

Evaluation of the National Cervical Cancer Screening Programme of Bangladesh and the formulation of quality assurance guidelines

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Abstract

Background/Methodology External quality assurance for the National Cervical Cancer Screening Programme of Bangladesh was done in June 2008 by the United Nations Population Fund (UNFPA). The programme, initiated in 2004, has set up screening facilities in 44 districts of Bangladesh. Women aged over 29 years are screened using visual inspection after acetic acid application (VIA) by trained paramedics. Independent consultants not involved in strategic planning or implementation of the programme were engaged to review the ongoing activities. They visited different service delivery set-ups, collected data using a structured proforma, interviewed the service providers, and held discussions with the programme managers. This paper summarises the observations and recommendations of the experts performing the quality control process.

Results/Conclusions The consultants observed that the programme was based on largely opportunistic screening

with good central co-ordination and some elements of organised screening. The coverage of the target population at the end of 4 years was very low. The compliance to colposcopy was good, though nearly half of the patients with high-grade precancers did not receive treatment. Cryotherapy was infrequently used and a 'see and treat' policy was rarely followed. No strategy for internal monitoring and quality control was built into the programme. The reviewers enumerated the quality assurance standards at various levels of service delivery based on which the performance assessment can be done periodically. This is the first evaluation report of a VIA-based national cervical screening programme.

Keywords Bangladesh, cervical cancer screening, national programme, quality control, visual inspection with acetic acid

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Introduction

Every year an estimated 13 000 women are diagnosed with cervical cancer and 6600 die from the disease in Bangladesh.¹ Population-based cervical cancer screening was initiated in Bangladesh in 2004 as a pilot study and in 2005 as a national programme.² Visual inspection after application of acetic acid (VIA) is a simple and affordable screening test with acceptable sensitivity and specificity in the range 56–77% and 64–86%, respectively, in a research setting.^{3,4} A population-based study conducted in Bangladesh observed that the sensitivity and the specificity of VIA performed by trained paramedics were 79% and 57.4%, respectively.⁵ Bangladesh is one of the first countries in the world to introduce VIA as the screening test for its national cervical cancer screening programme.

The national cervical cancer screening guidelines of Bangladesh were formulated previously by an advisory board composed of national and international experts.⁶ Following establishment of the guidelines, VIA is being done by trained nurses at the District Hospitals and by trained health workers at the maternal and child welfare centres (MCWCs), both situated at the district headquarters. Women aged 30 years and above are expected to be screened

Key message points

- Bangladesh launched a national cervical cancer screening programme in 2004 using visual inspection after application of acetic acid (VIA) as the screening test.
- The programme is largely opportunistic, with good central co-ordination and some elements of organised screening.
- The programme initially focused on infrastructure development and training of health professionals to conduct screening, detection and treatment of cervical cancer precursors at secondary and tertiary levels of health care. A broad-based awareness campaign is necessary to improve uptake.

at 3-year intervals at no cost to themselves. Referral centres for the screen-positive women have been established in Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka together with seven Medical College Hospitals with facilities to perform colposcopy, cervical biopsy and precancer management. BSMMU is the national co-ordinating centre responsible for training, setting up new facilities and maintaining liaison between national health services and the major funding agency, the United Nations Population Fund (UNFPA), Bangladesh.

UNFPA decided to evaluate the programme in June 2008 by means of a team of external reviewers, and to introduce at least some of the components of organised cervical screening into the predominantly opportunistic programme. The reviewers also formulated a protocol for continued internal quality assurance so that in future data could be collected in a standardised manner, analysed in a meaningful way, and any necessary modifications implemented. Some modifications/improvements were suggested within the framework of the national guidelines. The methods of evaluation, salient observations and key recommendations are described in this paper. This is probably the first instance of a VIA-based national programme being evaluated and reported. The challenges faced and the lessons learnt in the formative stage

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of the programme may hopefully guide others who intend to implement VIA-based cervical cancer screening programmes in low- and medium-resource countries.

Objectives of the evaluation study

The objectives of the evaluation study were three-fold:

- To provide a framework for identifying the strengths and weaknesses of the ongoing programme and to develop a mechanism to report and resolve problems at the earliest opportunity.
- To define the measurable indicators that will help assess the performance of the programme in achieving the stated targets and goals.
- To assist continuous improvement in quality for all aspects of cervical screening service delivery.

Methods

Bangladesh is a middle-income country with a total population of 124 million and is divided into 64 districts. At the time of the present evaluation the screening facilities were set up in 44 districts.

