

## Evaluation of cervical cancer screening program implementation in Boyolali District in 2024

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### Abstract

**Purpose:** The Boyolali district has never reached the cervical cancer screening coverage target for women of childbearing age, aged 30-50 years. In 2023, cervical cancer screening coverage reached 1.7% of the target of 63%. So this study aims to evaluate the implementation of the cervical cancer screening program in Boyolali District in 2024. **Methods:** This study used a descriptive, observational, quantitative design, with analysis using a logic model that included the program implementation components of inputs, activities, and outputs. Sampling was purposive, with 28 respondents selected for their roles in the cervical cancer screening program. Primary data were collected using a questionnaire instrument. All data obtained were then processed and analyzed descriptively using Microsoft Excel. **Results:** The evaluation of the cervical cancer screening program in Boyolali District shows that the input components, particularly regulations and human resources, remain inadequate. In terms of activities, passive and active services, socialization, advocacy, and monitoring and evaluation are still limited. As for cervical cancer screening in Boyolali District in 2024, coverage was only 2.44% of the target, with 6.53% of tests returning positive results. **Conclusion:** The implementation of the cervical cancer screening program in Boyolali District in 2024 was not optimal. Improvement efforts are needed in regulations, resources, and the intensity of activities to increase screening coverage.

**Keywords:** cervical cancer; screening; visual inspection of acetic acid (VIA)

## INTRODUCTION

Cervical cancer is a public health issue that is one of the leading causes of cancer morbidity and mortality among women in low- and middle-income countries, including Indonesia. Cervical cancer is the fourth most common cancer in women worldwide, with 662,301 new cases and 348,874 deaths in 2022, accounting for about 7.5% of all cancer deaths in women [1]. Asia accounts for about 60% of new cases, including Indonesia, which recorded 36,964 new cases and 20,708 deaths [2]. In Central Java, cervical cancer cases increased from 1,545 cases in 2021 to 2,444 cases in

2022. In Boyolali District, a rising trend in cases was also observed from 2020 to 2023.

The high mortality rate is because most cases are detected at an advanced stage. Cervical cancer can be effectively prevented through screening and early detection, but national cervical cancer screening coverage is still far below national and global targets. In 2021-2023, only 14.6% of women of childbearing age underwent Visual Inspection of Acetic Acid (VIA) screening, with coverage in Central Java at 17.6% [3]. In Boyolali, screening achievements are far from the target, with 0.85% in 2021 (30% target), 0.92% in 2022 (43% target), and 1.70% in 2023 (63% target). In 2024, the target is to reach 90% [4].

The Public Health Center (PHC) plays a strategic role in implementing screening, but its success is strongly influenced by service management, resource availability, and policy and network support. Some health centers have seen an increase in achievements, while others have seen a decrease. Previous studies have emphasized the importance of health worker training, service accessibility, and consistent policies to increase screening coverage [5,6].

From a programmatic perspective, evaluation of screening programs is essential to assess whether program inputs, processes, and outputs function as intended. Program evaluation provides evidence on implementation effectiveness, identifies operational gaps, and supports data-driven decision-making for program improvement. However, in Boyolali District, cervical cancer screening coverage has consistently remained low, and to date, no comprehensive evaluation has been conducted to assess how the screening program is implemented. Therefore, this study aims to evaluate the implementation of the cervical cancer screening program in Boyolali District in 2024.

## METHODS

This study used a descriptive observational design and a quantitative approach, analyzing data using a logic-based framework comprising inputs, activities, and outputs. Evaluation using this framework helps identify achievements, understand problems arising in program implementation, and find ways to overcome them [7]. The study was conducted in the working area of the Boyolali District Health Office (DHO), including the DHO and its health centers, from March to May 2025.

The study population consisted of health workers at community health centers (Puskesmas) and the Boyolali District Health Office. Sampling was conducted using purposive sampling, health workers at Puskesmas and the District Health Office who had roles and responsibilities in the cervical cancer screening program. Thus, the sample consisted of 25 cervical cancer programmers at PHCs (one person per PHC), and the health office was represented by one Head of Disease Prevention and Control, one Productive Age Programmer, and one Non-Communicable Disease Programmer.

This study used a logic-based framework, as illustrated in Figure 1, which includes three components in program evaluation: inputs, activities, and outputs. The input component refers to the resources used in the cervical cancer screening program, including the availability of human resources, budget, facilities and infrastructure, regulations, and networks that support its implementation.

