RESEARCH ARTICLE

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Indonesian Midwives' Readiness to Upscale the Secondary Prevention of Cervical Cancer within Primary Health Clinics: A Qualitative Study of Midwives Across Three Provinces

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Abstract

Objective: This article analyzes the readiness of Indonesian midwives for the rapid scale-up of secondary prevention of cervical cancer, in line with Indonesia's National Plan for Cervical Cancer Elimination (2023–2030). **Methods:** Data were collected via a mixed-methods study conducted in 2024. We analyzed a subset of qualitative data from semi-structured interviews with 24 midwives, sampled from 13 primary health clinics (PHCs) in Kupang City, Purworejo Regency, and Palu City. Thematic analysis revealed four key themes relevant to determining midwives' readiness: knowledge; technical training and confidence in performing visual inspection with acetic acid (VIA); communication skills; and motivation. **Result:** Midwives' knowledge of causation and risk factors was high, underpinning their high perception of cervical cancer risk and subsequent strong motivation to provide screening. However, inconsistent knowledge existed regarding screening targets, intervals, and clinical indications for screening. Training coverage was low, with only half of the midwives having received training. Multiple midwives viewed their training as inadequate for establishing competency in the interpretation of VIA results, negatively impacting their motivation. Midwives reported high confidence in communication skills but noted a lack of health communication materials for patient education and raised concerns over the suitability of PHC information systems for enabling follow-up. **Conclusion:** The proportion of Indonesian midwives receiving training in cervical screening and provider-administered HPV DNA testing needs to increase significantly. Training in cervical cancer prevention should receive greater attention in the core curriculum for midwifery accreditation. The content should be more comprehensive, addressing knowledge gaps, low confidence in interpreting VIA results, and the transition to HPV DNA testing. A train-the-trainer program for senior midwives to enable high-quality peer education would be a strategic investment. Critical system-level changes such as adequate budgets, provision of health communication materials, and improvements to the design and use of health information systems are also required.

Keywords: human resources- primary care- pre-cancer- human papillomavirus- visual inspection with acetic acid

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Introduction

In December 2023 Indonesia launched its National Cervical Cancer Elimination Plan - 2023 to 2030, signaling its commitment to reducing the country's current high incidence and mortality rates and its participation in the Global strategy for accelerating the elimination of cervical cancer as a public health problem [1, 2]. In line with the Global strategy, Indonesia's national plan incorporates primary prevention and secondary prevention and appropriate treatment and management of invasive. The targets set by Indonesia across these pillars are more inclusive and ambitious than those set by the World Health Organization. They include achieving the following by the year 2030: 1) 90% of both girls and boys receiving human papilloma virus (HPV) vaccination by age 15, 2) 75% of women between the ages of 30 and 69 screened with a HPV DNA test, and 3) 90% of women identified with cervical pre-cancer and cancer lesions receiving treatment.

These targets will require the rapid upscale of access to and uptake of HPV vaccination and cervical screening, and a rapid transition from cervical screening via visual

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inspection by acetic acid (VIA) to HPV DNA testing. Vaccination will be provided free of cost primarily through the National Immunization Program relying on school-based immunization, which has had impressive results to date. Research on HPV vaccination acceptance in pilot sites indicates around 90% acceptance rates and confirms the safety of the Gardasil vaccine in Indonesia [3-5]. However, secondary prevention efforts are lagging due to a variety of reasons, with recent estimates of the proportion of Indonesian women of reproductive age who have ever undertaken cervical screening being between 12% in 2020 and 8.8% in 2023 [6, 7]. Reasons behind low screening rates include demand side factors such as: low risk perception in relation to cervical cancer; lack of knowledge of the need for screening or confidence in the accuracy of screening; fear, fatalism and embarrassment among eligible women; time, transportation and financial constraints; and lack of husband or family support for women undergoing screening [8-12].

Supply side factors impeding access and uptake of screening have been far less researched than demand side factors, leaving a significant gap in evidence regarding how the health system can be strengthened to support secondary prevention. The limited research on supply side barriers has identified a lack of skilled screening providers, lack of advocacy and health promotion skills among providers, resource constraints including budgetary and facility level gaps, and lack of supervision, and support for providers to implement screening programs [12]. Our findings extend the understanding of supply side capacity through the specific lens of Indonesian midwives seeking to provide screening at the primary care level.

