

Mapping the Disconnect: A Evaluation of Cervical Cancer Care Pathways in the Private Sector in Kenya: A Mixed Methods Study.

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Mapping the Disconnect: A Evaluation of Cervical Cancer Care Pathways in the Private Sector in Kenya: A Mixed Methods Study.

Short title: Cervical Cancer Care Pathways in Kenya's Private Sector

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Author's contributions

SM conceptualized the idea, and wrote the first draft. JG, MK participated in the interpretation of results and manuscript review for substantial intellectual content. SM, JG, BL, CM, and MK reviewed the manuscript. All the authors read and approved the manuscript for publication.

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Competing Interests

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Mapping the Disconnect: A Evaluation of Cervical Cancer Care Pathways in the Private Sector in Kenya: A Mixed Methods Study.

Abstract

Introduction: Despite advances in HPV vaccination and screening technologies, the uptake of these preventive measures remains low in Kenya, particularly within private healthcare settings. This study evaluates the health facility readiness in integration of routine HPV testing into cervical cancer screening programs in private facilities across Kenya, providing evidence to inform scalable interventions aligned with the 90-70-90 global targets for cervical cancer elimination.

Methods: A convergent parallel mixed-methods design was employed to investigate barriers, facilitators, and contextual factors influencing HPV testing in 30 private healthcare facilities across 15 counties in Kenya. Quantitative data were retrospectively extracted from facility records. Qualitative data from 19 key informant interviews with healthcare providers were thematically analyzed.

Results: The study found that only 9% of facilities provided HPV DNA testing, with the majority relying on visual inspection with acetic acid (VIA) as the primary screening method. Financial constraints and inadequate infrastructure emerged as significant barriers, compounded by training gaps, fragmented referral pathways, and lengthy turnaround times for test results. However, self-sampling and community health promoter outreach were identified as key facilitators for increasing participation. Facilities with trained personnel and robust community engagement reported higher screening rates.

Discussion: Public-private partnerships and innovative funding mechanisms could play a pivotal role in overcoming cost barriers and improving service delivery. Addressing systemic barriers, fostering public-private collaborations, and leveraging community-based interventions are pivotal in bridging gaps in service delivery and improving health outcomes

for women. This study provides actionable insights to guide national policy and programmatic strategies for sustainable and equitable cervical cancer prevention.

Teaser Key Message: Kenya can eliminate cervical cancer by integrating advanced HPV DNA testing and self-sampling into private facilities. Overcoming financial barriers through public-private partnerships, scaling capacity building, and leveraging community health promoters will ensure equitable, systemic access for all underserved women.

Key Findings

- There is a significant diagnostic gap in Kenya's private health sector, showing only 9% of the health facilities provide high-precision HPV-DNA testing. Majority of private providers rely heavily on Visual Inspection with Acetic Acid as the primary screening tool.
- Granular barriers in the cervical cancer care pathways include fragmented referral pathways, inadequate infrastructure, staff training gaps and lengthy test turnaround time. Grassroots facilitators acting as structural drivers of screening include HPV self-sampling and organized community health promoters.
- The key policy implications entail the subsidizing of cost of HPV-DNA molecular testing kits through strategic public-private funding models, formalization and integration of self-sampling screening kits in routine care, prioritization of rapid-turnaround lab workflows, and intensified staff training to mend fragmented internal referral loops.

Introduction

Cervical cancer is a global health challenge, ranking as the fourth most common cancer in women, with an annual incidence of 660,000 cases and 350,000 deaths worldwide [1]. Tragically, 94% of these deaths occur in low- and middle-income countries (LMICs), reflecting significant disparities in access to preventive and curative healthcare services. In Kenya, cervical cancer is the leading cause of cancer-related mortality among women, with approximately 5,236 new cases and 3,211 deaths reported annually [2]. This burden is exacerbated by systemic gaps in healthcare access, socio-economic inequalities, and inadequate awareness of preventive interventions.

The primary cause of cervical cancer is persistent infection with high-risk human papillomavirus (HPV) types, particularly HPV-16 and HPV-18, which together account for 95% of cases. These infections are sexually transmitted and can progress to invasive cancer over 10–20 years if untreated [3]. Most sexually active individuals are infected with HPV at some point in their lives, often asymptotically, but persistent exposure to high-risk types potentiates the development of abnormal cells that can evolve into cancer [4]. Among HIV-positive women, the prevalence of high-risk HPV types is particularly elevated, further compounding the cervical cancer burden in LMICs.