The activities component covers all actions carried out in the cervical cancer screening program, planning, active and passive screening services, training, socialization, advocacy, and monitoring and evaluation. The output component is the result of activities in cervical cancer screening, including coverage of cervical cancer screening and coverage of positive VIA. Primary data were collected through 45-minute face-to-face interviews using a closed-ended questionnaire that included questions on respondent identity and agency information, as well as questions related to each component of the logic model. Secondary data were obtained from manual reports (Excel), the ASIK application (Aplikasi Sehat IndonesiaKu), Budget Implementation Documents, and program implementation documents, including regulations, SOPs, and terms of reference.



Figure 1. Conceptual framework for the program evaluation sub-study with a logic-based framework by CDC

The collected data was entered into Microsoft Excel for further analysis. Quantitative data analysis was performed descriptively to describe the variables consisting of inputs, activities, and outputs. Each input variable and activity had a score calculated from the average percentage of each indicator in that variable. The percentages are interpreted based on Bloom's Cut Off Point classification as follows: values <60% are categorized as 'Not Good'; values 61%–79% are classified as 'Fairly Good'; and values >80% are categorized as 'Good'. Meanwhile, the output is based on calculations of the percentage of women who have undergone cervical cancer screening relative to the target estimate for 2024, and the rate of positive IVA results relative to the number of IVA tests in 2024.

This study has obtained a research ethics letter issued by the Research Ethics Committee of the Faculty of Medicine, Public Health, and Nursing, Gadjah Mada University, with the number KE-FK-0140-EC-2025. In addition, it also obtained a research certificate/permit from Gadjah Mada University and the Boyolali District Health Office. The researchers obtained informed consent from the respondents and received their approval to participate in the study.

## RESULTS

Based on Table 1, the total number of respondents was 28 people who were dominated by 100% women with the highest age group of 26 - 45 years 60.71%, the most recent education was D3 64.29%, the most length of work in the cervical cancer screening program was ≤ 5 years 85.71%, the most profession was midwife 92.86%, and respondents who had concurrent duties ≥ than three as much as 53.57%.

**Table 1. Respondent characteristics (n=28)**

Respondent characteristics		n	%
<b>Gender</b>	Male	0	0.00
	Female	28	100.00
<b>Age (years)</b>	26 – 45	17	60.71
	>45	11	39.29
<b>Education</b>	High School	0	0.00
	D3	18	64.29
	S1/Profession	10	35.71
<b>Length of work in the program (years)</b>	≤ 5	24	85.71
	> 5	4	14.29
<b>Profession</b>	Midwife	26	92.86
	Public health	2	7.14
<b>Duplicate duties</b>	< than 3	13	46.43
	≥ than 3	15	53.57

### Inputs

#### Human resources

At the Boyolali District Health Office, cervical cancer screening is handled by two divisions: the Disease

Prevention and Control Division and the Public Health Division. The Disease Prevention and Control Division involves the Non-Communicable Disease Programmer and the Head of the Disease Prevention and Control Section. Meanwhile, from the Public Health Division, it is handled by the Productive Age Programmer.

Cervical cancer screening services using the Visual Inspection with Acetic Acid (VIA) method are available at all PHCs in Boyolali District (100%). However, they are not yet available at other health facilities, such as clinics and doctors' private practices. PHC in Boyolali District has 18 doctors and 42 midwives who have received training to conduct VIA examinations.

In accordance with Permenkes No. 29/2017, each health service facility is expected to have at least two midwives and one trained general practitioner. However, the data shows that only 5 out of 25 health centers (20%) have met this requirement. However, most health centers have at least one trained health worker who can perform cervical cancer screening independently.

#### Facilities and infrastructure

All PHCs (100%) have a closed room for VIA examination and Medical Consumables, including speculums, lamps, 3-5% acetic acid solution, cotton sticks, gloves, and chlorine or enzymatic solutions. However, only 92% of PHCs have Communication, Information, and Education media, including posters, leaflets, banners, videos, social media, or flip sheets. Meanwhile, the Health Office only has BMHP available for distribution to VIA screening service providers. Based on interviews with the Health Office, because the Health Office does not have IEC media available, the PHC must procure its own.

