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# Evaluating primary care programmes: a problem-solving cycle with literature review on programme evaluation for cervical cancer screening at a community health centre, Jakarta, Indonesia

MUHAMMAD HABIBURRAHMAN[1, 2, 3, A–D, F, G], AFID BRILLIANA PUTRA[1, 2, A, D–F]
ORCID ID: 0000-0001-6372-8240 ORCID ID: 0000-0002-8985-5384

[1] Faculty of Medicine, Universitas Indonesia, Jakarta, Indonesia
[2] Dr. Cipto Mangunkusumo Hospital, Jakarta, Indonesia
[3] Faculty of Medicine, Imperial College London, London, United Kingdom

**A** – Study Design, **B** – Data Collection, **C** – Statistical Analysis, **D** – Data Interpretation, **E** – Manuscript Preparation, **F** – Literature Search, **G** – Funds Collection

**Summary** **Background.** Cervical cancer (CC) poses a significant burden on various aspects of public health, including overall well-being, social dynamics and economic factors.

**Objectives.** This report aimed to evaluate the effectiveness of a primary care programme focused on CC screening through the Visual Inspection with Acetic Acid (VIA) test at a community health centre (CHC) in urban South Jakarta, Indonesia.

**Material and methods.** We used a problem-solving cycle (PSC) approach to evaluate the programme's implementation and outcomes. This evaluation process included problem identification, situation analysis, root-cause determination using the Ishikawa diagram, prioritisation of problem-solving strategies based on the urgency, seriousness and growth (USG) and importance, technical feasibility and resource availability (ITR) matrix, as well as proposing recommendations for improvement using the magnitude, importance, vulnerability and cost (MIV/C) matrix.

**Results.** The low VIA test coverage at our CHC (13.39% in 2020) highlights the need for targeted interventions to increase participation. Inefficient implementation of the programme stems from various reasons (input, process and environmental factors). The solutions target root causes such as material, actuation and community response to improve CC screening. Inadequate knowledge, limited healthcare accessibility and socio-economic disparities hinder programme success. Despite these challenges, programme evaluation can enhance the level of community health, improve the quality of life, increase early CC case detection and reduce morbidity and mortality.

**Conclusions.** This study offers valuable insights and guidance for healthcare professionals in improving primary care programmes for CC screening. Future efforts should focus on addressing barriers and implementing targeted strategies to enhance programme effectiveness and reach.

**Key words:** uterine cervical neoplasms, early detection of cancer, community health centers, primary health care, program evaluation, vaginal smears.

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## Background

Cervical cancer has significant implications for public health, including overall well-being, social dynamics and economic factors. It primarily affects women of reproductive age, with a growing impact on younger age groups [1]. Cervical cancer is the fourth most prevalent cancer globally among women and the second in Indonesia. It ranks ninth in global mortality and third in Indonesia [2]. In Southeast Asia, there were 68,623 cases and 38,530 deaths from cervical cancer in 2020 [3]. The primary cause is human papillomavirus (HPV), particularly the high-risk subtypes responsible for about 70% of cases [4, 5]. Preventive measures include robust screening programmes, early diagnosis and timely treatment. However, implementing such programmes at the community level in Southeast Asia is challenging due to factors like inadequate knowledge, limited health promotion, limited healthcare access and socio-economic disparities. The social environment plays a role in shaping knowledge and practices related to early detection, such as visual inspection with acetic acid (VIA) [6–9].

Primary health care often serves as the initial point for cervical cancer screening, but it faces challenges such as inadequate screening, delays in diagnosis and treatment, outreach difficulties, limited information, long queues and distrust in health policies [10]. The World Health Organization has implemented efforts for early detection using HPV DNA testing; however, this can be costly for developing countries [11, 12]. In developing countries, VIA or cytology (Pap smear) is commonly used for community-based screening [13, 14]. In Indonesia, VIA is most often used due to its cost-effectiveness [15–18]. National VIA examinations in Indonesia yielded 50,171 positive cases, with 5,847 suspected cases of cervical cancer. However, the national coverage rate for VIA screening among women aged 30–50 is only 8.3% [19]. At a community healthcare centre (CHC) in South Jakarta, the VIA screening realisation rate was approximately 13.39% in 2020 [20]. The significant gap between targets and realisations calls for an evaluation of the VIA screening programme in the CHC.

Health programme evaluation in primary health care and CHCs is vital for assessing effectiveness and achieving positive

health outcomes. Programme evaluation helps health professionals understand the impact of their initiatives, secure funding and identify areas for improvement. However, there is a lack of comprehensive literature on evaluation in primary health care, particularly regarding systematic processes like problem-solving cycles (PSCs) [21].

## Objectives

To bridge this research gap, our case study aims to provide an overview of programme evaluation, step-by-step guidance on community-based evaluations in health centres and a practical framework for health professionals. We use examples from our experience to illustrate the evaluation of a cervical cancer screening programme. Our evaluation focuses on identifying problems and root causes, prioritising solutions and proposing recommendations. Specifically, we conduct a root cause analysis to understand why the VIA testing programme does not achieve a 100% reach of women of reproductive age within the purview of the CHC. This analysis will guide effective changes to improve health outcomes, enhance early detection of cervical cancer and reduce associated morbidity and mortality [21].

## Material and methods

### Study design and tools

This article presents a comprehensive framework and guidance for health professionals to conduct meaningful programme evaluations. The authors use a single-centre case study and discuss the PSC as a practical study design. The framework emphasises the distinction between programme evaluation and research and encourages health professionals to make value judgments on a programme's quality, worth and significance. Real-life examples from the authors' experience are provided to illustrate the application of programme evaluation in health care.

The PSC concept, depicted in Figure 1, consists of ten stages: situation analysis, problem identification and its prioritisation, identification of root causes and their prioritisation, identification of alternative solutions and their prioritisation, as well as the implementation, monitoring and evaluation of solutions.

1. The PSC involved a situation analysis, gathering data and identifying key factors, root causes and problem impact to inform decision-making and develop targeted solutions [27].
2. Problem identification measured the gap between target and realisation, prioritising problems using the urgency, seriousness and growth (USG) matrix [28, 29]. The USG matrix employed a scale score of 1–5 for each component, which is then summed. The minimum total score was 3, and the maximum score was 15. Higher USG levels corresponded to higher scores in each element. 'Urgency' referred to the time required for problem resolution, 'seriousness/severity' related to the impact on productivity, safety and resources, while 'growth' indicated the progression of the problem [27–30].
3. Root causes were explored using fishbone analysis or Ishikawa diagrams, then prioritised using the decision matrix (I x T x R: importance, technical feasibility and resources availability) [31, 32].
4. Solutions to address root causes were identified and prioritised using the $\frac{M \times I \times V}{C}$ method, considering the magnitude, importance, vulnerability and cost. The *M*, *I*, *V* and *C* factors were used to assess the solutions. *M* measured the problem's significance and the solution's ability to resolve it, *I* evaluated the solution's permanence, *V* assessed its accuracy and speed, and *C* considered the cost. Each factor was scored on a scale of 1–5 based on effectiveness [33, 34].
5. The cycle included solution implementation, monitoring and evaluation, returning to the initial stage for further analysis. Implementation details were not covered in this study. However, in this study, we only discussed programme evaluations and proposed alternative solutions to solve the problem (until the fourth main stage), without delving into the implementation of the solutions [22–24, 26, 35].

### Data resources

Primary data was collected through interviews with key personnel at the CHC, including the CHC head, the coordinator of the non-communicable disease programme and healthcare providers involved in the VIA test. Secondary data was sourced from the CHC's 2020 annual report. Data analysis took place from August to October 2021.

