

# Determinants of an integrated cervical cancer screening services in primary healthcare: sharing lessons from Kisumu, Kenya

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## Abstract

**Background.** The successful integration of cervical cancer screening service (CCASS) into primary healthcare's routine services depends on locality-specific and context-based service determinants.

**Objective.** This paper aims to identify the abovementioned determinants and discusses how health administrators can manage their influence on CCASS delivery at the primary healthcare level.

**Methods.** We conducted in-depth face-to-face interviews using a structured questionnaire with CCASS nurse providers and managers in four randomly selected primary health facilities. Information on the method(s) of screening utilised, the challenges faced, and the changes observed in CCASS provision were collected. Service managers were asked how they managed unplanned CCASS disruption, factors influencing CCASS replication, and aftercare support to cancer-affected women. Nurse providers were interviewed on the management of CCASS awareness and critical

changes required to sustain CCASS service effectiveness. We used a constant interactive and inductive approach for data analysis.

**Results.** Nine thematic categories of CCASS determinants were identified: 'cultural', 'socioeconomic', 'individual', 'health system', 'evidence-based operations', 'outcome-based resourcing', 'workflow improvement and standardisation', 'inclusive partner's management', 'utilisation'. These determinants were grouped into three domains: 'conceptual', 'outcomes', and 'growth' domains, to correspond to clusters of determinants that are likely to influence the CCASS lifecycle in its formative, continuous delivery or productivity, and reproductive phases.

**Conclusions.** The findings show that sustaining an efficient integrated CCASS delivery at the PHC level requires phase-appropriate continuous adaptive improvements of service determinants within that locality.

## Introduction

Integrating cervical cancer screening service (CCASS) into primary healthcare as a strategy to reduce mortality related to cervical cancer is still advocated, particularly in low-to-middle-income countries (LMIC).<sup>1-3</sup> Evidence shows that variations in outputs and outcomes of different CCASS are due to service determinants unique to the setting where the program is implemented.<sup>4-6</sup> In this context, service determinants refer to factors that influence the outcomes of CCASS at different periods and phases of its maturity. These factors may act independently or in synergy with other variables on the operational processes or performance to influence the impact of CCASS.<sup>4-6</sup>

A wide range of cervical cancer screening determinants has been established, including socioeconomic, individual, literacy, health infrastructure, stakeholders buy-in, and administrative skills.<sup>4-6</sup> Existing literature mainly reports on these determinants based on finding from opportunistic cervical cancer screening programs, which are short-lived and verticalised.<sup>4,7</sup> Whereby the intent is to seemingly devolve and sustain CCASS delivery, similar to family planning (FP), immunisation, antenatal care or postnatal or HIV/AIDS services. It is unclear how these reported determinants of CCASS interrelate or their effect change over time. Furthermore, published studies need to concisely state the phase of the program's life cycle in which the evaluation occurred or link the determinants to each phase.<sup>8</sup> Phasing the CCASS life cycle or maturity and accurately appraising determinants of each phase can offer an alternate approach to CCASS managers, policymakers or health administrators to allocate resources and sustain the benefit CCASS deliver to their local population.

Kisumu County in Kenya has operated an organised and institutionalised CCASS effort at their PHC level for more than seven years. It is against a backdrop of national indicators of approximately 5,250 new cervical cancer cases, 3,286 deaths from cervical

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cancer and a crude incidence rate per 10,000 per year of 20.5.<sup>9</sup> The PHCs adopted an integrated approach to CCASS by offering as a composite service cervical cancer screening, HIV/AIDS care and support, family planning (FP) services, and youth and adolescent care and support services.<sup>5</sup> This composite service aims to increase coverage and utilisation of CCASS by women at higher-than-average risk of developing cervical cancer, such as women living with the human immunodeficiency virus (HIV), sexually active women, and women receiving any form of family planning. The CCASS in Kisumu is nurse-led, comprising of the following: counselling and client education, Human Papilloma Virus (HPV) testing and biopsy for Papanicolaou Smear (a donor-funded component), visual inspection using acetic acid or Lugol's iodine (VIA/VILLI) supplemented by handheld portable colposcopy device (the Mobile ODT device), cryotherapy treatment (day clinic – same visit 'see-and-treat'), referral of women with a suspicious(cancerous) lesion to the regional teaching (tertiary) hospital and clinical audit.