Here we report on the first research that has specifically aimed to understand 'readiness' for the rapid up-scale of secondary prevention of cervical cancer in Indonesia, by mapping readiness at the primary level. We contend that readiness of health services to provide secondary prevention requires three central interconnected components. These include infrastructure and facilities, workforce competency, and availability of medical supplies and equipment, as well as understanding and supporting the readiness of communities to take up services. This article focuses on workforce competency as a predictor of readiness within PHC. We discuss four core areas of health worker competency identified as crucial by Indonesian midwives: knowledge, training and technical competency, communication skills, and motivation.

Clinically trained midwives working in the public sector are the key personnel charged with providing cervical cancer screening at PHC, and traditional midwives are not involved with the provision of VIA in Indonesia. While Indonesia's current program seeks to provide a screen-and-treat model, where women with a positive VIA result can access timely free-of-charge cryotherapy, two factors prevented the collection of sufficient data on cryotherapy. Firstly, only one PHC out of 13 data points had functioning cryotherapy equipment. Secondly, the provision of cryotherapy is not designated to midwives and can only be provided by doctors under the current legal framework. As midwives working in PHC are the backbone of Indonesia's secondary prevention program it is crucial to understand their competency in the provision of VIA, which has direct implications for their readiness for upscaling secondary prevention and the planned transition to using provider-administered HPV DNA testing by 2030.

Materials and Methods

The data presented in this article is derived from interviews with Indonesian midwives (n=24) employed in PHC across three provinces and 13 districts in Indonesia. Data were collected between July and December 2024 via a mixed-method study evaluating the readiness of Indonesian health services at the primary level for rapid scale-up of both primary and secondary prevention of cervical cancer. The larger study collected quantitative data from PHC through administration of questionnaires and observational assessments. Qualitative data was collected using semi-structured interviews with health workers. Due to space constraints this article reports specifically on data collected via in-depth interviews with midwives. The midwives who participated represented 13 different PHCs across Purworejo Regency (n=10), Palu City (n=7), and Kupang City (n=7), representing populations from three provinces and communities that are urban and peri-urban in Kupang, rural in Purworejo and coastal in Palu.

All midwife participants were employed in PHC with the highest level of government accreditation, referred as paripurna (complete services). At the time of research 67% of all PHC in Indonesia had paripurna status, meaning that they had achieved an accreditation score of at least 80% or higher [7]. The provision of VIA falls within the current remit of prevention of non-communicable diseases. Purposive selection of paripurna PHC aimed to provide comparable results based on consistent level of service accreditation.

Interviews were conducted face-to-face by a team of three researchers, taking between 30 to 60 minutes. Informed voluntary consent was negotiated and no PHC personnel approached declined to participate. Interviews were conducted in Indonesian, recorded with participants' permission and transcribed verbatim. Transcripts were double-checked by two team members and uploaded into Dedoose for thematic analysis. A coding frame was developed as a team, using deductive themes from the interview guide, and inductive sub-themes that emerged during data collection and processing. Ethical approval was given by the Medical and Health Research Ethics Committee (MHREC) Faculty of Medicine, Public Health and Nursing of Universitas Gadjah Mada, approval number KE/FK/0183/EC/2024. Written approvals to invite health workers to participate were gained from District Health Offices (DHO) and heads of specific PHC, and no names or identifying characteristics have been used when quoting midwives.

Results

Four key areas were most relevant in determining midwives' readiness across all provinces. These were:

a) midwives' knowledge, b) training experiences and technical confidence, c) communication skills, and d) midwives' motivation. We discuss each theme in turn but note that themes were often intertwined in midwives' narratives. For instance, midwives' motivation could be linked with their confidence in their technical skills, which in turn could be linked with their level of training or knowledge.

Midwives' knowledge

Key knowledge themes included: VIA program targets, clinical indications for screening, recommended frequency of screening, and follow-up protocols. Knowledge of national program targets was inconsistent, reflecting progressive changes in policy and program targets, without updates being adequately communicated at the service level. For instance, some midwives included all women of reproductive age in their definition of the target group, as opposed to the most recent target group of women between the ages of 30 and 69 years [6].

There was also conflation of the concepts of clinical indications for screening versus target populations. However, as a group midwives tended towards more inclusive understandings of who should be offered screening, based on their understanding that HPV is a sexually transmissible infection (STI). For example, one midwife clarified: "The point is, she qualifies if she has had sexual intercourse, right? No matter the age, what matters is that she has already had sexual contact." Similarly, another midwife from a different region explained: "In terms of the target, it's more focused on WUS [women of reproductive age]. That's it."