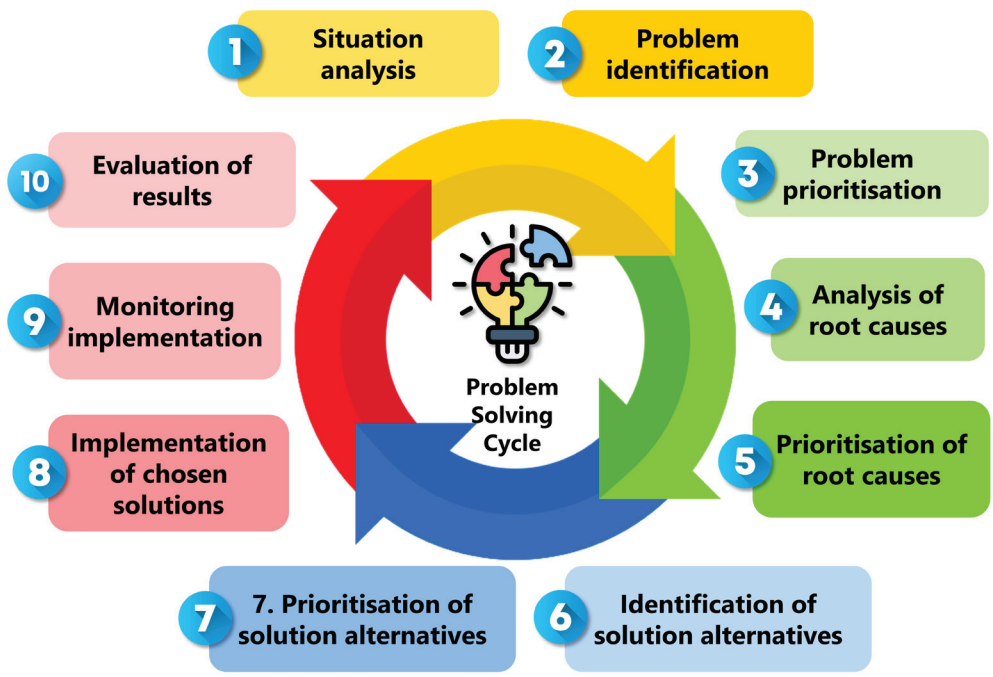


**Figure 1.** Problem-solving cycle concept [22–26]

### Ethical considerations

Ethical clearance was not required, as this evaluation did not involve human participants. The focus of the evaluation is to provide useful information for decision-making and programme improvement. The case study was conducted in a CHC in South Jakarta, DKI Jakarta, Indonesia, with specific details concealed. The work was carried out with permission from the institution and aligned with the Utilisation of Newly Graduated General Practitioners in primary care during the COVID-19 Pandemic 2021 programme, under Letter No. DG.02.04/2.1/25292/2021 from the Ministry of Health, Republic of Indonesia.

## Results

We presented a case study from a CHC, Jakarta. This case study explores the challenges involved in evaluating a health programme not achieving the required target, specifically the failure to achieve the target for cervical cancer screening using the VIA test. The authors highlight the significance of achieving optimal coverage in future programme implementations.

### Situation analysis

This study focuses on a specific urban village within a designated sub-district, comprising 24,945 individuals and representing 29.0% of the entire sub-district's population. The sub-district, located in the South Jakarta region, is characterized by a female population totaling 86,044 (the names of the urban village and sub-district are anonymized) [20]. In Jakarta, the capital of Indonesia, the population of women of reproductive age was 2,578,385 in 2020, with 236,771 (9.2%) residing in South Jakarta [36]. The World Health Organization (WHO) aims for 70% of women 35–45 years of age to be screened for cervical cancer by 2030 [37, 38], while the Technical Guidelines for Cancer Control in Indonesia (2010) target women 30–50 years of age for screening every 5 years, aiming for 50% inspection coverage by 2019 [39, 40]. Early detection activities employ passive and active approaches, with regular activities at health centres and clinics, as well as specific events in various locations. Primary healthcare settings implement a VIA test-based screening programme for pre-cancerous lesions, offering cryotherapy for positive VIA findings. In case of negative results, the screening test can be repeated every 3–5 years, and annual periodic examinations are recommended for specific cases [40]. Factors influencing cervical screening in Indonesian urban communities include education level, gender, age and employment status [7]. National cervical cancer screening coverage in Indonesia was only 12% among women 30–50 years of age in 2020 [41]. Barriers to screening include limited information, socio-economic status, lack of health insurance and accessibility challenges. Geographic and population diversity, as well as differing health beliefs, further impact screening programme success [42].

### Identification of problems in the healthcare programmes and services

In the initial stage of the PSC, gaining a comprehensive understanding of the problems in the programmes of this public health centre is crucial. Among the analysed programmes, five showed significant gaps between intended targets and realised outcomes (Table 1). For example, the VIA test for women had a gap of -86.6%, while new leprosy cases had a gap of -72.8%. Positive acid-fast bacilli (AFB+) tests in tuberculosis cases showed a gap of -68.7%. Additionally, public health services for elementary schools had a gap of -63.2%, and standard services for suspected tuberculosis patients had a gap of -62.4%.

**Table 1. Performance indicator targets and realisations of health programmes at a community health centre in South Jakarta, Indonesia**

| No. | Programme | | Health indicators | Target (%) | Realisation (%) | Gap (%) |
|---|---|---|---|---|---|---|
| 1. | Health promotion | | Household that maintains a clean and healthy lifestyle | 100 | 55.7 | -44.3 |
| 2. | Tuberculosis and leprosy | 2.1. | TB case detection with positive AFB tests | 100 | 31.3 | -68.7 |
| | | 2.2. | Provision of standard services for suspected TB patients | 100 | 37.6 | -62.4 |
| | | 2.3. | TB conversion rate | 100 | 80.0 | -20.0 |
| | | 2.4. | TB cure rate | 100 | 40.0 | -60.0 |
| | | 2.5. | Discovery rate of new leprosy cases (case detection rate) | < 5/100,000 | 18.39/100,000 | -72.8 |
| 3. | Immunisation | 3.1. | Immunisation month for school children – DT vaccine | 95 | 35.8 | -59.2 |
| | | 3.2. | Immunisation month for school children – Td vaccine | 95 | 40.0 | -55.0 |
| | | 3.3. | DPT booster | 95 | 61.4 | -33.6 |
| | | 3.4. | MR booster | 95 | 57.7 | -37.3 |
| 4. | **Non-communicable diseases** | 4.1. | Health screening for people 15–59 years of age | 100 | 50.4 | -49.6 |
| | | 4.2. | Health services for hypertension | 100 | 42.1 | -57.9 |
| | | 4.3. | Health services for diabetes mellitus | 100 | 71.6 | -28.4 |
| | | **4.4.** | **VIA test and CBE for women of reproductive age** | **100** | **13.4** | **-86.6** |
| 5. | Women's health | 5.1. | Management of complications during pregnancy | 100 | 98.3 | -1.7 |
| | | 5.2. | Delivery assistance provided by healthcare professionals | 100 | 91.1 | -8.9 |
| | | 5.3. | Postpartum visits | 100 | 91.1 | -8.9 |

**Table 1. Performance indicator targets and realisations of health programmes at a community health centre in South Jakarta, Indonesia**

| No. | Programme | | Health indicators | Target (%) | Realisation (%) | Gap (%) |
|---|---|---|---|---|---|---|
| 6. | Reproductive health | | Contraceptive prevalence rate | 100 | 39.8 | -60.2 |
| 7. | Nutrition | 7.1. | Measurement of toddler weight | 60 | 33.3 | -26.7 |
| | | 7.2. | Supplementary feeding for pregnant women with chronic energy deficiency | 80 | 55.6 | -24.4 |
| | | 7.3. | Monitoring of weight gain in toddlers | 80 | 39.4 | -40.6 |
| | | 7.4. | Monitoring of weight loss or insufficient weight gain in toddlers | < 4 | 11.9 | -7.9 |
| 8. | Environmental health | | Food processing sites complying with health standards | 95 | 53.3 | -41.7 |
| 9. | School medical room establishment | 9.1. | Elementary school | 100 | 36.8 | -63.2 |
| | | 9.2. | Junior high school | 100 | 56.3 | -43.7 |
| | | 9.3. | Senior high school | 100 | 49.0 | -51.0 |

**Notes:** Bold letters on a grey background indicate the programme with the largest gap from the target.
**Abbreviations:** AFB – acid-fast bacillus, TB – tuberculosis, DT and Td – diphtheria and tetanus vaccine, DPT – diphtheria, tetanus and pertussis vaccine, MR – measles and rubella vaccine, VIA – visual inspection with acetic acid, CBE – clinical breast examination.

**Table 2. Prioritisation of high-gap health programmes**

| Programme category | Indicators | U | S | G | Total score |
|---|---|---|---|---|---|
| Tuberculosis and leprosy | TB case detection with positive AFB tests | 4 | 4 | 5 | 13 |
| Tuberculosis and leprosy | Provision of standard services for suspected TB patients | 4 | 4 | 5 | 13 |
| Tuberculosis and leprosy | Discovery rate of new leprosy cases (case detection rate) | 5 | 3 | 4 | 12 |
| **Non-communicable disease** | **VIA test and CBE for women of reproductive age** | **5** | **5** | **5** | **15** |
| School Public Health | School medical room establishment | 4 | 2 | 2 | 8 |

**Notes:** Bold letters on a grey background indicate the prioritised programme to be evaluated. Objective criteria for USG matrix assessment based on literature and clinical judgment [29, 30].
**Urgency criteria:** scores are 5 if the gap is > 70%; 4 if the gap = 50–70%; 3 if the gap = 30–50%; 2 if the gap is < 30%; and 1 if the target has been achieved. **Seriousness criteria:** according to morbidity and mortality, scores are 5 if very high; 4 if high; 3 if moderate; 2 if low; and 1 if the target has been achieved. **Growth criteria:** according to incidence rate/prevalence rate/mortality rate, scores are 5 if very high; 4 if high; 3 if moderate; 2 if low; and 1 if the target has been achieved.
**Abbreviations:** AFB – acid-fast bacillus, TB – tuberculosis, VIA – visual inspection with acetic acid, CBE – clinical breast examination.