The stability of gains, including 'recruitment' or 'participation' or 'early detection rate of precancerous lesion', sustained over a long period, is the primary intent in organised CCASS<sup>10</sup> like in Kisumu. However, these gains are associated with the maturity or program lifecycle.<sup>10</sup> Health programs progress through typical phases in their life cycle. Scheirer and Schwandt identify these phases as program planning and development,<sup>8</sup> testing causal effectiveness (in the case of pilot programs), the continuous program delivery phase, and the replication (or dissemination) phases. It is still unclear what determinants predominate a phase of CCASS in resource-constrained primary healthcare settings.

Therefore, this study aims to assess the enablers and barriers to organised and integrated CCASS delivery at the primary healthcare level. Identifying and linking these determinants to the several phases of a service operation's life cycle will guide health administrators and program managers in developing, improving, delivering, and scaling up organised cervical cancer screening services. Understanding these determinants is crucial to developing an informed plan for transitioning to organised in-service screenings and for appraising the performance of a cervical cancer screening service.

## Materials and methods

A simple convenience sampling technique was used to recruit nine nurse managers and nurse providers for the study. All participants were leaders in CCASS delivery. Informed consent was sought prior to participation in the in-depth interview (IDI). Including nurse providers and the CCASS managers enabled an all-round understanding of the barriers and enablers to CCASS delivery; however, each respondent's data was considered independent, as suggested by Beitin.<sup>11</sup>

Each participant was interviewed using a validated structured questionnaire with open-ended questions and probed to obtain information related to the screening method(s) utilised, the challenges faced in CCASS service provision, the change observed in the profile and the number of women receiving CCASS. Service managers were asked about unplanned CCASS disruption, factors influencing CCASS service operations and replication, support to patients with positive findings, including their referrals, and if a service audit was in place. The nurse providers were asked about the change in the primary mode of awareness based on their client's feedback.

A trained research assistant administered the questionnaire and took notes whilst the other research assistants made audio recordings of each respondent. Both research assistants generated verba-

tim transcripts using a validated transcription protocol to standardise transcription according to standards suggested by Lapadat and Lindsay.<sup>12</sup> There was a progressive review of respondent feedback. The research assistants discontinued the interviews after no new thoughts or ideas emerged due to the data saturation.<sup>13</sup>

The verbatim transcripts were carefully examined and coded using a constant iterative, inductive approach.<sup>12</sup> Thematic analysis was performed. The research assistants coded the variables based on how it affects service operation as a subtheme category. Secondly, using principles of performance management and program evaluation, the research assistants, by identifying what elements make a specific variable or how it evokes its effect, clustered the variables into themes or service determinant(s). Each determinant was a sum of specific variables; thus, the term 'category' of determinants was used to signify the pluralism of variables summed into one determinant.

Furthermore, by adopting a lifecycle, performance management and evaluation approach, we phased CCASS delivery into the formative, productivity, and reproductive phases of its maturity, akin to the approach by Scheirer and Schwandt.<sup>8</sup> Also, using the same approach, we grouped determinants likely to be preponderant to a phase of CCASS delivery as a domain. Two additional research team members independently analysed the responses before agreeing on the codes, subthemes, themes and domains.

We matched each domain to a phase of the CCASS. Besides, this phased approach equips CCASS administrators with an alternative way to appraise and improve CCASS operations in their locality through tailored variable control and monitoring mechanisms. A non-hierarchical framework was developed to illustrate the contribution of determinants to achieving the optimal operation of the screening service.<sup>14</sup>

## Ethical approval

The Local institutional review board approved the study: approval number ERC.IB/Vol.1/583

## Results

The analysis revealed that CCASS delivery was simultaneously affected by specific variables. These variables exist and act together in a distinct category as a determinant, and a cluster of determinants is preponderant to a phase of CCASS maturity. The variables include cultural practices that disempower women to act despite increased CCASS awareness, poverty, managing the local supply chain, and continuous learning and development in practice. Others are adaptive referral management, inclusive health insurance targeting poor women, and integration of collaborators and sponsors. In addition, outcome-focus financing and CCASS utilisation emerged as primary variables influencing CCASS delivery in Kisumu. Depending on how managers control the influence of these variables, any variable (Table 1 and Supplementary Table S1) affected CCASS as barriers, enablers, or confound CCASS outcomes. The variables act simultaneously to determine CCASS outputs, participant profile utilising CCASS, outcomes, and expansion through nine specific pathways: socio-economic, cultural, individual, and health system pathways. Additional pathways were workflow improvement and standardisation, evidence-based practice, outcome-based resourcing, collaborators management, and service utilisation.