In high-income countries, advances in vaccination programs and screening strategies, such as HPV DNA testing, have significantly reduced cervical cancer incidence and mortality [5]. However, in LMICs, progress has been slower due to financial constraints, limited healthcare infrastructure, and socio-cultural barriers. For instance, a systematic review found that the uptake of cervical cancer screening in sub-Saharan Africa remains as low as 12.12%, reflecting considerable heterogeneity across settings [6]. Barriers include inaccessibility of screening services, lack of awareness, and financial and cultural constraints [7]. Women in sub-Saharan Africa also face increased HPV risk from societal factors such as polygamy, early marriages, and high parity [8,9].

The World Health Organization has established the 90-70-90 targets to eliminate cervical cancer as a public health problem: 90% of girls vaccinated by age 15, 70% of women screened by age 35 and again by 45, and 90% of women diagnosed with cervical disease receiving appropriate treatment [10]. In Kenya, achieving these targets is hindered by reliance on visual inspection with acetic acid (VIA) as the primary screening method, despite its lower sensitivity and specificity compared to HPV DNA testing [11]. Financial barriers further constrain access to HPV testing, which is available in only 9% of private healthcare facilities, making comprehensive screening inaccessible for most women.

Private healthcare facilities, accounting for a significant proportion of service delivery in Kenya, offer an underutilized opportunity to scale cervical cancer screening. This study evaluates the integration of routine HPV testing in private facilities across 15 counties, employing a mixed-methods approach to identify systemic barriers, facilitators, and contextual factors influencing screening uptake. By generating contextual evidence, the study aims to inform policies and interventions that address the inequitable burden of cervical cancer among women in Kenya and similar LMIC settings. Our findings provide actionable insights into leveraging public-private partnerships, optimizing resources, and advancing Kenya's progress toward cervical cancer elimination.

Methods

We employed a cross-sectional convergent parallel mixed methods design to collect baseline data on barriers and facilitators of HPV testing and cervical cancer screening in 15 counties in Kenya. The study employed the Consolidated Framework for Implementation Research (CFIR) to guide the evaluation of the context of implementation of HPV testing. We then employed the Framework for Reporting Adaptations and Modifications to Evidence-based Implementation Strategies (FRAME-IS) [12] to document and report the modifications on

HPV testing strategies that were proposed to ensure successful integration into routine service delivery. Modifications are crucial to implementation success to fit the local population, settings, and contexts. The research integrated quantitative and qualitative methodologies to provide a nuanced understanding of service delivery and uptake challenges. The study was approved by Mount Kenya University Institutional Scientific Ethics Committee (#2374) and FIND (ID WH004). The study methods were performed in accordance with the CFIR framework and reporting guided by the FRAME-IS framework and ethical consideration as outlined in the ethical clearance letter.

Description of study sites

Each of the counties has a higher number of women in its population and combined, represents 39% of women in Kenya [13]. The diversity in the population demographic in the 15 counties provided a rich mix of contextual vulnerabilities, facilitators and barriers affecting cervical cancer screening service delivery to women. This provided a representative sample of women across various regions in Kenya. This expanse of evidence includes accessibility and sociocultural barriers, community knowledge gap and health seeking behavior and health systems factors affecting service delivery and availability to women. Two facilities were selected in each of the 15 counties.

Data collection

We used a structured retrospective data abstraction of all cervical cancer screening tests conducted per facility. An interviewer-guided questionnaire was administered to facility health providers to determine the current cervical cancer screening/testing and treatment practices in each facility. Qualitative data collection encompassed 19 key informant interviews to understand the perceptions and experiences regarding the barriers, facilitators and other determinants of cervical care seeking, and acceptability of cervical cancer screening with a keen focus on HPV DNA Self sampling screening.

Results

Healthcare service delivery in Kenya is structured in a hierarchical manner with the current structure consists of 6 levels. Majority of the facilities (56%) in our sample frame were level 4 facilities according to the Kenya Essential Package for Health and 41% were level 3B. These facilities are primarily medium-sized private hospitals that are primary referral centers and offer services that compliment primary health care services allowing for delivery of more comprehensive care. The primary cervical screening strategy provided in 68% of the facilities was visual inspection with acetic acid. This is echoed by health providers in the qualitative narrations:

“So the most common cervical cancer screening modality is Via (Visual Inspection with Acetic acid), mostly because of cost. Yeah. And also mostly because of access of the materials that are needed to do the test.” KII Tree of Life Doctor