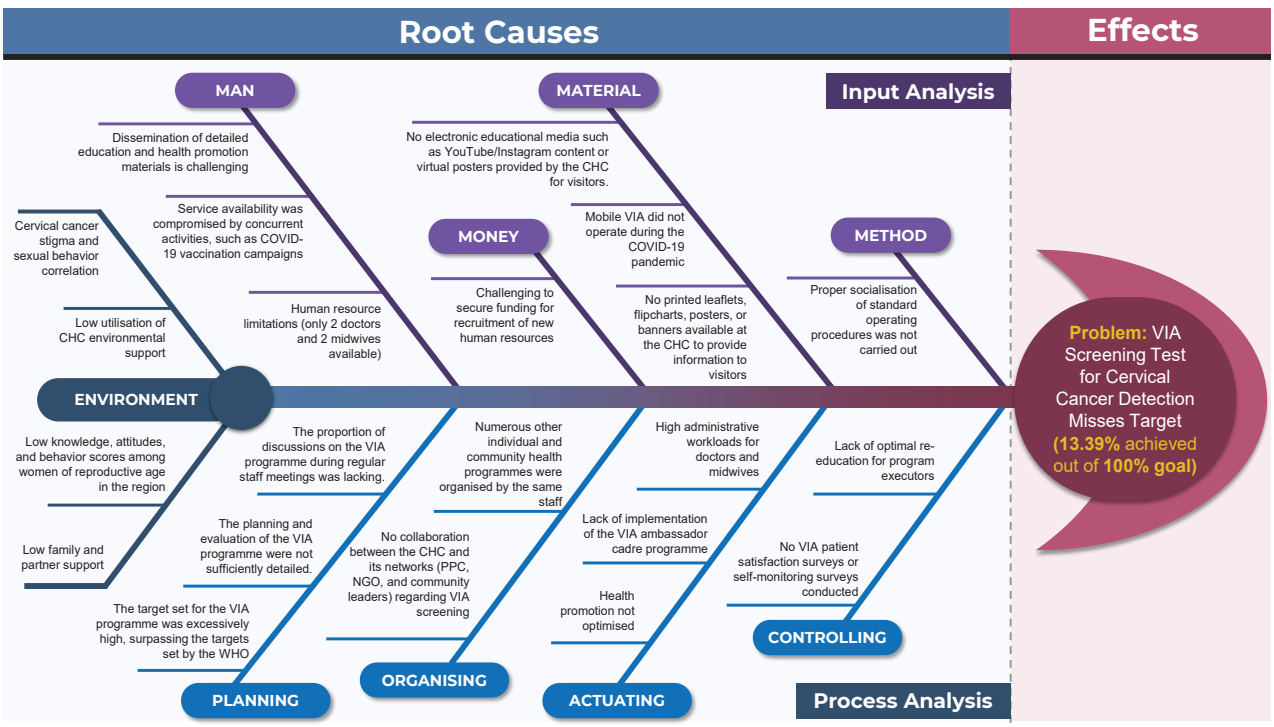


**Figure 2.** Fishbone framework that describes the various root causes of low VIA test coverage at the community health centre in 2020

**Abbreviations:** CHC – community health centre, NGO – non-government organisation, PCP – primary care physicians, VIA – visual inspection with acetic acid, WHO – World Health Organization.

## Prioritisation of problems in the healthcare system

The identification of programmes with the largest gaps indicates implementation issues. As illustrated in Table 2, the VIA programme had the highest USG score due to the urgent need to improve the early detection of cervical cancer through the VIA test. Cervical cancer has significant morbidity and mortality rates globally and in Indonesia.

Cervical cancer primarily affects women of reproductive age, with a rising incidence rate. In Jakarta, the incidence rate was 9.25 per 100,000 women [43], ranking second in Indonesia with a national incidence rate of 24.4/100,000 individuals [2]. The VIA test requires medical personnel, while breast self-examination can be performed independently for breast cancer screening.

## Framework and root cause analysis of the prioritised problem

After identifying the problem of failure to attain the target of the VIA test programme, the next step is conducting a fishbone analysis. The fishbone diagram is a visual tool used to identify potential causes of programme implementation failure. It consists of a problem box, a central line as the spine and diagonal lines branching off to represent cause groupings. Causes within each grouping are identified through brainstorming sessions [44, 45]. The fishbone analysis in our case study (Figure 2) revealed challenges which were faced by the health centre during the COVID-19 pandemic, including lack of coordination between healthcare professionals and community health cadres, overwhelmed healthcare workers, limited coordination with private midwives and limited awareness in the society on HPV infection and cervical cancer. Inadequate socialisation efforts also contributed to the struggle of the CHC to maintain the VIA test programme [46].

## Prioritisation of root cause to the prioritised problem

In the next step of the PSC, root causes were prioritised using an ITR matrix. Table 3 highlights the prioritised causes, including one issue related to input and material, three issues regarding process and actuation, and four issues associated with environmental aspects. The low coverage of VIA tests was primarily attributed to the absence of sustainable educational media or platforms for dissemination, challenges in implementing education within outpatient services due to patient queues, lack of counselling about the importance of the VIA test and the vast geographical area.

**Table 3. Root causes prioritisation of unachieved coverage of visual inspection with acetic acid testing**

| No. | Category | Subcategory | Causes of the problem | *I* | *T* | *R* | *I* x *T* x *R* |
|---|---|---|---|---|---|---|---|
| 1. | Input | 1.1. Man | The limited availability of trained healthcare professionals for the VIA test, with only 2 doctors and 2 midwives, resulted in various challenges, such as:<br>• Whenever numerous public health programmes were scheduled, particularly vaccine-related initiatives, the VIA service needed to be reduced or temporarily suspended to accommodate the increased workload.<br>• Difficulties arose in effectively conveying detailed education and health promotion messages related to the VIA test. | 4 | 2 | 2 | 16 |
| | | 1.2. Money | There were challenges in applying additional funds for the recruitment of human resources during the COVID-19 pandemic. | 2 | 2 | 2 | 8 |
| | | 1.3. Material | **1.3.1. The accessibility of educational facilities regarding VIA tests and cervical cancer for visitors was insufficient. Specifically, there was a lack of printed materials such as leaflets, flip charts, posters and banners. Additionally, electronic educational media platforms, including YouTube content, Instagram content or digital posters, were not available to disseminate information effectively.** | **5** | **5** | **5** | **125** |
| | | | 1.3.2. During the COVID-19 pandemic, the mobile VIA test was not operational, despite its potential to expand coverage among individuals who were hesitant to visit the community health centre. Despite the favourable function and benefits it offered, the mobile VIA test was temporarily halted due to the prevailing circumstances. | 4 | 3 | 2 | 24 |
| | | 1.4. Method | The standard operational procedure for early detection of cervical cancer using the VIA test had not been effectively socialised. Specifically, there were gaps in disseminating information about who was eligible to undergo the test as a target population, the optimal timing for the test (such as whether it could be done during an IUD placement or when checking vaginal discharge) and the necessary steps involved in the procedure. | 3 | 3 | 3 | 27 |
| 2. | Process | 2.1. Planning | 2.1.1. There was a lack of detailed planning regarding efforts to enhance VIA detection. | 4 | 3 | 3 | 36 |
| | | | 2.1.2. There has been a lack of comprehensive evaluation of the root cause behind the low VIA detection. | 4 | 3 | 3 | 36 |
| | | | 2.1.3. The frequency of periodic meetings was not optimal for addressing the issues related to low-coverage programmes. | 3 | 2 | 2 | 12 |