Using the evaluation framework approach suggested by Scheirer and Schwandt,<sup>8</sup> and by matching the determinant to a phase of the CCASS lifecycle, three domains emerged: The conceptual domain, the outcome domain and the growth domains. The

conceptual domain refers to the CCASS formative years (early stage of screening services either as a ‘green’ project or scale-up of an existing service in a new location); and was primarily affected by socio-economic, cultural, individual, and health system determinants. Over time, CCASS matured to achieve continuous delivery of target outputs and outcomes to be classed as the outcome domain. The primary determinant here included workflow improvement, standardisation, and evidence-based practice. We linked the outcome-focus resourcing, collaborators management, and utilisation determinants to the growth domain as determinants likely to impact CCASS sustainability (Table 1).

## Discussion

Observations from our data show that many factors simultaneously influence CCASS operations, outcomes and sustainability at any given time. Secondly, these factors continuously interact to affect service performance. For example, we found that the ‘individual’ determinant is a composite of culture, literacy, will, and anxiety. These determinants for CCASS are discussed below according to our domain approach.

### Conceptual domain

The determinants of the conceptual domain predominantly influence CCASS during its formative years. In Supplementary Table S1, socio-economic, cultural, individual, and health system-related determinants occurred concurrently. Depending on the context, they can be a barrier, confounder or enabler to the delivery and utilisation of the service. These findings suggest that context is crucial to appraising service variables. For example, for the individual level variable, ‘awareness’, the results show that ‘word-of-mouth’ was the primary means of awareness creation. Another method reported was advocacy by community health (workers) volunteers (CHVs).

We found that community women’s experiences (negative or positive) while receiving CCASS influence what they communicate to peers. Respondents opined those negative experiences arose because of the long waiting time in the clinic, as some women attended the clinic for reasons other than cervical cancer screening. One respondent said, “She has brought a child who is sick; she has queued, goes to the lab, and from there to the pharmacy. By the time she wants to come for cervical cancer screening, it is past time she gives up. I think it is a real concern in our setting”. Thus, women’s experiences can erode the benefit of increased awareness of CCASS.<sup>15</sup> Secondly, the benefits of raising awareness can be skewed by prevailing cultural practices. Our data show that cultur-

al practices influence women’s sustained utilisation of the screening service. “The women are not empowered to decide ... we have a culture where the mother-in-law or the husband decides on behalf of the woman,” said a respondent. Cultural influence resulting in (prohibitive) husbands’ dominance in decision-making on women’s health and the dependence of women on mothers-in-law when making decisions about their health is common in many African climes to confound the effect of increased awareness. Previous studies involving Kenyan<sup>16</sup> and Nigerian<sup>17</sup> populations have shown that awareness alone does not translate to increased cervical cancer screening coverage and uptake. Thus ‘awareness’, while considered an enabler in context, can be confounded by individual and cultural factors. Such interaction among CCASS variables is responsible for effect modification,<sup>18</sup> the disparity in screening outcomes across localities or programs, failures to achieve target outcomes or weak attribution of causes or effects to an intervention.<sup>19</sup>

These data generally suggest that CCASS administrators simultaneously appraise and address determinants as a composite, not individually, and that sustaining an upward trajectory in the utility of screening requires women’s empowerment to utilise CCASS independently. In addition, since cultural practices vary across LMICs, service managers should identify and mitigate cultural practices that disempower women in utilising CCASS.