#### Budget

Based on document review and interviews, it is known that in 2024, the Boyolali District Health Office obtained the cervical cancer screening program budget from the State Budget, which was used to provide Medical Consumables, conduct training, and support meeting activities. All PHCs (100%) reported that program funding also came from the Health Operational Assistance, mainly for communication, information, and education activities, socialization, and official travel. One PHC received additional funding from the Solidarity of Women for Humanity and Human Rights (Yayasan Solidaritas Perempuan untuk Kemanusiaan dan Hak Asasi Manusia / SPEK HAM) organization to support consumption during community outreach activities. Most respondents (82.14%) considered the available funds sufficient, while 17.86% stated the budget remained inadequate. Additional

budget is needed primarily for training activities, community socialization, and the implementation of screening services.

### **Regulation**

All respondents (100%) stated that the implementation of cervical cancer screening still refers to the national regulations set by the Ministry of Health, including: (1) BPJS Health Regulation No. 3/2024 on health screening services, (2) Minister of Health Regulation No. 29/2017 on breast cancer and cervical cancer prevention, and (3) Decree of the Indonesian Minister of Health No. HK.01.07/MENKES/2090/2023 on technical guidelines for the implementation of health screening. However, there is no specific local regulation, such as a Regional Action Plan or a Circular Letter from the Provincial or District Health Office, that governs the implementation of cervical cancer screening. Of the 25 health centers, three (12%) do not yet have Standard Operating Procedures and still refer to the MOH technical guidelines or training materials they have received. Respondents suggested several needs for regulatory strengthening, including: increased socialization of regulations to health workers and related networks, strengthening cross-sectoral cooperation, technical direction from the Health Office for service integration (for example, with family planning or STIs), and issuance of Circular Letters related to the implementation of cervical cancer screening and fulfillment of reproductive health rights through socialization activities.

### **Networking**

Networks involved in implementing cervical cancer screening at PHCs include various parties. All PHCs (100%) collaborate with health cadres to support screening activities. Some additional networks that play a role include the NGO SPEK-HAM at PHC Ngemplak, cryotherapy referral PHC (Musuk, Boyolali I, Sawit, Ngemplak, Nogosari, and Andong), and community organizations such as Family Empowerment and Welfare at the village and sub-district levels. A total of 64.28% of PHCs have held network meetings to support screening implementation, and 28.57% hold meetings more than twice a year. These network meetings discuss important topics, such as early detection of cervical cancer, socialization and education, planning active screening activities in the working area, and updating information on screening service policies.

## **Activities**

### **Planning**

All respondents from PHC (100%) stated that the targeting of the cervical cancer screening program is based on data from the District Health Office, sourced from the projected number of women of childbearing age aged 30-50 years. All PHCs also developed budget plans that included socialization activities, active services, and Information, Education, and Communication (IEC) media. At the district level, the screening program planning is divided into two sectors. The Disease Prevention and Control Division, which handles the procurement of Medical Consumables and reporting through the ASIK application. Furthermore, the Public Health Division is responsible for manual reporting as well as training and socialization. Although most respondents did not experience any obstacles, two respondents (7.14%) reported planning obstacles, the lack of valid data for target estimation, and an unclear division of tasks between the Public Health and Disease Prevention and Control sectors at the Health Office.

### **Passive services**

All PHCs in the Boyolali district have implemented cervical cancer screening using the Visual Inspection with Acetic Acid (VIA) method. Most respondents (96.43%) understood the flow of screening services depicted. The target of this service is women of childbearing age, aged 30-50 years, especially those who come independently or have complaints. In addition, screening is also integrated with family planning (92.86%) and sexually transmitted infection (21.43%) services. The service procedure started with initial counseling on cervical cancer screening (92.86%) and risk factor screening (96.43%). Before the examination, the patient was asked to sign a consent form for medical action (96.43%). If the VIA result is positive (VIA+), further treatment will be provided as cryotherapy at the PHC or referred to a facility that offers such services (100%). 60.72% of respondents stated that there is a reminder for women who have undergone screening to return three years later, usually in the form of a written notification. However, there is no reminder system for women who have not been screened. Screening services are conducted at the discretion of each PHC, with the majority (64%) only opening services one day per week. Although Permenkes No. 29/2017 recommends a service frequency of 2-3 times per week, only 28% of PHCs have implemented it.

### **Active services**

Only 3 of 25 PHCs (12%) in Boyolali District actively conducted cervical cancer screening at Village Health Posts or auxiliary PHCs. In 2024, one PHC carried out 12 activities and the other two carried out three activities each, screening 170 women of childbearing age. Among 17 respondents (60.71%), the main obstacles were limited health workers and low community participation.