**Table 3. Root causes prioritisation of unachieved coverage of visual inspection with acetic acid testing**

| No. | Category | Subcategory | Causes of the problem | *I* | *T* | *R* | *I* x *T* x *R* |
|---|---|---|---|---|---|---|---|
| | | | 2.1.4. The target percentage set at 100% was considered excessively high compared to the WHO target (70%). | 3 | 2 | 2 | 12 |
| | | 2.2. Organizing | 2.2.1. The management of many public health and individual health programmes hindered the adequate organisation of the VIA test programme. | 4 | 3 | 3 | 36 |
| | | | 2.2.2. Insufficient coordination and collaboration among community health centres, midwife practices, primary health centres and obstetrics and gynaecology clinics limited the efforts to increase the coverage of VIA tests in private practices. | 5 | 3 | 3 | 45 |
| | | 2.3. Actuating | 2.3.1. The workload for the doctor in charge of the programme and the midwife was substantial, including data computation and entry on patients' reproductive health status. The workload was further exacerbated during the pandemic with the additional responsibilities related to vaccination and 3T (tracing, testing and treatment). | 4 | 2 | 2 | 16 |
| | | | **2.3.2. The VIA ambassador cadre programme, designed for each village, did not effectively function during the pandemic, and there were no technical guidelines available.** | **5** | **5** | **5** | **125** |
| | | | **2.3.3. Long patient queues, caused by waiting time and service demand, resulted in limited time for cervical cancer education and VIA tests.** | **5** | **5** | **5** | **125** |
| | | | **2.3.4. Inadequate counselling about the VIA test and cervical cancer was observed.** | **5** | **5** | **5** | **125** |
| | | 2.4. Controlling | 2.4.1. The efforts to re-educate programme implementers and those in charge were not optimised. | 4 | 4 | 5 | 80 |
| | | | 2.4.2. There were no satisfaction surveys or patient self-monitoring surveys specifically focused on the aspects of early detection of cervical cancer through VIA tests. | 3 | 3 | 3 | 27 |
| 3. | Environment | Environment and community response | **The community displayed a lack of knowledge, attitudes and behaviours regarding the early detection of cervical cancer.** | **5** | **5** | **5** | **125** |
| | | | **There was a lack of concern among families and family members regarding the risk of cervical cancer and the vulnerability of women to it. Husbands also lacked understanding about cervical cancer and VIA, resulting in their failure to recommend routine check-ups for their partners.** | **5** | **5** | **5** | **125** |
| | | | **Health stigma surrounding cervical cancer and its association with unsafe sexual practices persisted.** | **5** | **5** | **5** | **125** |
| | | | **The potential of large geographical areas to be utilised for health promotion and education related to cervical cancer and VIA tests remained untapped.** | **5** | **5** | **5** | **125** |

**Notes:** Bold letters on a grey background indicate prioritised issues.
**Importance:** Range 1–5 (less to very important). **Technical feasibility:** Range 1–5 (easy to difficult). **Resource availability:** range 1–5 (unavailable to highly available). **Abbreviations:** IUD – intrauterine device, VIA – visual inspection with acetic acid, WHO – World Health Organization.

## Solution alternatives of the prioritised problem

As part of the PSC, simultaneous solutions are proposed to restore operational excellence. Inadequate VIA screening education can be due to the small number of employees allocated to the programme. Workload and patient overload can be addressed by eliminating excessive workload or balancing it. Increasing the availability of educational facilities and media seems to currently be the most effective solution [47]. Proposed solutions include enhancing educational resources, collaborating with external entities, revitalising the VIA Ambassador Cadre programme and exploring the reactivation of the mobile VIA programme. Implementing these solutions can significantly improve the early detection of cervical cancer and reduce associated burdens [47].

## Prioritisation of the solution to the prioritised problem

Prioritising solutions using the MIV/C matrix is crucial. Table 4 presents the prioritised problem-solving strategies, focusing on enhancing cervical cancer early detection programmes. The recommended strategies for addressing low VIA test coverage, resistance and cost-effectiveness are outlined in Figure 3. Based on the analysis, the most effective solutions were (1) enhancing educational facilities and media for VIA test awareness; (2) collaborating with third parties to boost cervical cancer awareness and prevention; and (3) restoring the functionality of the "VIA Ambassador Cadre" programme.

**Table 4. Prioritisation of alternative solutions to increase cervical cancer screening coverage**

| No. | Solution | Description of detailed solution | *M* | *I* | *V* | *C* | *MIV/C* |
|---|---|---|---|---|---|---|---|
| 1. | Improving educational facilities and media platforms to amplify knowledge, awareness and public understanding of the VIA test | 1.1. Designing and displaying posters in waiting rooms and examination rooms that effectively communicate the risks associated with cervical cancer, emphasise the importance of early detection, eliminate the stigma surrounding the disease and provide information on the HPV vaccine. | 4 | 4 | 3 | 3 | 16 |
| | | 1.2. Developing concise flip-charts to be distributed to each woman undergoing a VIA test, ensuring they receive relevant and easily understandable information. | 4 | 4 | 3 | 3 | 16 |
| | | **1.3. Offering educational videos and audio materials to the general public, covering topics such as the dangers of cervical cancer, the significance of early detection, procedures involved in VIA testing, efforts to eradicate stigma and information on the HPV vaccine.** | **5** | **5** | **4** | **2** | **50** |
| | | **1.4. Utilising the waiting room television to broadcast educational videos, effectively utilising visual media to disseminate important information.** | **5** | **5** | **4** | **2** | **50** |
| | | **1.5. Optimising the sound system by playing educational audio recordings on a loop, maximising the potential for information absorption among individuals in the waiting area.** | **5** | **5** | **4** | **2** | **50** |
| | | **1.6. Establish a health education WhatsApp and/or Facebook group as a means of delivering crucial messages to a wider audience.** | **5** | **5** | **4** | **2** | **50** |
| | | **1.7. Developing Instagram, TikTok, Twitter (X) and/or YouTube channels dedicated to education and communication, allowing for the dissemination of information and encouraging engagement with the target population.** | **5** | **5** | **4** | **2** | **50** |
| | | 1.8. Implementing periodic counselling sessions via Zoom or Google Meetings, facilitating virtual health promotion, and inviting participation from community leaders and mothers of reproductive age. | 5 | 4 | 4 | 2 | 40 |
| | | **1.9. Enhancing the knowledge of community health cadres (volunteer workers) to effectively provide information and encourage women of reproductive age to undergo the VIA test at community health centres.** | **5** | **5** | **4** | **2** | **50** |
| 2. | Establishing collaborative relationships with relevant third parties to enhance the effectiveness and impact of the cervical cancer awareness and prevention campaign | 2.1. Collaborating with government organisations and non-governmental organisations (such as The National Cervical Cancer Coalition, The National Family Planning Organisation, The Cancer Foundation, Women's Health Institutions, The National Cancer Centre, Secondary Hospitals or Referral Hospitals, Medical Schools and Banks) as potential sponsors to facilitate the organisation of large-scale VIA tests and provide training for healthcare cadres. | 4 | 3 | 3 | 3 | 12 |
| | | 2.2. Engaging in collaboration with Consultant Gynaecological Oncologist or Obs&Gynae Specialist Doctor to deliver community services through Instagram talks specifically targeted at young women. | 3 | 3 | 3 | 3 | 9 |
| | | **2.3. Establishing partnerships with midwives, primary healthcare providers and Obs&Gynae clinics to expand the reach of IVA tests and employ alternative methods for cervical cancer detection.** | **5** | **5** | **4** | **2** | **50** |
| 3. | Restoring the functionality of the "VIA Ambassador Cadre" programme | **Revitalising the "VIA Ambassador Cadre" programme by clearly defining the responsibilities and SOPs that these cadres need to fulfil within their communities, including identifying and bringing eligible patients for a monthly VIA test. This approach will ensure effective community engagement and support in promoting VIA testing and awareness.** | **5** | **5** | **4** | **2** | **50** |
| 4. | Re-establishing the operational status of the mobile VIA programme | Endeavouring to reinstate the VIA mobile programme to enhance accessibility and reach in providing VIA testing services in remote or underserved areas. | 5 | 3 | 3 | 5 | 9 |

**Notes:** Bold letters on a grey background indicate prioritised solutions.
*M* – magnitude, *I* – importance, *V* – vulnerability, *C* – cost. Each component has a score of 1–5 according to the degree of effectiveness.
**Abbreviations:** HPV – human papillomavirus, Obs&Gynae – obstetrics and gynaecology, SOP – standard operating procedure, VIA – visual inspection with acetic acid.