Experts not involved in the strategic planning or implementation of the programme were engaged by UNFPA to evaluate the programme in June 2008. One reviewer (PB) was from outside Bangladesh and had experience in field research on VIA and in running VIA-based demonstration screening programmes. The other consultant (MM) was from Bangladesh, and was experienced in performing quality assurance evaluation for different public health programmes. The two experts visited different levels of service delivery set-ups in Dhaka (the capital city of Bangladesh) and four other districts where the programme had been in place for at least 1 year by December 2007. Data were collected using a common structured form (available from the authors). They examined the records for their completeness, and conducted in-depth interviews with the service providers and the programme managers over a period of 12 days. The performance of the colposcopy clinic at BSMMU was evaluated by analysing the computerised database records of the referred patients maintained there. The modules and contents of the training programme and the teaching aids at BSMMU were assessed.

There is no population-based cancer registry in Bangladesh. Consequently no incidence or mortality data on cervical cancer could be obtained.

UNFPA obtained the necessary approval from the appropriate authorities of the Ministry of Health, Government of Bangladesh before initiating the evaluation.

Observations of the study group

Evaluation of the screening facilities

Women aged over 29 years attending the outpatient department of the designated screening centres with various ailments and any women that accompanied them are counselled by the test providers about undergoing screening. Women with symptoms suggestive of lower genital tract infection or of cervical malignancies are also sent for VIA by clinicians. As a result, screening is predominantly opportunistic. Only 8.6% of the women undergoing VIA in the centres evaluated by the study team attended spontaneously after seeing billboard advertisements, posters or hearing about the programme from community health workers. One MCWC that works in collaboration with a voluntary organisation to motivate women in the community reported relatively higher rate of spontaneous screening. A large proportion of the screened women (28% in the centres evaluated) are below the recommended age of screening.

VIA is performed by nurses (at the medical colleges and

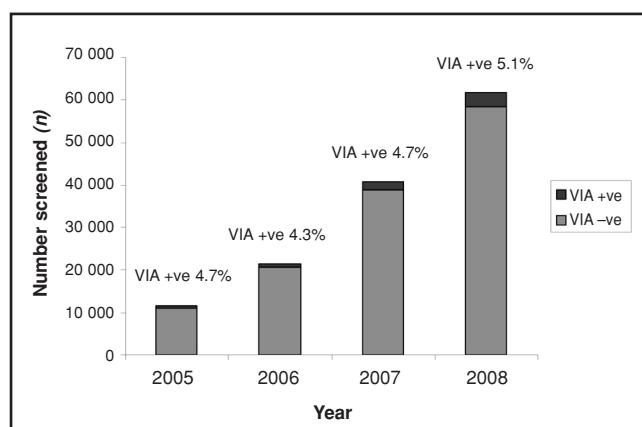


Figure 1 Yearly distribution of the women screened by the National Cervical Screening Programme of Bangladesh and visual inspection after acetic acid application (VIA) positivity

the district hospitals) and female health workers (at the MCWCs) after undergoing a certified training course at BSMMU. Most of them had one reorientation training within 6–12 months of the initial course.

The total number of women screened over the last 12 months varied from 778 to 1819 in the district hospitals audited and from 160 to 823 in the MCWCs audited. The higher number of screened women at the district hospitals is because they have much higher patient attendance in outpatients compared to the MCWCs. The district in which the voluntary organisations carried out public awareness campaigns had a number of attendees almost equal to the district hospital and to the MCWC.

A total of 135 735 women had been screened during the period January 2005–December 2008 throughout Bangladesh, and by the time of the evaluation in June 2008 this number was 104 098. The uptake of the programme even after 4 years of initiation is very low and the coverage achieved of the target population (roughly 20 million women to be screened over a 3-year period) is almost negligible. The number of women screened per year throughout the country shows a steady upward trend (Figure 1). This is primarily due to an increase in the number of screening facilities rather than an increased rate of uptake of screening.

Overall, 4.7% of all the screened women tested positive on VIA and the positivity remained almost the same over the last 4 years (Figure 1). The VIA positivity varied from 1.4% to 3.1% in the district hospitals and from 7.3% to 12.7% in the MCWCs evaluated. At the district hospitals it is common practice for the nurses to get their positive findings corroborated by the clinicians who proclaim some of the VIA-positive cases as negative without resorting to colposcopy. This is the reason for the low VIA positivity that is likely to affect the sensitivity of the test.