Clinical indications for screening were commonly interpreted as including symptoms of other STIs or reproductive tract infections, such as unusual discharge or itchiness, mentioned by 14 midwives. There appeared to be a lack of clarity concerning the fact that HPV and precancer cells are both asymptomatic, and a tendency to treat any vaginal symptoms as an indication of the need for VIA. However, this interpretation was consistent with earlier guidelines on VIA within a Ministerial Decree in 2010 [1], again suggesting that policy updates were not being communicated to the service level.

Midwives' knowledge of recommended screening frequency (as per national guidelines) was surprisingly low, with only five midwives articulating the time frames of five years for women who test negative and three years for women with inconclusive results or who are considered as higher risk. Nearly half of all midwives (n=11) recommended that women undertake screening on an annual basis, with another eight stating that they had no clear understanding of the recommended screening interval. Inconsistent knowledge of recommended screening frequency informed midwives' knowledge of follow-up protocols, with many midwives suggesting follow-up in the form of annual repeat screening.

Midwives' knowledge and practices concerning follow-up for women with positive VIA results was varied, reflecting inconsistent availability of service options in different districts. The follow-up options reported included: 1) referral for cryotherapy in locations where it was available mentioned by ten midwives, 2) referral for a Pap smear in either the public or private system reported by nine midwives, and 3) referral to an obstetrician-gynecologist in cases where invasive cancer was suspected mentioned by 16 midwives. Midwives emphasized that both the availability of services and the preferences of patients determined how they handled referrals. For instance, one midwife explained: "As for referrals, it depends on where the patient wants to go. Sometimes, as long as there's an obstetrician-gynecologist, we provide the referral."

Another issue impacting referral and follow-up was the degree to which PHC health information systems were operational, being used by midwives, and were limited by design. Two system limitations hindered follow-up. Firstly, positive VIA results are required to be entered into the national health insurance database (BPJS), which in theory allows PHC staff to trace referral of women to public hospitals. However, this system has limited utility because information can only be viewed by the PHC that entered the initial screening result, the system has no capacity to trace women who receive referrals but do not present to the hospital they were referred to, or women who present to another PHC. Moreover, in some cases BPJS data from PHC is not linked with or accessed by private hospitals or privately practicing specialists, meaning women who move between the public and private health systems can be lost to follow-up. Midwives also noted the limitations of PHC information gathering protocols for enabling follow-up, mentioned by nine midwives and explained as follows:

[The PHC] submits a monthly report to the District Health Office on the results of VIA screening. The report includes the total number of women screened and their screening outcomes, using a standardized form…However, this report only reflects the total number of screenings, not individual data.

Despite the challenges posed for follow-up, due to information system limitations, eight midwives explained how they improvised at the community level to reach out to women with positive or abnormal results, providing continuity of care via social media platforms such as WhatsApp or home visits, as described below:

If we refer them to the hospital… usually we just follow-up directly with the patient. Normally, the area supervisor [village midwife] would ask something like, "Ma'am, how did it go? What's the follow-up?", something like that.

Technical training and confidence in performing VIA

Findings regarding midwives' experiences of and needs for technical training on VIA raised several key issues including the quantity and quality of training, gaps in midwives' technical confidence, and practices of peer training. Twelve out of 24 midwives had undertaken the VIA training offered and none had received training on administering HPV DNA tests at the time data were collected. Slightly different rates of training were reported across the three regencies (see Table 1). However, this is difficult to interpret as the sample size was small. Midwives attributed variation in rates of training between

Table 1. Total Number of Midwives who had Ever Received VIA Training (n out of 24) and Total Number of Midwives who Ever Received Training per Regency

District	Midwives who have been trained		Total
	Yes	No	
Purworejo	4	6	10
Kupang	4	3	7
Palu	4	3	7
Total	12	12	24

regencies to perceived differences in prioritization and funding stemming from Provincial Health Offices (PHO), and differences in leadership at the PHC level. While half of the midwives had participated in initial VIA training, only five had received more than one VIA related training opportunity. The time frame over which midwives reported undertaking training was from 2010 through to 2024. Despite the availability of training, overall training quotas still fell below what is required to successfully implement the VIA screening program in line with national goals.

Midwives shared several concerns regarding the quality and comprehensiveness of training. The most common concern was the limited depth of training on interpretation of VIA results. Two midwives from separate regencies described their lack of confidence in interpreting results as follows: "We already can do the others [vaginal speculum exam], but I don't know how to read it [VIA test results]" and "Actually, the main obstacle for me is to accurately read the VIA result". Midwives also described how VIA-related training is delivered in modules that are not always delivered sequentially, with the vaginal speculum examination and application of acetic acid being the focus of one module, and visual inspection and interpretation covered in a separate module. Midwives felt that the training would be more effective if these skills were practiced in an integrated format, with extended opportunities for practicing visual inspection and interpretation.