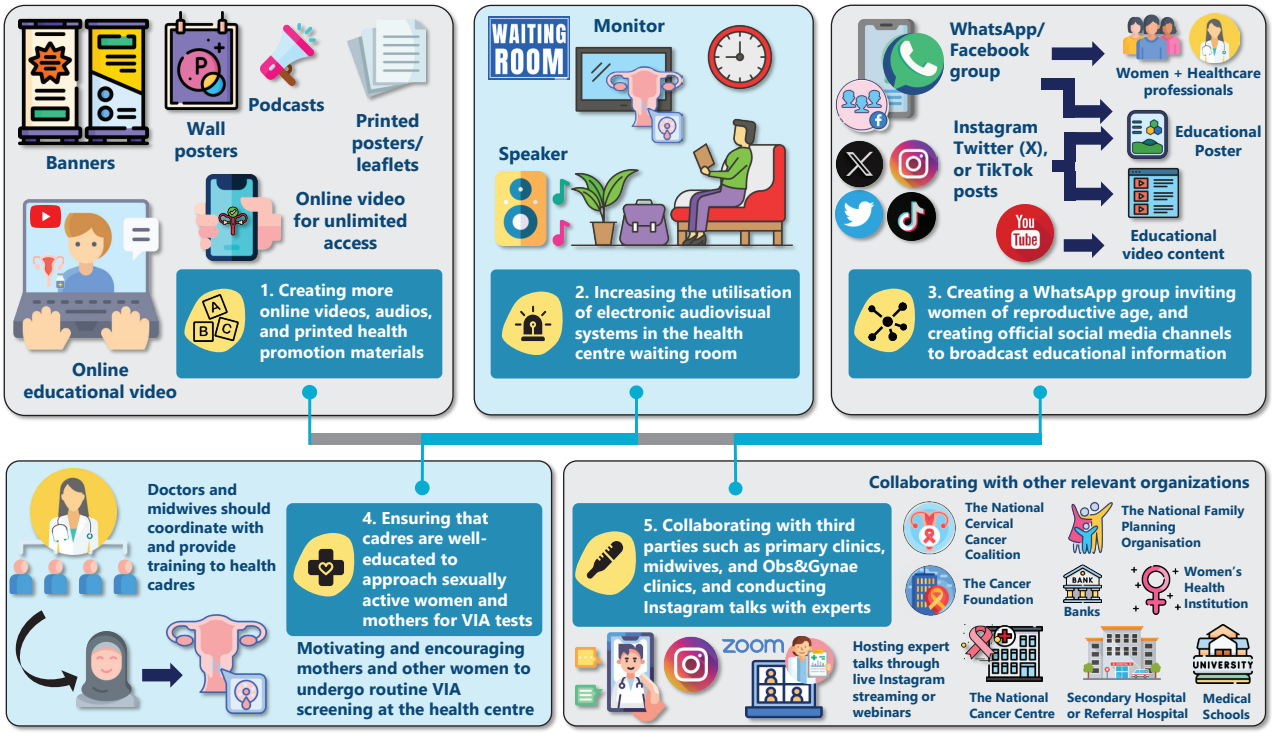


**Figure 3.** Recommended solutions to be implemented

**Abbreviations:** Obs&Gynae – obstetrics and gynaecology, VIA – visual inspection with acetic acid.

## Discussion

### Defining programme evaluation and its distinction from research

Programme evaluation is challenging due to its variable nature and the methods used. It involves systematically assessing the value and significance of a programme. Process evaluations are essential for understanding the interplay between complex interventions and organisational contexts. In this study, we advocate using the PSC approach for evaluating programmes in smaller-scale healthcare facilities. The theoretical framework employed incorporates key principles of the philosophy of science, including consilience, simplicity and analogy. It is important to differentiate between research and evaluation, as the latter requires specialised skills and training. Unfortunately, many reported "programme evaluations" lack clear methodologies, limiting the assessment of programme quality and value. This article presents a framework that enables evaluators to determine a programme's merit, worth and significance, highlighting the need for specialised evaluation skills and methodologies [48].

### Role of problem-solving cycle concept to provide better health programme

In 1987, the WHO recommended student engagement in community-based problem-solving for health promotion practice [49]. The PSC approach is commonly used for health improvement research, consisting of steps to identify the problem, find its root cause, develop alternative solutions, implement policies and evaluate performance [50]. Root cause analysis (RCA) aims to understand current situations, reasons behind outcomes and preventive measures for future occurrences [51]. The choices of methods used for RCA include process mapping, Pareto charts, key-driver diagrams and fishbone analysis (Ishikawa diagrams) [45, 51]. Process mapping helps identify improvement opportunities in complex systems, while Pareto charts prioritise common causes of quality issues. Key-driver diagrams enhance the chances of success in implementing changes by illustrating the relationship between aim statements and drivers. The fishbone/Ishikawa diagram visually displays potential root causes and facilitates team discussions. It is a graphical tool used to analyse and assess programme efficiency [27, 52]. It helps identify causes and sub-causes through brainstorming among healthcare professionals. These methods have been applied in various health fields, including evaluating medicine [53, 54], telemedicine frameworks [55], HIV prevention programmes [21] and patient satisfaction [56]. This diagram is particularly useful for depicting interconnected factors in complex situations.

The fishbone diagram is a comprehensive assessment tool that uncovers the underlying causes of programme process problems [57]. It consists of nine main categories, including manpower, method, materials, money, equipment, planning, management, process and controlling [58, 59]. In our study, we used the fishbone diagram to identify and analyse the root causes of the low VIA test rate in a CHC in South Jakarta. This graphical representation helps us categorise the challenges of VIA testing in a clear and simplified manner. The fishbone diagram is a versatile technique that has been utilised in prior studies, such as in the field of medicine to drive radical innovations in targeted therapy for oncology [60].

While the fishbone diagram is a valuable tool, it has limitations. It may not accurately measure the magnitude of each reason within subcategories and is often limited to academic or scientific settings. It may struggle to identify the specific root cause, as all causes appear equally significant and can highlight insignificant factors. Additionally, its conclusions are subjective rather than evidence-based [51]. To address these limitations, the fishbone diagram is complemented by other tools in the PSC approach, such as the USG matrix or ITR matrix, which aid in prioritising root causes. Ultimately, the MIV/C matrix is used to determine the most effective and efficient solution [53, 59].

### The importance of programme evaluation for VIA testing success in primary health care

Primary health care plays a critical role in healthcare systems, improving accessibility, health outcomes and reducing

hospitalisations [61]. Collaboration among healthcare professionals is essential for a strong primary healthcare programme [62]. Stakeholder engagement, process mapping and problem-solving are vital for effective programme evaluation and implementation [63]. Evaluating and monitoring health programmes, such as VIA and cryotherapy for precancerous lesions, is necessary to achieve the expected outcomes and securing funding.

The PSC is a valuable approach for evaluating health programmes [15–18]. Lack of educational equipment was identified as a critical problem in our case study. Acquiring and utilising suitable equipment is essential for successful programme implementation [59, 64]. However, the management and distribution of educational materials in the CHC in this case study were found to be ineffective, lacking sustainability and efficiency similar to the findings in the previous studies [59, 65]. Factors contributing to poor materials management include the unavailability of necessary materials, especially in clinics frequently visited by women. Addressing these issues is crucial for proper materials management and effective dissemination of information about VIA testing [59, 64].

Upon closer examination of the case study, inefficient workload management during the COVID-19 pandemic is a major cause of inadequate VIA testing in our CHC. Similar findings have been observed in studies conducted in England [66], Denmark [67] and the USA [68], where reduced invitations for cervical screening led to lower attendance rates and fewer cancer diagnoses. Laboratories also reported a significant decrease in received samples during the pandemic [66]. In Denmark, the reduction in cervical cancer screening coverage was as high as 62% [67], while in the USA, it reached 80% [68]. The disruption of healthcare services due to COVID-19 is expected to result in a higher number of cervical cancer diagnoses during the recovery phase [69]. Limited access to primary health care, reduced treatment capacity in hospitals, decreased availability of screening and diagnostic services and women avoiding screening due to COVID-19 fears are the main reasons for this increase [70]. Motivating and guiding employees is crucial for the success of the CHC, particularly during the pandemic. A comprehensive training campaign can be initiated to develop their skills and boost motivation. Rather than hiring new staff, seeking talented individuals from within the health center can enhance innovation. Involving employees in decision-making fosters a sense of ownership and commitment. Offering incentives and maintaining work schedules and standards further reinforces employee commitment [59, 64]. Additionally coordination among employees is essential, and a clear definition of individual responsibilities is important for maintaining VIA testing operations. In the end collaboration with the health promotion team and establishing networks with experts at secondary-level hospitals can be encouraged to enhance community engagement. These measures increase the likelihood of employee contribution to the programme's success.

In this case study, the VIA Ambassador Cadre programme, as a part of the efforts of community health workers (CHWs), faced challenges in its implementation, including a lack of technical guidelines and role clarity between programme navigators and CHWs. The process execution was poor, with long patient queues and limited time for education and VIA tests. Moreover, in the CHC, counselling on VIA tests and cervical cancer was also lacking. Therefore, a well-structured process is essential for synergy and achieving targeted goals in primary healthcare services [59, 71]. On the other hand, staff motivation and understanding of roles are crucial for programme success [59, 65]. However, during the COVID-19 pandemic, staff at the CHC faced challenges that hindered effective programme implementation. These issues cannot be instantly resolved, impacting the programme's goals and undermining the reputation of primary healthcare services to reliably gatekeep cancer screening efforts. Therefore, establishing effective management is essential for addressing these challenges and achieving programme goals [59, 64].