In the present formative stage of the programme the quality control parameters are not properly delineated and data collection is not systematic. Acquiring accurate and complete data to evaluate the efficacy of VIA in the conventional way is not feasible. From the BSMMU colposcopy clinic the colposcopy and biopsy (if performed) reports were obtained for 1257 VIA-positive women referred to the clinic up to December 2007. Of these, 878 (69.8%) women were normal on colposcopy or had negative biopsy reports (VIA false-positives). Biopsy confirmed that cervical intraepithelial neoplasia grade 2 (CIN 2+) lesions were detected in 14.1% (177/1257) VIA-positive patients.

Each screening centre is provided with a register in which to document the details of all screened women and a separate VIA-positive register to record the details of the women who test positive. Though nearly one-fifth of the

VIA-positive women have provided telephone numbers, there is currently no system for contacting them to check whether they have undergone further investigation.

There is no mechanism in place to evaluate compliance to colposcopy as the records at the screening clinics are not linked to those at the referral colposcopy clinics. The database at the BSMMU national co-ordinating centre showed that up to June 2008 a total of 5013 VIA-positive women had been identified through the programme and referred to the colposcopy units of the seven medical colleges and BSMMU. The total number of VIA-positive cases that attended these centres during the same period was 4371, giving a compliance rate of 87.2%. However, this is a rough estimate based on the periodic reports sent from the colposcopy units and the validity of the data could not be checked.

Evaluation of the referral colposcopy centre

Colposcopy is performed by gynaecologists with a postgraduate degree or diploma who are trained in colposcopy, cryotherapy and loop electrosurgical excision procedure (LEEP) at BSMMU. All the referred VIA-positive women undergo colposcopy. Punch biopsy is done if indicated. The patients are asked to return with the biopsy report for further management.

Of the referred patients who underwent colposcopy at BSMMU, 21.7% were found to be aged <30 years (Table 1). Though the national guidelines do not recommend screening for women aged <30 years, 23% (23/100) of all CIN 2/3 and 7.8% (6/77) of all cancers diagnosed at BSMMU were detected in this age group. However, only five cases of CIN 2/3 and one case of cancer were found in women aged <25 years. It is noteworthy that of the 77 cancers detected through the programme, 43 (57.8%) were at the early curable stage (i.e. Stage I-IIA). No information on the stage distribution of cervical cancer cases in Bangladesh prior to initiation of the screening programme is available. In the neighbouring country of India, with comparable socioeconomic conditions, the reported proportion of early-stage disease in the unscreened population is much lower.⁷ Despite the low coverage, however, the programme in Bangladesh has achieved a stage shift in invasive disease.

Treatment at the colposcopy clinic is decided upon on the basis of the biopsy report that is available after 4–12 days. Most of the women with CIN 1 are advised to undergo repeat colposcopy after 1 year. All CIN 2/3 cases are treated by LEEP under local anaesthesia at the clinic. Cryotherapy is practised very infrequently, primarily because the providers are not very familiar with the technique. The supply of gas cylinders (nitrous oxide) for cryotherapy is irregular in some of the centres and refilling is expensive.

Non-compliance to treatment is high. After colposcopy 16.2% patients did not return to BSMMU to collect their biopsy reports and thus remained untreated. Of those who

Table 1 Histology diagnosis by age group of the visual inspection after acetic acid application (VIA)-positive women who underwent colposcopy at Bangabandhu Sheikh Mujib Medical University (BSMMU)

Histology diagnosis	Age group (years)				Total
	<30	30–39	40–49	>49	
CIN 1	64	97	34	7	202
CIN 2	17	41	18	1	77
CIN 3	6	8	5	4	23
Cancer	6	27	21	23	77
No abnormality	180	453	182	63	878
Total	273	626	260	98	1257

CIN, cervical intraepithelial neoplasia.

returned and who had a diagnosis of CIN 2/3 on biopsy, only 52% opted to undergo treatment there. According to the records, very few of the treated patients returned for follow-up at the referral centre.

Discussion

It is evident from earlier observations that the major shortcomings of the programme are very low coverage of the target population and the poor compliance to treatment. Both these factors are crucial if the screening programme is to be able to reduce cervical cancer mortality and be cost effective. The encouraging fact is that the programme detected cervical cancers at an earlier stage compared to those reported from an unscreened population in a comparable setting. A similar stage shift of cervical cancers was noted in Thailand within 2 years of launching a VIA-based screening programme there.⁸

The monitoring and quality assurance plan for the national programme is unstructured and poorly defined, especially in terms of how frequently quality assurance should be done and by whom. The expected standards at various levels of service delivery conditions need to be delineated. Based on the evaluation findings, the study team defined the quality standards at different levels of service delivery and suggested how they might be achieved.