### Outcome domain

The determinants Workflow improvement/Standardisation and Evidence-based practice were linked to the operational output of cervical cancer screening services. Unexpected factors that may potentially affect CCASS outputs emerged from our data. These included the interaction of two screening methods (self-sampling HPV testing and VIA/VILI) within the same community. A respondent said, “It [HPV testing] was introduced early this year, and you will find out some local women[also]would prefer (self-sampling) HPV testing because they are not positioned in that lithotomy position. Yes, that position comes when she is HPV positive...” another respondent said, “so they [community women] tend to go to receive HPV testing because HPV test is specific. At least there is that assurance that I don’t have the virus; if I don’t have the virus, then it means being safe from cancer of the cervix (the client would say)”. These findings show that the simultaneous deployment of HPV testing with VIA/VILI results in the under-utilisation of VIA/VILI. It also suggests that where more than one screening method is available in a facility, a woman’s preference may interfere with the uptake of a screening method of suitably high diagnostic value. Service managers and administrators must be aware of the dilution effect caused by the simultaneous deployment of

**Table 1. Result table summarizing subthemes, themes and domains derived from IDI respondent feedback.**

Sub-themes*	Themes**	Domains***
CCAS Barriers	Socio economic'	Formative Domain (Relating to the development phase of CCAS)
CCAS Enablers	Cultural determinants	
CCAS Confounders	Individual determinants	
CCAS service types	Health system determinants	
CCAS operations	Evidence Based practice determinants	Outcomes Domain (Relating to the productivity phase of CCAS)
CCAS profile management	Workflow improvement, standardization	
CCAS referral	Outcome-based resourcing determinants	Growth Domain (Relating to the reproductive/expansion phase of CCAS)
Emerging theme	Collaborators management determinants	
CAS Expansion	Utilization determinants	

\*Subtheme illustrates how variables expressed by our respondent affects CCASS delivery. \*\*Themes corresponds to the category of CCASS determinants, and the pathways by which these determinants influence CCASS delivery. \*\*\*By adopting a lifecycle, performance management and evaluation approach, we phased CCASS delivery into the formative, productivity, and replication phases of its maturity akin to the approach by Scheirer and Schwandt.<sup>8</sup> Also, using the same approach, we grouped determinants likely to be preponderant to a phase of CCASS delivery into these domains.

more than one screening method. When inevitable, a robust local monitoring and evaluation mechanism should be in place to maintain workflow effectiveness with evidence-based adjustment. We also found that the simultaneous deployment of HPV screening and VIA/VILI modified the profile of women seeking CCASS. "... with the introduction of HPV testing, we are seeing more HIV-positive clients and older women, but previously we were just seeing women of reproductive age," said a respondent. The change in the profile of women utilising screening is an expected consequence of operating more than one screening method simultaneously or indicates a shift in the penetration rate of one screening method, whether planned or unplanned. Service administrators should expect such changes and continuously evaluate the service to identify how the effect modification occurs and implement a compensatory action.

We also found that service providers translated their clinical observations into action in practice. For example, due to their observations that amenorrhea induced by injectables and pills [name withheld] hinders some Kisumu women from coming for screening until they start experiencing symptoms like unexpected per vaginal (PV) bleeding. If caused by cervical cancer is already at an intermediate or advanced stage; therefore, the nurse providers recommend an age-appropriate baseline cervical cancer screening for all clients on a contraceptive method. In addition, their recommendation for baseline screening is also informed by Kisumu women sometimes misinterpreting family planning as safe sex, which leads to higher HIV incidence amongst persons with FP. These observations are consistent with evidence from Kenya, which reported an association between HIV-1 infection and factors such as pills and injectable FP methods,<sup>20,21</sup> and that long-term use of hormone-based contraceptives are associated with cervical cancer.<sup>22,23</sup> In response, service providers were found to increase counselling and modify approaches on a case-by-case basis to suit the unique situation. This individualised approach creates variation in women's experience and affects the overall quality of care.<sup>24</sup> These findings suggest that reflection-in-action should be integral to CCASS operation because it enables the translation of beliefs, clinical observations and feedback into evidence-based actions required to improve service delivery.<sup>23</sup>

### Growth domain

The Growth domain was influenced by outcomes-based resourcing, service utilisation, and collaborators management. This domain focuses on the extra clinical components likely to affect CCASS sustainability in resource-constrained settings like Kisumu. The need for inclusive collaborators' management arose during the IDI sessions: "we used to do cryotherapy sometimes back as a donor-funded component, but their funding for reproductive health services ended, and so the cryotherapy treatment stopped". According to another respondent, about five donor-funded health partners (HP) have implemented a component of CCASS in their health facilities within the past five years. It resulted in straining already limited facility resources and led to 'donor or health partner induced service fatigue'. Donor funding leads to new work culture and mindset where health administrators and workers undermine their jobs in favour of donor-funded task within the same working hours if additional incentives for the extra duty is available. Hence, inclusive collaborators management considers donor funds, HP's influence on CCASS outcomes and service strengthening and the need to integrate of health partners and local health system priorities. A joint code of conduct or terms of reference to guide HPs' participation in CCASS implementation may be appropriate to unify all party's efforts.<sup>25</sup> This collaborative effort requires the HPs, donors, and local or regional health author-