Creating a conducive and supportive environment is crucial for the successful implementation of healthcare programmes within a community, considering the various characteristics of patients and society [59, 65]. However, in our case study within the scope of the CHC, we observed that the female population had a low level of knowledge, attitude, and practice (KAP) regarding cervical cancer screening, similar to what was identified in a prior study conducted by Winarto et al. [7] in Jakarta, Indonesia. Family members also showed little concern or recommendations for routine check-ups. This hindered programme implementation and progress. Reasons for these challenges included ignorance, resistance towards screening, reluctance to be examined by male providers, lack of support from husbands, stigmatisation and personal anxiety. Prior studies discussed how patients' or subjects' characteristics, such as their needs, interests and values, can impact the implementation and adoption of navigation programmes [72]. Patients' hesitation and anxiety can be reduced by having solely female clinicians perform pelvic examinations and/or having male examiners be chaperoned by a female partner or clinic attendant present when a male healthcare provider is involved [73].

Overall, inadequate materials, implementation challenges, limited collaboration, unsupportive community response and lack of understanding about cervical cancer have hindered the CHC's ability to achieve desired screening coverage and meet targets.

## Alternative solutions to inadequate VIA testing coverage: a problem-solving approach

Community-based problem-solving enhances health workers' role in health promotion, understanding of social determinants and utilisation of community assets [49]. Solving problems requires clinical skills, critical thinking and empathy. A problem-solving disposition model highlights cognitive stages: reactivating prior knowledge, method selection and implementing strategies. Efficient implementation of the VIA programme requires addressing issues in input, process and environment, particularly materials, actions and community response [74]. When all of these issues have been addressed, it may lead to improved cervical cancer screening coverage.

Solutions to improve the current VIA testing programme might first target the educational and promotional materials used to socialise the programme. Educational facilities and media can be enhanced to increase knowledge and engagement in the VIA test. This includes providing educational videos and audio materials, utilising Televisions/monitors and sound systems in the health centre waiting room, creating social media channels and empowering health cadres to provide information. Collaboration with experts and Obs&Gynae specialist doctor can promote their knowledge and expertise in handling cervical cancer cases. Social media can play a significant role in cancer prevention by delivering relevant health messages [75] and personalised information about HPV awareness [76].

Secondly, collaboration with external parties is crucial for the CHC. Establishing strong partnerships with community agencies, governmental and non-governmental organisations and professionals is essential for comprehensive cervical cancer screening services [72, 77, 78]. Strategies for maintaining strong relationships include developing a community charter, establishing steering committees and implementing effective communication strategies. Involving external individuals and organisations such as village leaders, husbands' communities and non-profit foundations can encourage community participation [72]. Collaborations should be initiated and maintained with midwives, private primary healthcare centers, and Obs&Gynae clinics, working collectively to enhance VIA test coverage. Engaging experts through webinars or talks is also a strategic initiative, specifically to reach younger females, that may emphasize the importance of cervical cancer screening. Ultimately,

strengthening partnerships with governmental and non-governmental organisations across various sectors can secure funding and support for mobile VIA testing initiatives.

Collaborating with third parties, including OB-GYN doctors who are also clinician academicians, proves cost-effective. In our experience, they are willing to provide talks or live sessions on social media for free or at a low fee, benefiting both parties by enhancing community engagement and increasing exposure. Studies confirm that webinars are a cost-effective means to raise awareness and promote resource utilisation for informed decision-making in public health [79]. Furthermore, in Indonesian culture, there is a prevalent practice of showing deferential respect to individuals of higher social status, such as experts and doctors, which can encourage women to undergo cervical cancer screening [80]. Partnering with non-governmental organisations also enhances funding opportunities and cost savings.

Thirdly, reactivating the "VIA Ambassador Cadre" programme is crucial and requires clarifying roles and standard operating procedures (SOPs). Trained cadres are essential in educating and encouraging community members, reducing stigma and increasing awareness for VIA testing. Participatory approaches can enhance cadre interventions in cervical cancer screening, especially in the context of low and middle-income countries (LMICs) [81].

When selecting solutions, cost-effectiveness is crucial. In our case, improving educational resources and media for VIA test awareness proves highly efficient. We only need to allocate more consultation time in our women's health screening clinic, as well as cover expenses for printing banners, producing educational videos, creating podcasts, designing digital posters, preparing mass media campaigns, and providing self-learning materials, all of which could be distributed via social media and WhatsApp groups. This approach is cost-effective, easily reusable and widely distributable. This choice is also supported by a prior systematic review that found among 37 articles with 15,658 female participants in different parts of the world, about one-fourth of the articles were based on health education methods, and different methods (such as mother/daughter education, consultation sessions, videos, educational brochures, broadcast education, tailored counselling and a fact sheet, self-learning package, etc.) are effective in modifying the cervical cancer screening behaviour of women [82, 83].

Finally, reinstating the "VIA Ambassador Cadre" program is also effective. This is because we have previously trained the cadre, and evidence suggests that involving Community Health Workers (CHWs) in LMICs is efficient for spreading awareness of health issues, particularly for diseases like tuberculosis, and potentially in areas such as reproductive, maternal, newborn, and child health [84]. Further research is needed to assess the utilisation of cadres in integrated screening and cancer care. In our experience in a middle-income country, these cadres demonstrated willingness to volunteer at a low cost, making them favorable for addressing health issues in the community.

### Strengths and limitations of the study

This case study evaluates programme effectiveness in urban primary care settings, specifically CHC in Indonesia, which is an area that lacks published research. This study offers a detailed step-by-step approach using the PSC method to address the low achievement of cervical cancer screening targets at a healthcare centre in Jakarta. The PSC method provides guidance to primary care physicians, quality controllers, evaluators and public health practitioners in designing effective solutions. Our study is the first to apply the PSC method to evaluate a programme of cervical cancer screening and visual inspection with the acetic acid method, a previously unexplored topic. Insufficient screening and programme implementation at the primary care level are significant factors in common cervical cancer challenges in developing countries, including Indonesia. This study successfully identifies the root causes of low VIA test coverage and proposes strategic solutions to address these issues.

While this study serves as a valuable reference for evaluating reproductive health programmes, it does have limitations and drawbacks related to the use of secondary data. Secondary data was primarily utilised to assess annual programme and service achievement rates at our centre and identify gaps in target attainment. It is worth noting that this data originates from our community health centre's annual report and is meticulously maintained in our database, compiled with care by healthcare staff to represent collective programme information. On the other hand, we conducted problem identification, root cause analysis and solution-seeking through primary data collection methods, such as observation, interviews and focused group discussions with stakeholders. Another limitation of this study is the absence of a discussion on the implementation and monitoring of recommended solutions. Instead, the study focuses on programme evaluation and root cause analysis. This could potentially serve as a research question for future studies. Additionally, we also acknowledge that this study relies on data from a single centre driven by our initial aim to address health programme issue at our institution. Consequently, further multi-centre research is required to expand the study's scope and provide a more comprehensive perspective on the PSC in a global context.

## Conclusions

The low coverage rate for the VIA test in 2020 was a priority issue in cervical cancer prevention. Factors contributing to this problem include limited access to educational media, challenges in conducting regular educational activities, insufficient counselling on the importance of the VIA test and geographical barriers. Additionally, the community's KAP regarding early detection of cervical cancer is lacking. Using the PSC and fishbone diagrams, this study effectively identified root causes and proposed solutions to increase the VIA test rate. Recommendations include creating educational videos and audio, utilising electronic media platforms, forming online messaging groups through messenger applications (e.g. WhatsApp), strengthening collaboration with health partners and reactivating VIA ambassador cadres. Programme holders and implementers need to conduct follow-up and monitoring evaluations to improve services and benefit the community and health centre.

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## References

1. Chen S, Cao Z, Prettner K, et al. Estimates and Projections of the Global Economic Cost of 29 Cancers in 204 Countries and Territories From 2020 to 2050. *JAMA Oncol* 2023; 9(4): 465–472.
2. Sung H, Ferlay J, Siegel RL, et al. Global Cancer Statistics 2020: GLOBOCAN Estimates of Incidence and Mortality Worldwide for 36 Cancers in 185 Countries. *CA Cancer J Clin* 2021; 71(3): 209–249.