Considering the logistical constraints, it is impractical to fix a coverage rate within the present scenario. The number of women screened per centre per month has to increase significantly. A realistic target has to be set depending on the service delivery capacity of the individual screening centre. Extending the screening facilities to the rural health centres (e.g. Upazilla Health Complex) will ensure improved access to the programme for the rural population. The study team suggested that the community-level health workers should be briefed and actively involved in the programme so that they can educate the women and motivate them. Partnership with the non-governmental voluntary organisations working in the community, in addition to the involvement of religious, political and other peer groups, will improve the efficiency of the programme. Both electronic and print media should be utilised to disseminate information about the programme to the local population.

Looking at the performance of the programme up to now, repeat screening at 3-year intervals would appear to be impractical and too ambitious. The National Advisory Committee needs to consider increasing the screening interval to 5 years or perhaps even longer. Reducing the age range for screening to 25 years may detect a sizeable number of additional high-grade precursor lesions. However, this may not be cost effective for the programme as a whole, since including younger women will result in higher false positivity of VIA and increased detection of self-regressing low-grade precursor lesions.

In various research studies the positivity of VIA has ranged from 6.6% to 27.4%.^{3,9} In the Cervical Cancer Screening Programme of Bangladesh the VIA positivity has always been low at around 5%.² In centres where the VIA positivity is less than 5%, it is likely that the lesions are being missed and so refresher training should be considered for the providers.

The concordance between the VIA done by the providers at the screening clinics and the VIA performed by the colposcopist can be checked as a QA measure if the colposcopist repeats the VIA and records the finding before proceeding to do colposcopy. A good concordance (>80%) will assure the programme managers that VIA is being done appropriately.

The programme managers have to ensure that least 80% of VIA-positive women reach a colposcopy clinic within 1 month of referral in order to successfully link screening with

Table 2 Details of trained service providers involved in the National Cervical Cancer Screening Programme of Bangladesh

Designation	Basic qualification	Level at which service provided	Number trained
Medical officer	Medical graduate	District hospitals/MCWCS	98
Gynaecologist	Postgraduate in gynaecology/obstetrics	Medical college hospitals	44
Nurse	Nursing graduate	District hospitals/medical college hospitals	148
Family welfare visitor	Secondary education	MCWCS/primary health centres (rural)	152
Female paramedic	Secondary education	Urban primary health centres	32

MCWC, maternal and child welfare centre.

management.¹⁰ The compliance to colposcopy can be assessed only if the registers of the VIA-positive patients maintained at the screening centres are updated periodically. Such updating can be done by asking patients to report back to the screening centre after colposcopy or by contacting them by telephone or from the periodic feedback received from the referral colposcopy centre.

To improve the compliance to treatment the colposcopically detected high-grade lesions may be treated in the same sitting provided the patients are willing. Such a 'see and treat' policy has been widely advocated as a cost-effective strategy for low-resource set-ups.¹¹ 'See and treat' with cryotherapy, even by nurses under medical supervision, is acceptable, safe and effective for cervical cancer prevention in low-resource settings.¹² The overall cure rate of cryotherapy is 89.5%, almost the same as that of LEEP if appropriate selection criteria for cryotherapy are followed.¹³ Cryotherapy needs to be practised more frequently in order to specifically treat CIN lesions detected in the programme at the same visit as that for colposcopy. The programme managers thus have to ensure a regular supply of nitrous oxide gas at an affordable price.

Developing a competency-based teaching curriculum and training a critical number of service providers are two significant achievements of the programme. All training programmes are conducted at the national co-ordinating centre at BSMMU, Dhaka. The nurses, female paramedic staff and non-specialist clinicians are trained to perform VIA, and specialist gynaecologists are trained to do VIA, colposcopy and precancer management (Table 2). The total duration of the training course is 15–17 days, although this can be shortened to 10 days so that the trainees do not have to be away from their regular service for too long. All the trained VIA providers should be supervised by the trained clinicians for the first 6 months or till they have performed 50 VIAs, whichever is earlier. Training of pathologists and the pathology technicians needs to be integrated into the training programme also.