A closer look at the level 3 facilities however revealed that only 46% of these comprehensive care centers offered at least one method of cervical screening indicating a significant gap in availability of screening services to women. The Kenya National Cervical cancer screening guidelines recommend HPV testing as the primary screening method for women 30 years and above [14]. However, our study showed that HPV testing was only available in 3 of the 32 sampled facilities primarily due to the current high cost of screening making it unaffordable to most women, lack of resources and various health system challenges (figure 1). The providers provided further insights into this as alluded by this narrative:

“I think it's (HPV testing) accurate. Very specific. The challenge with it is the cost. Cost and the accessibility, And availability,. So it limits the uptake and so many people cannot afford it.” KII Cottolengo Clinician

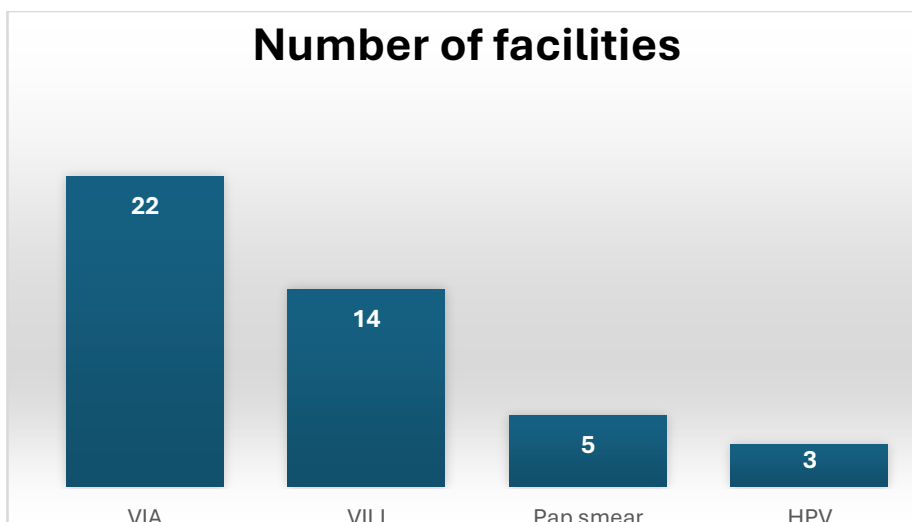


Figure 1: Availability of cervical cancer screening services

We retrospectively evaluated the average duration the health facilities had been providing any method of cervical screening to gain an understanding of cervical cancer screening availability over the years in the private health sector. The findings indicated an average of 3.5 years of availability of cervical cancer screening across all facilities that offered the services. This is suggestive of relatively limited integration of cervical cancer screening in routine service delivery in private health facilities. The quantitative data indicated there was only one health provider providing screening in 59% of facilities whose service delivery points included screening indicative of low prioritization in the health service delivery. However, qualitative data offered a deeper understanding structured cervical screening triage processes:

“Yeah, we take our HPV services at MCH. And, for the outpatient department, we also cover them. From that other part, the triage. We take their names there. Then we tend to get to the clients.” **KII St. Orsola Clinician**

We assessed the respondents’ articulation of cervical cancer screening recommendations on frequency of screening. 76.4% indicated individual risk factors as the primary criteria for screening and not the recommended screening interval of 5 years among HIV negative women

and 3 years for those who are HIV positive. This provides an opportunity for training to bridge the gap in knowledge and align health providers to cervical cancer screening guidelines. The primary source of information for women was primarily one-on-one counselling (80%) followed by posters (50%) and brochures (25%). In contrast, qualitative insights mentioned community health promoters, churches, community outreach programs and radio broadcasts as the primary information sources for sensitization and demand creation;

“at the community level, we can, we can get the information from CHPs (community health promoters.” KII Cottolengo CCC Nurse

“: Radio. Most people use radio in this into this community. Yeah. So radio, television.” KII Maxicare Nurse in charge

“We do offer outreach programs. So there's that constant involvement with the community. So, yes, we do give them pia information” KII Mariakani Nurse

Some facilities also mentioned weak community health systems which are a vital pillar in health service delivery in Kenya.

“We don't have a community unit attached here. KII Yala Facility in charge Nurse

We noted health systems gaps in training on cervical cancer screening with the current training being ad hoc. 45% of respondents in the 22 facilities with cervical cancer screening strategies available had had some training or continuous education in screening.