3. Singh D, Vignat J, Lorenzoni V, Global estimates of incidence and mortality of cervical cancer in 2020: a baseline analysis of the WHO Global Cervical Cancer Elimination Initiative. *Lancet Glob Health* 2023; 11(2): e197–e206.
4. Chan CK, Aimagambetova G, Ukybassova T, et al. Human Papillomavirus Infection and Cervical Cancer: Epidemiology, Screening, and Vaccination – Review of Current Perspectives. *J Oncol* 2019; 2019: 3257939, doi: 10.1155/2019/3257939.
5. Sypień P, Zielonka TM. HPV infections, related diseases, and prevention methods. *Fam Med Prim Care Rev* 2022; 24(1): 88–91.
6. Lott BE, Trejo MJ, Baum C, et al. Interventions to increase uptake of cervical screening in sub-Saharan Africa: a scoping review using the integrated behavioral model. *BMC Public Health* 2020; 20(1): 654.
7. Winarto H, Habiburrahman M, Dorothea M, et al. Knowledge, attitudes, and practices among Indonesian urban communities regarding HPV infection, cervical cancer, and HPV vaccination. *PLoS ONE* 2022; 17(5): e0266139.
8. Chua B, Ma V, Asjes C, et al. Barriers to and Facilitators of Cervical Cancer Screening among Women in Southeast Asia: A Systematic Review. *Int J Environ Res Public Health* 2021; 18(9): 4586.
9. Prusaczyk A, Żuk P, Guzek M, et al. An overview of factors influencing cancer screening uptake in primary healthcare institutions. *Fam Med Prim Care Rev* 2022; 24(1): 71–77.
10. Srinath A, Merode F, van, Rao SV, et al. Barriers to cervical cancer and breast cancer screening uptake in low- and middle-income countries: a systematic review. *Health Policy Plan* 2023; 38(4): 509–527.
11. World Health Organization. *WHO guideline for screening and treatment of cervical pre-cancer lesions for cervical cancer prevention*. 2nd ed. Geneva: WHO; 2021.
12. World Health Organization. New recommendations for screening and treatment to prevent cervical cancer. 2021 [cited 15.07.2023]. Available from URL: https://www.who.int/news/item/06-07-2021-new-recommendations-for-screening-and-treatment-to-prevent-cervical-cancer.
13. Huy NVQ, Tam LM, Tram NVQ, et al. The value of visual inspection with acetic acid and Pap smear in cervical cancer screening program in low resource settings – a population-based study. *Gynecol Oncol Rep* 2018; 24: 18–20.
14. Catarino R, Petignat P, Dongui G, et al. Cervical cancer screening in developing countries at a crossroad: Emerging technologies and policy choices. *World J Clin Oncol* 2015; 6(6): 281–290.
15. Nuranna L, Aziz MF, Cornain S, et al. Cervical cancer prevention program in Jakarta, Indonesia: See and Treat model in developing country. *J Gynecol Oncol* 2012; 23(3): 147–152.
16. Utami TW, Nuranna L, Mahathir M, et al. Visual Inspection of Acetic Acid (VIA) as a Promising Standard for Cervical Cancer Screening. *Indones J Soc Obstet Gynecol* 2016; 2(4): 216–219.
17. Nuranna L, Wardany RS, Purwoto G, et al. Agreement Test of Documentation of Visual Inspection with Acetic Acid (DoVIA) and Colposcopy findings as a Screening Tool for Cervical Cancer. *Indones J Soc Obstet Gynecol* 2020; 8(1): 61–65.
18. Purwoto G, Dianika HD, Putra A, et al. Modified Cervicography and Visual Inspection with Acetic Acid as an Alternative Screening Method for Cervical Precancerous Lesions. *J Cancer Prev* 2017; 22(4): 254–259.
19. Kementerian Kesehatan Republik Indonesia. [*Profil Kesehatan Indonesia Tahun 2020*]. Jakarta: Kementerian Kesehatan Republik Indonesia; 2020 (in Indonesian).
20. Badan Pusat Statistik Republik Indonesia. [*Kecamatan Pancoran dalam Angka*]. Jakarta; 2021. Available from URL: https://jakselkota.bps.go.id/publication/download.html?nrbvfeve=NTVhMjc2ZDkwYjRkMzIzZjExY2JmODZj&xzmn=aHR0cHM6Ly9qYWtzZWxrb3RhLmJwcy5nby5pZC9wdWJsaWNhdGlvbi8yMDIxLzA5LzI0LzU1YTI3NmQ5MGI0ZDMyM2YxMWNiZjg2Yy9rZWNhbWF0YW4tcGFuY29yYW4tZGFsYW0tYW5na2EtMjAyMS5od (in Indonesian).
21. Adams J, Neville S. Program Evaluation for Health Professionals: What It Is, What It Isn't and How to Do It. *Int J Qual Methods* 2020; 19: 1609406920964345.
22. Kolkman MJ, Kok M, Veen A, van der. Mental model mapping as a new tool to analyse the use of information in decision-making in integrated water management. *Phys Chem Earth* 2005; 30(4–5): 317–332.
23. Otte-Trojel T, Bont A, de, Aspria M, et al. Developing patient portals in a fragmented healthcare system. *Int J Med Inform* 2015; 84(10): 835–846.
24. Kolfschoten GL, Vreede GJ, de, Briggs RO, et al. Collaboration 'Engineerability'. *Group Decis Negot* 2010; 19(3): 301–321.
25. Tague NR. *The Quality Toolbox*. 2nd ed. Milwaukee: ASQ Quality Press; 2005. Available from URL: https://asq.org/quality-resources/fishbone.
26. American Society for Quality. What is problem solving? [cited 15.06.2023]. Available from URL: https://asq.org/quality-resources/problem-solving.
27. Phillips J, Simmonds L. Using fishbone analysis to investigate problems. *Nurs Times* 2013; 109(15): 18–20.
28. Rantung HB, Darmawansyah D, Asdar M. Analysis of the Planning Process at the Health Center Level at the Poso Regency Health Office. *Int J Papier Pub Rev* 2021; 2(3): 58–68.
29. Ariyanti NS, Adha MA, Sumarsono RB, et al. Strategy to Determine the Priority of Teachers' Quality Problem Using USG (Urgency, Seriousness, Growth) Matrix. *Int Res Educ J* 2020; 2(2): 54–62.
30. Bakri H. The planning of community health center in Indonesia. *Eur J Res Reflect Manag Sci* 2018; 6(3): 12–18.
31. Tan W, Sauser BJ, Ramirez-Marquez JE. Analyzing Component Importance in Multifunction Multicapability Systems Developmental Maturity Assessment. *IEEE Trans Eng Manag* 2011; 58(2): 275–294.
32. Tovar-Perilla NJ, Bermeo-Andrade HP, Torres-Delgado JF, et al. Methodology to support decision-making in prioritization improvement plans aimed at agricultural sector: Case study. *Dyna* (Medellin) 2018; 85(204): 356–363.
33. National Association of County and City Health Officials. Guide to Prioritization Techniques. NACCHO; 2021 [cited 15.06.2023]. Available from URL: https://www.naccho.org/uploads/downloadable-resources/Gudie-to-Prioritization-Techniques.pdf.
34. Respati T, Rathomi HS, eds. [Buku Ajar Ilmu Kesehatan Masyarakat]. Bandung: Pusat Penerbitan Universitas (P2U-LPM) Unisba; 2019 (in Indonesian).
35. The Six Step Problem Solving Model [cited 15.06.2023]. Available from URL: https://www.uapb.edu/sites/www/Uploads/Assessment/webinar/session%203/NewFolder/6%20Step%20Problem%20Solving%20Process.pdf.
36. Bidang Integrasi Pengolahan dan Diseminasi Statistik BPS Provinsi DKI Jakarta. [*DKI Jakarta Province in Figures*]. Jakarta: BPS Provinsi DKI Jakarta; 2021 (in Indonesian).
37. World Health Organization. *Regional Office for South-East Asia. Accelerating the elimination of cervical cancer as a public health problem: Towards achieving 90–70–90 targets by 2030*. Bhutan: WHO Regional Office for South-East Asia; 2022.
38. Bruni L, Serrano B, Roura E, et al. Cervical cancer screening programmes and age-specific coverage estimates for 202 countries and territories worldwide: a review and synthetic analysis. *Lancet Glob Health* 2022; 10(8): e1115–e1127.
39. Kementerian Kesehatan Republik Indonesia. [*PMK No. 29/2017 tentang Perubahan Atas PMK No. 34/2015 tentang Penanggulangan Kanker Payudara dan Kanker Leher Rahim*]. Jakarta; 2017: 1–40. Available from URL: https://peraturan.bpk.go.id/Home/Details/112083/permenkes-no-29-tahun-2017 (in Indonesian).