### **Training**

All respondents (100%) stated that in 2024, the Boyolali District Health Office organized one cervical cancer screening training in collaboration with the Health Training Center of Central Java Province, using the Special Allocation Fund Non-Physical budget. The training was attended by 21 midwives and nine doctors and lasted 9 days. The training materials included program policies, strengthening early detection achievements, knowledge about cervical cancer, VIA test procedures, follow-up of pre-cancerous lesions (such as cryotherapy), infection prevention, health promotion and counseling, and recording and reporting of early detection results.

### **Socialization**

In 2024, the Boyolali District Health Office conducted one socialization session for providers on cervical cancer screening and reporting systems. However, there were no direct socialization activities aimed at the community. At the PHC level, 21 out of 25 PHCs have conducted socialization at varying frequencies, while 4 PHCs have not. Three PHCs are the most active, with up to 24 socialization events per year. The primary targets of socialization include health cadres, community organizations such as the Family Empowerment and Welfare, and women of childbearing age.

The materials presented included the importance of screening (84%), the VIA method (84%), risk factors (80%), and cervical cancer prevention efforts (76%). A total of 35.71% of respondents reported obstacles to the implementation of socialization, including limited workforce and time, suboptimal implementation when combined with toddler activities, and the perception that the socialization budget is under the health promotion section rather than allocated explicitly to the cervical cancer screening program.

### **Advocacy**

In 2024, the Boyolali District Health Office did not conduct advocacy activities related to the cervical cancer screening program. However, 12 out of 25 PHCs (48%) have conducted advocacy with various targets, including sub-district and village officials (20%),

community organizations such as Family Empowerment and Welfare and Dharma Wanita (24%), community leaders (20%), cross-sectors (12%), and family planning centers (4%).

The frequency of advocacy activities ranges from 1 to 4 times a year. From these advocacy activities, 36% of respondents reported successfully obtaining commitments from relevant parties to increase public awareness of the importance of cervical cancer screening. In addition, 16% of health centers received support in the form of additional health workers or cadres. However, three respondents (10.71%) reported barriers, including an unclear division of tasks between Public Health and Disease Prevention and Control at the Health Office, and poorly structured advocacy application procedures.

### **Monitoring and evaluation**

In 2024, the Boyolali District Health Office did not conduct monitoring and evaluation activities on the implementation of the cervical cancer screening program. All PHCs (100%) stated that they had never received a monitoring or evaluation visit from the office. Based on interviews, the main obstacle in implementing this activity is the limited human resources and time available at the office level.

### **Output**

#### **Cervical cancer screening coverage**

During the period 2022-2024 in Boyolali District, 3,752 women aged 30-50 years, or 2.44% of the total target, have undergone cervical cancer screening using the Visual Inspection of Acetic Acid (VIA) method.

#### **Coverage of positive VIA screening results**

During the period 2022 to 2024 in Boyolali District, of 3,752 women of reproductive age who underwent cervical cancer screening using the Acetic Acid Visual Inspection (VIA) method, 245 (6.53%) had positive VIA screening results (VIA+).

## **DISCUSSION**

All respondents in the program evaluation and surveillance sub-study were female, mostly aged 26–45 years, with a D3 Midwifery education (60.71% and 64.29%). Most had  $\leq 5$  years of experience in the screening program (85.71%) and  $\geq$  three concurrent duties (53.57%), which may limit their focus and effectiveness in VIA screening [7].

### **Overview**

Cervical cancer screening coverage is still very low, at only 2.44% of the total target over the last three

years, far below the national target of 90%. This achievement indicates that promotive and preventive efforts have not been optimized and that service coverage for women of childbearing age is limited. Low coverage can lead to late case detection, so the majority are only found at advanced stages, which risks increasing morbidity and mortality [8]. On the other hand, the positive VIA result of 6.53% indicates that the VIA screening method is effective in detecting precancerous lesions in the participants examined.

### **Program strengths**

Aspects of the budget, infrastructure, and networking showed good structural support. The implementation of planning and training was also optimal. Most health system financing in developing countries comes from government budgets, rather than private insurance or out-of-pocket funds. Government budgets are an essential starting point for ensuring that health programs serve the community [9]. At the district health office level, funds are available through the state budget. Meanwhile, at the PHC level, activity funds are provided by the state budget through the Health Operational Assistance and Non-Governmental Organization (NGO) SPEK-HAM mechanisms, which are managed directly by each PHC. Most respondents stated that the available funds were sufficient to support the implementation of cervical cancer screening programs. However, there were still limitations in implementing active activities and socialization. All PHCs have an examination room and logistics for VIA services.

