainty among older or less confident women, as barriers that community outreach and counselling needed to address.

Way Forward

Priority Actions Now

- Integrate HPV self-sampling within the existing VIA/UHC platform, with national guidance on eligibility, intervals and referral.
- Establish active navigation for every screen-positive woman, from result communication through documented treatment completion.
- Standardise counselling scripts and protect privacy with a dedicated self-collection space, assisted by trained staff on request.

For Phased Scale-Up

- Define an explicit workforce and task-sharing model across nursing, laboratory and community roles, with refresher training.
- Expand first to a small number of additional UHCs with varied contexts, pairing expansion with budget-impact planning.
- Monitor the full care continuum, not screening volume alone, on programme dashboards.

Future research priorities

- Multi-district evaluation;
- Complete downstream clinical-outcome data (colposcopy, biopsy, CIN2+/CIN3+);
- Interventions to reduce loss to follow-up;
- A full economic/ budget-impact evaluation for scale-up.

References

1. *Arbyn, M., Smith, S. B., Temin, S., Sultana, F., & Castle, P. (2018). Detecting cervical precancer and reaching underscreened women by using HPV testing on self samples: Updated meta-analyses. BMJ, 363, Article k4823. https://doi.org/10.1136/bmj.k4823*
2. *International Agency for Research on Cancer. (2026). Global Cancer Observatory: Cancer Today (2024 estimates, version 1.0). World Health Organization. https://gco.iarc.who.int/today*
3. *Islam, M. F., Nessa, A., Zaki, Q. A., Ashrafi, S. A. A., Qayum, M. O., Hassan, M. R., & Shirin, T. (2025). Evaluation of the National cervical cancer surveillance program in Bangladesh: Performance, strengths, and opportunities for improvement. PLOS Global Public Health, 5(5), Article e0004595. https://doi.org/10.1371/journal.pgph.0004595*
4. *Nessa, A., Azad, A. K., Uddin, S. M. N., Khan, M. A. H., Zaman, S., & Khan, M. A. S. (2025). Cervical cancer screening data from the case-based national electronic registry in Bangladesh. BMC Global and Public Health, 3, Article 34. https://doi.org/10.1186/s44263-025-00145-x*
5. *Toliman, P., Badman, S. G., Gabuzzi, J., Silim, S., Forereme, L., Kumbia, A., Kombuk, B., Kombati, Z., Allan, J., Munnull, G., Ryan, C., Vallely, L. M., Kelly-Hanku, A., Wand, H., Mola, G. D. L., Guy, R., Siba, P., Kaldor, J. M., Tabrizi, S. N., & Vallely, A. J. (2016). Field evaluation of Xpert HPV point-of-care test for detection of human papillomavirus infection by use of self-collected vaginal and clinician-collected cervical specimens. Journal of Clinical Microbiology, 54(7), 1734–1737. https://doi.org/10.1128/jcm.00529-16*
6. *World Health Organization. (2020). Global strategy to accelerate the elimination of cervical cancer as a public health problem. https://www.who.int/publications/i/item/9789240014107*

Advancing Sexual and Reproductive Health and Rights (AdSEARCH) by icddr,b
68, Shaheed Tajuddin Ahmed Sarani, Mohakhali, Dhaka 1212
Email: adsearch_official@icddrb.org | **Website:** adsearch.icddrb.org

In partnership with Canada
icddr,b