40. Kementerian Kesehatan Republik Indonesia. [Pedoman Nasional Pelayanan Kesehatan Kanker Serviks]. Jakarta: Kemenkes RI; 2017: 1–59. Available from URL: http://kanker.kemkes.go.id/guidelines/backup/PNPKServiks.pdf (in Indonesian).
41. Robbers GML, Bennett LR, Spagnoletti BRM, et al. Facilitators and barriers for the delivery and uptake of cervical cancer screening in Indonesia: a scoping review. *Glob Health Action* 2021; 14(1): 1979280.
42. Sumarmi S, Hsu YY, Cheng YM, et al. Factors associated with the intention to undergo Pap smear testing in the rural areas of Indonesia: a health belief model. *Reprod Health* 2021; 18(1): 138.
43. Wahidin M, Noviani R, Hermawan S, et al. Population-based cancer registration in Indonesia. *Asian Pac J Cancer Prev* 2012; 13(4): 1709–1710.
44. American Society for Quality. Cause analysis tools: pareto chart. ASQ Quality Press [cited 15.06.2023]. Available from URL: http://www.asq.org/learn-about-quality/cause-analysistools/ overview/pareto.html.
45. Picarillo AP. Introduction to quality improvement tools for the clinician. *J Perinatol* 2018; 38(7): 929–935.
46. Ishikawa K, Loftus JH. *Introduction to quality control.* 3rd ed. Tokyo: 3A Corporation; 1990.
47. Carayon P, Gurses AP. *Nursing Workload and Patient Safety – A Human Factors Engineering Perspective*. In: Hughes RG, ed. *Patient Safety and Quality: An Evidence-Based Handbook for Nurses*. Rockville (MD): Agency for Healthcare Research and Quality (US); 2008.
48. Blamey A, Mackenzie M. Theories of Change and Realistic Evaluation. *Evaluation* 2007; 13(4): 439–455.
49. Donaghy PH, Greenhalgh C, Griffiths J, et al. The use of community problem solving in undergraduate nurse education: a literature review. *Nurse Educ Today* 2022; 116: 105447.
50. Siswanto. Research Implementation Research as Research Methodology to Care for Policy. *Buletin Penelitian Sistem Kesehatan* 2019; 22(2): 137–145.
51. Harel Z, Silver SA, McQuillan RF, et al. How to Diagnose Solutions to a Quality of Care Problem. *Clin J Am Soc Nephrol* 2016; 11(5): 901–907.
52. American Society for Quality. Fishbone diagram. ASQ Quality Press. 2005 [cited 02.03.2011]. Available from URL: http://www.asq.org/learn-about-quality/cause-analysis-tools/overview/fishbone.html.
53. Hisprastin Y, Musfiroh I. Ishikawa Diagram dan Failure Mode Effect Analysis (FMEA) sebagai Metode yang Sering Digunakan dalam Manajemen Risiko Mutu di Industri. *Majalah Farmasetika* 2020; 6(1): 1.
54. Konduri N, Aboagye-Nyame F, Mabirizi D, et al. Digital health technologies to support access to medicines and pharmaceutical services in the achievement of sustainable development goals. *Digit Health* 2018; 4: 205520761877140.
55. Chang H. Evaluation Framework for Telemedicine Using the Logical Framework Approach and a Fishbone Diagram. *Healthc Inform Res* 2015; 21(4): 230–238.
56. Brook OR, Siewert B, Weinstein J, et al. Measuring and improving the patient experience in radiology. *Abdom Radiol* 2017; 42(4): 1259–1267.
57. Balanced Scorecard Institute. Cause and Effect diagram. Basic tools for process improvement [Internet]. Balanced Scorecard Institute; 2007 [cited 16.06.2023]. Available from URL: https://balancedscorecard.org/wp-content/uploads/pdfs/c-ediag.pdf.
58. Knop K, Mielczarek K. Using 5W-1H and 4M Methods to Analyse and Solve the Problem with the Visual Inspection Process – case study. *MATEC Web Conf* 2018; 183: 03006.
59. Bose KT. Application of Fishbone Analysis for Evaluating Supply Chain and Business Process – A Case Study on the ST James Hospital. *Int J Supply Chain Manag* 2012; 3(2): 17–24.
60. Coccia M. Problem-driven innovations in drug discovery: Co-evolution of the patterns of radical innovation with the evolution of problems. *Health Policy Technol* 2016; 5(2): 143–155.
61. Shi L. The Impact of Primary Care: A Focused Review. *Scientifica* (Cairo) 2012; 2012: 432892.
62. Fraser MW, Lombardi BM, Wu S, et al. Integrated Primary Care and Social Work: A Systematic Review. *J Soc Social Work Res* 2018; 9(2): 175–215.
63. Lu AD, Kaul B, Reichert J, et al. Implementation Strategies for Frontline Healthcare Professionals: People, Process Mapping, and Problem Solving. *J Gen Intern Med* 2021; 36(2): 506–510.
64. Bence V. St. *James's Hospital and Lucas Engineering Systems Ltd – A public/private sector collaboration in BPR project B – The reorganisation of purchasing and supplies*. UK: The Cranfied School of Management Working Papers Series; 1995. Available from URL: https://dspace.lib.cranfield.ac.uk/bitstream/handle/1826/2819/SWP%2020-95.PDF?sequence=1&isAllowed=y.
65. Sturges RH, Kilani MI. Towards an integrated design for an assembly evaluation and reasoning system. *Comput Aided Des* 1992; 24(2): 67–79.
66. Castanon A, Rebolj M, Pesola F, et al. COVID-19 disruption to cervical cancer screening in England. *J Med Screen* 2022; 29(3): 203–208.
67. Nonboe MH, Napolitano G, Schroll JB, et al. Impact of COVID-19 pandemic on breast and cervical cancer screening in Denmark: A register-based study. *Elife* 2023; 12: e81605.
68. Patterson T, Palmer K, Robinson WR. Effects of COVID-19 on Cervical Cancer Screening [A74]. *Obstet Gynecol* 2022; 139(1): 22S–22S.
69. Jones D, Neal RD, Duffy SRG, et al. Impact of the COVID-19 pandemic on the symptomatic diagnosis of cancer: the view from primary care. *Lancet Oncol* 2020; 21(6): 748–750.
70. Vose J. Delay in Cancer Screening and Diagnosis During the COVID-19 Pandemic: What Is the Cost? *Oncology* 2020; 34(9): 343.
71. Poli C, Graves J, Sunderland J. Computer-Aided Product Design for Economical Manufacture. *J Manuf Sci Eng* 1988; 1(4): 23–37.
72. Valaitis RK, Carter N, Lam A, et al. Implementation and maintenance of patient navigation programs linking primary care with community-based health and social services: a scoping literature review. *BMC Health Serv Res* 2017; 17(1): 116.
73. World Health Organization. *Comprehensive cervical cancer control. A guide to essential practice*. 2nd ed. Geneva: WHO; 2014.
74. Olivares-Olivares SL, López-Cabrera MV. Self-Assessment of Problem Solving Disposition in Medical Students. *J Biomed Educ* 2014; 2014: 1–6.
75. Zhang J, Le G, Larochelle D, et al. Facts or stories? How to use social media for cervical cancer prevention: a multi-method study of the effects of sender type and content type on increased message sharing. *Prev Med* (Baltim.) 2019; 126: 105751.
76. Lyson HC, Le GM, Zhang J, et al. Social Media as a Tool to Promote Health Awareness: Results from an Online Cervical Cancer Prevention Study. *J Cancer Educ* 2019; 34(4): 819–822.
77. Mullins CD, Shaya FT, Blatt L, et al. A Qualitative Evaluation of a Citywide Community Health Partnership Program. *J Natl Med Assoc* 2012; 104(1–2): 53–60.
78. Spiro A, Oo SA, Marable D, et al. A Unique Model of the Community Health Worker. *Fam Community Health* 2012; 35(2): 147–160.
79. Yost J, Mackintosh J, Read K, et al. Promoting Awareness of Key Resources for Evidence-Informed Decision-making in Public Health: An Evaluation of a Webinar Series about Knowledge Translation Methods and Tools. *Front Public Health* 2016; 4: 72.
80. Fles R, Bos ACRK, Supriyati E, et al. The role of Indonesian patients' health behaviors in delaying the diagnosis of nasopharyngeal carcinoma. *BMC Public Health* 2017; 17(1): 510.

81. O'Donovan J, O'Donovan C, Nagraj S. The role of community health workers in cervical cancer screening in low-income and middle-income countries: a systematic scoping review of the literature. *BMJ Glob Health* 2019; 4(3): e001452.
82. Saei Ghare Naz M, Kariman N, Ebadi A, et al. Educational Interventions for Cervical Cancer Screening Behavior of Women: A Systematic Review. *Asian Pac J Cancer Prev* 2018; 19(4): 875–884.
83. Schliemann D, Su TT, Paramasivam D, et al. Effectiveness of Mass and Small Media Campaigns to Improve Cancer Awareness and Screening Rates in Asia: A Systematic Review. *J Glob Oncol* 2019; 5: 1–20.
84. Vaughan K, Kok MC, Witter S, et al. Costs and cost-effectiveness of community health workers: evidence from a literature review. *Hum Resour Health* 2015; 13: 71.

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Address for correspondence:
Muhammad Habiburrahman, MD
Faculty of Medicine Universitas Indonesia
Dr. Cipto Mangunkusumo Hospital
Jalan Salemba Raya No. 6, Senen, Jakarta Pusat
DKI Jakarta, Indonesia 10430
Tel.: +62 2131930373
E-mail: muhammad.habiburrahman51@ui.ac.id