92% have IEC media, an essential component for increasing women's awareness and motivation to participate in screening [10,11]. Network support from cadres, NGOs (such as SPEK HAM), and community organizations (such as Family Empowerment and Welfare) strengthened collaboration in program implementation [12,13]. Community engagement has proven effective in increasing coverage and participation [14]. Setting targets based on population data from the Population Office, as well as planning activities carried out by two fields in the Health Office, shows a coordinated effort in program management [15]. Training in collaboration between the Boyolali Health Office and the Health Training Center has been shown to increase the number of trained human resources and improve technical skills, which are essential for achieving more comprehensive coverage [16].

### **Program weaknesses**

The cervical cancer screening program in Boyolali District in 2024, in terms of input components, shows that regulatory aspects and human resources need

strengthening to enhance the program's effectiveness. In terms of activities, socialization activities, advocacy, passive services, active services, and monitoring and evaluation, they still need to be improved to support the effectiveness of the cervical cancer screening program in Boyolali District. There is no local policy (such as a Circular Letter or RAD), and 3 out of 25 PHCs lack screening SOPs, limiting implementation to the central technical guidelines, even though local regulations can improve program integration and strengthen stakeholder support [17]. The availability of trained personnel has not met the standard (Permenkes No. 29/2017), which requires a minimum of two midwives and one trained doctor. This is in line with the findings of Apriningrum et al. (2017), who found that limited human resources are the main obstacle to the implementation of screening in primary care [7].

Socialization from the Health Office is limited to providers, while 52% of PHCs conduct socialization only 1-6 times/year, and 16% do not conduct it at all. The lack of socialization contributes to low awareness among women of childbearing age [18,19]. A community approach is needed, involving cadres and community leaders, and integrating into routine activities such as Posyandu or family planning [20,21]. The Health Office has not carried out advocacy, and it is carried out by only half of the PHC, even though advocacy is essential for policy support and cross-sector commitment [17].

The lack of clarity in the division of tasks between the Public Health and Disease Prevention and Control sectors also hampers the effectiveness of advocacy. Passive services are available at all PHCs, but have not been integrated with family planning or STI services. Integration of these services is essential to improve access and program effectiveness [22]. Reminders are only given to existing participants, while women of childbearing age who have never been screened remain unattained, even though reminders have been proven effective in increasing participation [23].

The frequency of VIA services is still low; the majority of PHCs only open once per week, which is not in accordance with Permenkes, which recommends 2-3 times/week. This limits the community's access to services. Only 12% of PHCs provide active services, so the ball-pickup approach is not optimal [8]. The most significant weakness is in monitoring and evaluation, as the Health Office did not conduct it with the PHC in 2024. The absence of monitoring and evaluation risks inconsistencies in reporting, weak follow-up, and unidentified program constraints [8,17].

This study has several limitations. First, the study design is descriptive and evaluative, so it cannot explain the causal relationship between program compo-

nents and screening outcomes. Second, data collection primarily relied on interviews and document review, which may have introduced information bias. Third, this study was conducted in one district, so the results cannot be generalized to other regions with different characteristics. Nevertheless, this study still provides an essential contextual overview of the implementation of cervical cancer screening programs at the district level. Future studies are recommended to use analytical or mixed-methods designs and involve multiple districts better to assess the relationship between program components and screening outcomes and to improve generalizability. In addition, it incorporates data from various sources within target populations and stakeholders.

## CONCLUSION

The evaluation of cervical cancer screening implementation in Boyolali District shows that, in the input component, weaknesses lie in regulations and the availability of human resources. At the same time, strengths are in budget support, facilities and infrastructure, and networking. In the activities component, weaknesses include the low intensity of passive and active services and limited socialization, advocacy, and monitoring and evaluation activities. At the same time, strengths lie in the planning and training that have been carried out. In the output component, the coverage of cervical cancer screening using the VIA method in Boyolali District reached only 2.44% of the total target, and 6.53% of those screened tested positive VIA, indicating suspected cervical precancerous lesions that require further assessment or follow-up.

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