An additional concern raised was the need for up-to-date training that integrated policy updates, and advances in knowledge and technology. The demand for updated training was well expressed by a midwife who was a VIA program coordinator:

There should be more training sessions for VIA personnel. That way, staff competence can improve. Knowledge keeps evolving every year. So, someone who attended training, say, five years ago, might not have learned the same things. There could be updates in knowledge maybe in counselling techniques, for instance… there's always something to improve.

Four senior midwives and district level leaders of VIA programs were offering peer training to midwife colleagues, yet no midwives reported obtaining train-the-trainer (TOT) qualifications in this area. A more junior midwife described her peer learning opportunities in the following way:

...we sit together to be taught… it's just like when you sit around waiting for patients, the manager friend tells what the examination will be, how to do it. Later, when the patient comes, they will be accompanied… then they will be taught like so.

The peer approach to improving technical competence and prioritizing VIA at PHC level was considered an important supportive factor promoting midwives' competency and confidence. However, the quality of peer training could only be assured if the midwives providing peer training had been trained as trainers themselves.

Communication skills

The importance of being a skilled communicator for the successful provision of screening services was asserted by 13 out of 24 midwives. Providing adequate knowledge for women to be able to make an informed choice, as well as communicating in a manner that allayed women's anxieties about the physical examination, were understood as crucial aspects of communication between midwives and patients. The following quote demonstrates how an experienced midwife reassured women and explained the procedure using accessible lay language:

Yes, that's how we say it… "This examination does not involve any surgeries, or stitches, etc. We gently open it [the vagina and cervix], then we examine it only by applying liquid. Clear liquid to visualize what you have got inside there"... What matters is using everyday language to encourage them [to screen].

Midwives reported on the content of information provided to patients, as well as the information retrieved from patients. Information provided encompassed general knowledge about HPV and cervical cancer and why screening is important, including the benefits of early detection for cancer prevention. A commonly used phrase shared by five midwives, derived from government policy was "satu kali dibuka" (opening the vagina once), referring to the opportunity to provide screening concurrently when women are already undergoing a vaginal examination for other services, such the insertion or removal of inter uterine devices (IUDs) or during prenatal checkups. This phrase was intended to encourage women to take advantage of concurrent services, with 19 out of 24 midwives reporting using this strategy, most often concurrently with family planning services. Additional information provided included verbal communication of VIA results and referral letters if test results were positive or suspected positive. However, several midwives were concerned over a lack of access to health communication materials. Midwives specifically felt the use of flip charts was highly beneficial for visually demonstrating the VIA procedure, what positive and negative VIA results looked like, and to describe the progression of cervical cancer and why it needed to be detected early. One midwife described the difficulties of providing quality patient education without visual aids as follows:

Actually, that is our shortcoming here [in the PHC], we don't have flipcharts. So, when we need to educate patients, we have to search [the Internet], but images appear too small to show [to patients] on this phone. Some time ago, we requested health communication materials, but perhaps their availability is limited, and that's why we have none.

Information typically retrieved from patients prior to screening included the patient's age, type of family planning being used (if using a modern method), the length of their current marriage (for married women), and if they have previously screened for cervical cancer. For women who had previously screened midwives enquired about when the last screening had occurred. However, midwives reported that it was uncommon for this information to be entered into the PHC health information system, meaning that the information could not be used to inform repeat screening or follow-up. Two midwives described issues with the reporting system as follows: "But for reporting, the RM [Rekam Medik/medical records] or results have not been collected by us. It's just, not been collected regularly," and "[we ask] because all this time it's none, no report, no examination. That is why I pursued them [colleagues at the Provincial Health Office]".

Motivation to provide VIA

A range of factors were reported as supporting a high level of motivation to offer VIA services and these were present across all sites. The most common intrinsic motivation was personal pride in performing the allocated tasks of a midwife and a sense that they wanted to adequately fulfill the full range of designated tasks within their roles. Closely related were feelings of satisfaction among midwives derived from a sense of making a meaningful contribution to the health of the communities they live in. This was well expressed by a midwife who was a VIA program coordinator:

I'm happy if what I do is useful for others. Even if I don't receive explicit thanks… at least if I know that they are okay now [after being screened], I am satisfied by this.