Cervical cancer referral pathways

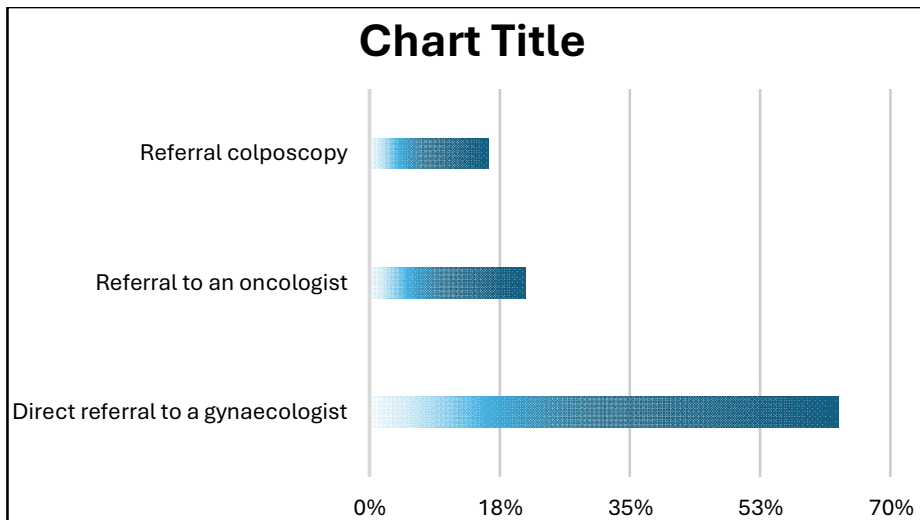


Figure 2: Cervical cancer referral pathway

The primary referral pathway in most facilities was direct referral to a gynecologist as indicated in the figure 2 above. The qualitative interviews reinforced this with this mention below;

“At many a times, there’s always women who come for gynecology checkup. Then our gynae does a request. The gynae refers them for referral, and a few cases the request is by a physician.” KII Nightingale Nurse

Women faced financial challenges in meeting the costs of the referral processes worsened by the fact that the cost was not met by the social health insurance. The turnaround time on testing from sample collection to results is lengthy resulting in delays in the treatment and referral of women.

“So you get a client taking too long, so you end up referring them, because she needs the service, yet she cannot get it. And if you give a span of 2 weeks, you tell them to look for money 2 weeks, of course, like it requires you give another option.” KII Mariakani Nurse

in charge

“So you find out that when we have the sample, we take the sample there. The turnaround time takes more than two weeks.” KII Cottolengo CCC Nurse

Challenges in cervical cancer screening

The providers highlighted several challenges to cervical cancer screening with 4 emerging as significant challenges as indicated in figure 3. Financial constraints led with 33% followed closely by lack of patient awareness at 30%.

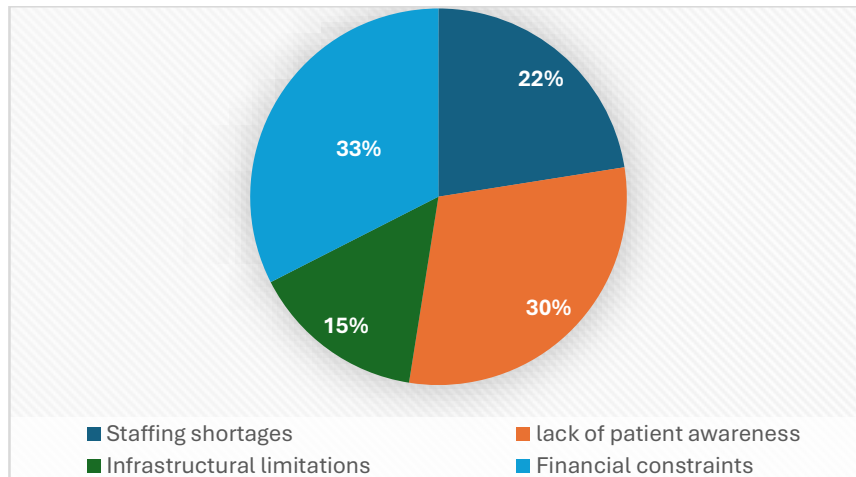


Figure 3: Challenges in cervical cancer screening

Consequently, from the qualitative data, the findings indicate congruency in the patient-side barriers identified. Cost of health services was seen as a major hinderance to cervical cancer screening.

*“.....if you look at a great a great percentage of our population is unable to pay for health care services. **KII Westside Facility in charge***

There was an association of cervical cancer screening with cancer indicative of a knowledge gap in the community which presents as a critical barrier to care seeking for cervical cancer services.