Conclusions

The limitations of the present evaluation study are as follows:

- The evaluation was done on the basis of observations of the activities of non-randomly selected samples of the centres where screening activities are ongoing. No nationwide data were available.
- The data on colposcopy and management were obtained from BSMMU, the national training and co-ordination centre, whose performance may not reflect the performance of other colposcopy centres.
- There was no structured way of collecting data before the evaluation and some of the essential information is missing.

The evaluation conducted an in-depth assessment of the VIA-based screening programme for the first time and formulated guidelines for ongoing quality assurance. There was not much heterogeneity observed among the screening centres evaluated in the various districts. It is likely that the

assessment of the selected sample more or less reflects the true picture of the national programme.

The VIA-based screening programme of Bangladesh has to be reorganised to improve its coverage. The frequency of screening can be increased to ensure more equitable utilisation of resources. A broad-based awareness and education programme will improve clinic attendances. The evaluation document suggested several modifications/improvements that need to be prioritised depending on feasibility, logistics and fiscal resources. The programme managers can set the immediate, short-term and long-term goals based on the recommendations and formulate an action plan in collaboration with all relevant stakeholders.

Statements on funding and competing interests

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Competing interests None identified.

References

- 1 Sankaranarayanan R, Bhatla N, Gravitt PE, Basu P, Esmey PO, Ashrafunnessa KS, et al. ICO Monograph Series on HPV and Cervical Cancer: Asia Pacific Regional Report. Human Papillomavirus Infection and Cervical Cancer Prevention in India, Bangladesh, Sri Lanka and Nepal. *Vaccine* 2008; **26S**: M43–M52.
- 2 Ahmed T, Ashrafunnessa KS, Rahman J. Development of a visual inspection programme for cervical cancer prevention in Bangladesh. *Reprod Health Matters* 2008; **16**: 78–85.
- 3 Sankaranarayanan R, Basu P, Wesley RS, Mahe C, Keita N, Mbalawa CC, et al.; IARC Multicentre Study Group on Cervical Cancer Early Detection. Accuracy of visual screening for cervical neoplasia: results from an IARC Multicentre Study in India and Africa. *Int J Cancer* 2004; **110**: 907–913.
- 4 Sankaranarayanan R, Esmey PO, Rajkumar R, Muwonge R, Swaminathan R, Shanthakumari S, et al. Effect of visual screening on cervical cancer incidence and mortality in Tamil Nadu, India: a cluster-randomised trial. *Lancet* 2007; **370**: 398–406.
- 5 Rahman A. Visual inspection aided with acetic acid: a feasible approach for cervical cancer screening in Bangladesh [Abstract 055(016)]. Abstract presented at the 12th ASCON Conference, Dhaka, Bangladesh, 9–12 February 2009.
- 6 Cervical and Breast Cancer Screening Programme Standards and Guidelines. Department of Obstetrics and Gynecology. Bangabandhu Sheikh Mujib Medical University, Dhaka, May 2007.
- 7 Jayant K, Rao RS, Nene BM, Dale PS. Improved stage at diagnosis of cervical cancer with increased cancer awareness in a rural Indian population. *Int J Cancer* 2006; **63**: 161–163.
- 8 Wilailak S. Epidemiologic report of gynecologic cancer in Thailand. *J Gynecol Oncol* 2009; **20**: 81–83.
- 9 Basu PS, Sankaranarayanan R, Mandal R, Roy C, Das P, Choudhury D, et al. Visual inspection with acetic acid and cytology in the early detection of cervical neoplasia in Kolkata, India. *Int J Gynecol Cancer* 2003; **13**: 1–7.
- 10 International Agency for Research on Cancer (IARC). *IARC Handbooks of Cancer Prevention, Volume 10: Cervix Cancer Screening*. Lyon, France: IARC Press, 2005.
- 11 World Health Organization (WHO). *Comprehensive Cervical Cancer Control. A Guide to Essential Practice*. Geneva, Switzerland: WHO Press, 2006.
- 12 Sankaranarayanan R, Rajkumar R, Esmey PO, Fayette JM, Shanthakumary S, Frappart L, et al. Effectiveness, safety and acceptability of 'see and treat' with cryotherapy by nurses in a cervical screening study in India. *Br J Cancer* 2007; **96**: 738–743.
- 13 Alliance for Cervical Cancer Prevention (ACCP). *Effectiveness, Safety, and Acceptability of Cryotherapy: A Systematic Literature Review (Cervical Cancer Prevention Issues In Depth No. 1)*. Seattle, WA: ACCP, 2003.