Other forms of intrinsic motivation included the desire to build clinical competence in as many areas of midwifery as possible, as well as the influence of personal experiences. These personal experiences included midwives knowing someone with a cervical cancer diagnosis and having personally experienced another form of reproductive cancer.

Midwives also discussed other forms of relationally driven motivation such as feelings of closeness to the community, and confidence that this familiarity facilitated women taking up screening. One midwife explained the significance of midwives' relationship with communities in the following way:

Usually, the women want to be screened. As it happens, the midwives in this clinic many of them live here. So, they can be more... What to say? Closer [to women]. Also, they can easily persuade them.

Midwives' confidence in communicating with patients, and in the technical aspects of interpreting results impacted on their intrinsic motivation. Motivation was lower among midwives without high confidence in their technical and communication skills. Relational dynamics also limited extrinsic motivation for midwives working as a sole-service providers, which constrained their capacity to integrate VIA. Two midwives identified institutional factors that prevented them from providing VIA, for one this was due to her lower position in a hierarchical decision-making structure, and another midwife felt her excessive workload prevented her from adding VIA on top of other services.

Lack of financial resources was commonly a form of extrinsic de-motivation both in terms of the need for resources to run screening programs within clinics and via outreach. Seventeen out of 24 midwives mentioned a lack of adequate reimbursement for providing VIA outside of clinic hours, including compensation for hygiene supplies, transport, petrol, and other out-of-pocket costs. Concern over the unstable flow of program funds from PHO was expressed in all three provinces, and a clear difference in motivation was reported between times when program funds were sufficient and insufficient, as one respondent described:

In the past (laugh), if there was money, it was like "quick let's do VIA…" Then we would conduct VIA tests for everyone. Now that there is no money for it, people feel reluctant to be the PIC [person in charge of the program]. So, they gave it [the role] to me.

Several respondents also explained that the active involvement of the PHO in initiating mass screening, inviting women to screening, and providing clinic budgets for screening all impacted on the ability of midwives to prioritize VIA. Midwives from each province suggested that it would be more effective if VIA screening was better integrated with the wider non-communicable disease prevention program. A midwife program coordinator expressed this concern:

Even though the NCD team have been told, if you are going to the community [for outreach] they should include the VIA staff to help. To help them to do screening. But during all this time, I have never been called. So, I just do what I can do [provide VIA alone].

Despite financial limitations and lack of program integration, multiple midwives continued to provide outreach screening to remote and rural communities by splitting the allocated budget for one person between them. This underscores how peer support and mutual reliance on colleagues acted to motivate midwives who were in a position where they could partially finance the services they were offering.

Discussion

Correct knowledge that HPV is an STI, that all sexually active women (and men) are at risk of contracting HPV, and that cervical cancer is a staged disease requiring early detection, was high among midwives in this study, and appeared to underpin their strong intrinsic motivation to provide screening. However, the notable inconsistency in understandings of screening targets, clinical indications for screening, recommended screening intervals, and follow-up protocols all require correction. These knowledge gaps can be addressed through updated training, as well as regular communication of evolving screening protocols, technologies, and targets. Improved regularity of communication about policy impacts on service provision will be crucial to effectively manage the transition in screening and testing modality that midwives must adapt to in coming months and years. Inconsistency in follow-up knowledge and practices among midwives

also needs to be considered in relation to system level weaknesses that include unequal access to cryotherapy between provinces and PHCs within the same province, meaning that referral options are highly variable and thus strict follow-up protocols that promote a screen-and-treat approach at the same facility are not relevant in many locations.

Our findings on gaps in midwives' training confirms prior observations that the number of trained providers in PHC in Indonesia is insufficient to provide the level of screening required to meet the target of 75% of women between the ages of 30 and 69 being screened by 2030 [12]. The imperative of substantially increasing the proportion of midwives being trained to confidently provide services is equally relevant for screening with VIA and HPV DNA testing. A key training weakness was the extent to which current training leaves midwives lacking confidence in interpreting VIA results. While this training component needs improvement, it will eventually become less of a concern when the transition to HPV DNA testing occurs, because HPV DNA tests are not reliant on direct provider observation. We suggest that more comprehensive training on cervical cancer prevention should be integrated into the initial medical education curriculum for midwife accreditation, rather than only being offered as modular add-on training after graduation. Organic peer training activities led by senior midwives in PHC suggest that strong collegiality is a valuable asset in the PHC context. Consequently, we suggest that developing train-the-trainer modules to support senior midwives to officially qualify as trainers in screening methods would be a wise investment, considering the current shortage of trained staff, and the impending need for midwives to retrain in provider-administered HPV DNA testing.