*“Because they don't want to be diagnosed. They believe if you know you have a cancer, you die early. **KII St. Orsola clinician***

Discussion

This study underscores the systemic and contextual factors in integrating HPV testing into routine cervical cancer screening in private healthcare facilities in Kenya. The reliance on VIA as the primary screening method reflects a broader trend in LMICs, where cost and infrastructural constraints limit access to high-precision diagnostics like HPV DNA testing. Similar findings were reported in Tanzania, where VIA accounted for 75% of screening methods due to its cost-effectiveness [15].

Globally, the adoption of HPV DNA testing has demonstrated significant improvements in screening accuracy and early detection. A study in India by Sankaranarayanan et al. [16] found that HPV DNA testing reduced cervical cancer mortality by 50% compared to VIA. However, the high cost of HPV tests remains a significant barrier in LMICs. In Kenya, as in other sub-Saharan African countries, the cost of HPV testing—averaging \$25 per test—exceeds the financial capacity of most patients, highlighting the urgent need for subsidized services and innovative funding models.

Our findings align with studies from Rwanda, where the introduction of self-sampling kits increased screening uptake by 30% among previously unscreened women [17]. Self-sampling emerged as a critical enabler in our study, particularly in addressing socio-cultural barriers. Leveraging this strategy in Kenya could significantly expand access, especially in underserved rural areas.

The lack of awareness and cultural stigma identified in this study mirrors findings from Uganda, where fear of a cancer diagnosis and misconceptions about screening procedures deterred women from seeking care [18]. Addressing these barriers requires targeted community advocacy and education campaigns that engage men and religious leaders as champions for cervical cancer prevention.

Training gaps and weak referral systems emerged as critical bottlenecks in service delivery. Similar challenges were reported in Nigeria, where only 40% of facilities had personnel

trained in cervical cancer screening [19]. A structured training program aligned with national guidelines is essential to build capacity and improve service quality.

The integration of HPV testing into private healthcare settings presents a significant opportunity to scale cervical cancer screening in Kenya. Public-private partnerships, such as those implemented in Ghana, have demonstrated success in mobilizing resources and expanding access to diagnostic services [20]. In Kenya, fostering such collaborations could reduce costs, enhance infrastructure, and support the local production of HPV test kits.

Achieving Kenya's 90:70:90 targets requires a multi-pronged approach that addresses financial, systemic, and cultural barriers. Policy interventions should prioritize subsidies for HPV testing, standardized training for healthcare providers, and the integration of self-sampling into national screening programs. Strengthening referral pathways and reducing turnaround times for test results are also critical to improving patient outcomes.

Conclusion

Cervical cancer remains a significant public health challenge in Kenya, disproportionately affecting women in low-resource settings where access to preventive and curative healthcare is limited. This study underscores the critical gaps in cervical cancer screening, particularly the underutilization of high-precision diagnostic methods such as HPV DNA testing in private healthcare facilities. The reliance on less sensitive methods like visual inspection with acetic acid (VIA), compounded by financial, infrastructural, and socio-cultural barriers, perpetuates inequities in cervical cancer prevention and care.

Despite these challenges, the study identifies actionable opportunities for transformative change. Self-sampling and community-driven awareness campaigns emerge as promising strategies to overcome stigma and enhance screening uptake. Facilities with robust provider training and community health promoter engagement demonstrate significantly higher participation, underscoring the importance of capacity building and grassroots involvement.

Additionally, public-private partnerships present a viable avenue for resource mobilization, subsidizing the costs of HPV testing, and scaling service delivery.

Achieving Kenya's 90-70-90 cervical cancer elimination targets will require a multi-pronged approach: strengthening health systems through targeted investments in infrastructure and human resources, integrating innovative technologies like self-sampling into routine care, and fostering cross-sector collaborations to expand service reach. Policymakers must prioritize equity by addressing the financial barriers that disproportionately affect women in underserved communities, ensuring that the benefits of advanced screening technologies are accessible to all.

This study provides a roadmap for integrating HPV testing into Kenya's private healthcare sector, offering insights that can be adapted to similar low- and middle-income countries. By addressing systemic gaps, leveraging community engagement, and fostering sustainable partnerships, Kenya has the potential to significantly reduce the burden of cervical cancer and achieve its vision of eliminating this preventable disease as a public health threat.

Ethics Statement

Ethical approval was secured from Mount Kenya University (MKU) under protocol #2374, and FIND study ID WH004. Written informed consent was obtained from each participant before conducting an interview. Identifying details were not included during data collection, data entry or analysis.

Data Availability Statement

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

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