Communicating with clients about the need for and process of cervical screening was noted as an important skill by most midwives in this study. The closeness between midwives and the communities they serve was understood as an advantage that facilitated successful communication. However, many midwives identified a lack of appropriate communication tools such as flip charts, that they knew would enhance the ease of communication about the screening process and the developmental trajectory of cervical cancer. We suggest that addressing this resource constraint, by developing and distributing updated communications tools, is a low-cost but high-reward strategy that will improve midwives' ability to educate and support women to take up screening. While many midwives discussed the information they collected from clients prior to screening, and record-keeping on the number of women screened, they revealed a concerning gap in how information was being recorded. In instances where only the number of women screened was recorded, the opportunity for timely repeat screening (in three to five years) was lost. Moreover, the limitations of the health information system in some PHC meant that no additional information could be added as women who tested positive moved through the health system to secondary or tertiary levels. As a result, many midwives relied on informal communication channels to check on the progress of women who had tested positive, without any access to integrated or continuous patient files. For cervical screening to reach its greatest potential in detecting and treating precancer a significantly improved communication and information system is required, and midwives will need the requisite training to utilize the system to its fullest.

Midwives in this study reported high levels of intrinsic motivation to provide screening, that was primarily driven by their accurate risk perception related to cervical cancer and the desire to save lives, as well as a sense of professional pride. Despite this motivation, several system level constraints impacted midwives' confidence in their ability to provide quality screening services. As discussed above, inadequate training constrained some midwives' confidence in interpreting VIA results, which understandably led to reluctance to perform VIA. A lack of confidence in interpreting VIA results has also been identified as affecting intrinsic motivation to offer VIA to patients in other middle-income country contexts [13]. At the facility level, midwives' motivation was negatively influenced in contexts where a limited number of staff combined with high workloads resulted in their inability to integrate yet another service, when they were already struggling to provide routine services. The dilemmas of low staffing and high workloads at the primary care level in low- and middle-income countries, were also identified by a recent systematic review of cervical cancer screening programs, which found these system level factors to inhibit provider motivation [14]. Lack of budgetary allocations for screening programs both within PHC and through outreach activities also inhibited the motivation and capacity of some midwives to provide screening, which is an issue that needs to be addressed at the system level.

The purposive sample of midwives across three varied provinces included in this study, while adequate for an exploratory study seeking to highlight key issues of concern, was not extensive enough to capture variability across all of Indonesia's 38 provinces. Thus, our findings cannot be treated as nationally representative, and larger studies are required to generate a detailed evidence-base to inform improvements in medical education, on-the-job training, and health system changes required to support midwives to provide screening at the primary health level. Additionally, as we only included midwives and PHC in the public health system, the provision of cervical screening and HPV-DNA testing in the private sector also needs to be investigated.

In summary, this study has provided essential insights into workforce readiness related to the secondary prevention of cervical cancer in Indonesia. It is clear that in many aspects Indonesian midwives are both highly competent and strongly motivated to provide screening, despite very significant deficits in the supports they need to do their jobs to full effect. The continued contributions of midwives will be absolutely pivotal to the success of upscaling the coverage of secondary prevention in Indonesia and facilitating the transition to the more accurate technology of HPV DNA testing. Strategies to enhance the readiness of midwives for upscaling prevention will require substantial investments in midwives as health professionals, as well as significantly

increased investments in the allocated budgets, facility infrastructure and resources required to deliver cervical screening and HPV DNA testing and subsequent treatment for women with positive results.

Author Contribution Statement

Conceptualization and design of the study - SAW, LRB, RKH, M, AS, RSH; collection of primary data – RSH, M, RKH, AS; data analysis and interpretation - RSH, RKH, IGAPEP, SOF, LRB, SAW; manuscript writing and critical review LRB, SAW, RSH, RKH, IGAPEP, SOF. All authors have read and approved the final manuscript version.

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Ethical Declaration

Ethics approval for the study was granted by the Health Research Ethics Committee (MHREC) Faculty of Medicine, Public Health and Nursing of Universitas Gadjah Mada, approval number KE/FK/0183/EC/2024. Approval to invite study participants to participate in the research were also provided by the relevant Provincial Health Offices in the three provinces, and the PHC Managers of each PHC included in the study.

Conflict of Interest

No conflict of interest exists for any authors of this article.

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