ities to adopt a transformative and strategic plan, which brings about massive permanent change by addressing a broad range of social, economic and operational problems.<sup>25,26</sup> Such joint code can ensure that funds to CCASS be appropriated and measured by the extent of achievement of targeted CCASS outcomes and not only operational overheads like consumables. Shortage of consumables (like cryotherapy gas) and other operational overheads was a challenge caused by the lack of continuity of funding. In response to this observation, we derived the determinant, 'outcome-based financing', referring to a budgeting ideology where funds for CCASS implementation are linked to predetermined outcomes achievements and not merely execution inputs and processes, e.g., infrastructure or commodity procurements or training activities.

In proposing the 'outcome-based financing', we acknowledge the role of the national health insurance fund (NHIF) to provide coverage and equity to women, particularly those in the mid-low socio-economic category like in Kisumu. Overcoming over-reliance on donor funds and achieving a transition to NHIF-driven CCASS depends on the extent of integration of CCASS into the primary health service offering. It also relies on including specific CCASS outcomes in the national primary care maternal outcome measures or enactment of policies that offer cost protection to women who cannot afford treatment.<sup>27</sup> Funding and financing CCASS can be intricate and sensitive in an integrated setup. For example, to achieve higher coverage of at-risk women, CCASS is reportedly (usually) integrated into the heavily funded HIV/AIDS clinics or FP clinics, of which HIV/FP support services are provided free to women in most countries. Thus, it becomes unclear who pays for cervical cancer screening or case management related to positive cancer finding among women living with HIV/AIDS or receiving FP services. Addressing such intricacies should be the focus of 'outcomes-focused financing'. It is also crucial that all financing or funding models for cervical cancer screening respond to the heterogeneity introduced by factors such as inequality, poverty, health insurance access, cost-effectiveness and perception.<sup>28</sup>

Our data show that continuous skill development, a responsive referral system and enabling infrastructure were supply-side variables in 'service utilisation'. Task shifting of cervical assessment, diagnostics and treatment capabilities to health workers, particularly nurses, enabled a sustained skill pipeline for CCASS utilisation in Kisumu. This non-physician model is essential to ensure a sustainable skill pipeline for CCASS implementation.<sup>29</sup> This non-physician model is relevant because attrition is highest amongst medical practitioners (doctors).<sup>30-32</sup> Also, evidence shows no difference in sensitivity and specificity in VIA and VILI performed by a health worker, nurse, and physician, suggesting that trained health workers can effectively deliver the service.<sup>33</sup>

### Referral management

A robust and integrated referral system continues to be the upside of cancer screening programs regardless of the screening method and approach used. Inferences from Supplementary Table S1 link drop-out/attrition of the 'referred' to economic reasons predominately. Therefore, expanding an affordable health insurance system or a health finance supporting mechanism to include women in the low-income socio-economic strata is a crucial input to improve the effectiveness of referral management. Secondly, community health volunteers (CHVs) played a crucial role in persuading women with positive screening outcomes to reach referral facilities through organised community immersion programs, making CHVs an integral component of CCASS delivery.

Whilst our study provides a detailed understanding of the factors influencing CCASS, some limitations must be acknowledged.

We utilised the lifecycle phase approach to describe the category for which clusters of determinants of CCASS exist. This approach is well-documented for short-life health programs. However, local validation of this approach may be needed where the desire is an organised and integrated CCASS delivery. Secondly, Kisumu has unique socio-economic, demographic and cultural characteristics, which may limit the generalization of our findings to dissimilar settings in LMICs.

## Conclusions

Efficient management and sustenance of outcomes of integrated CCASS delivery in PHC in an LMIC setting like Kisumu require continuous improvements of nine primary determinants: cultural, socioeconomic, individual, health system. Others include evidence-based practice, outcome-based resourcing, workflow improvement and standardization, inclusive health partner management, and service utilization. Furthermore, a phased approach that identifies service determinants preponderant to the CCASS formative, continuous delivery or productivity and replication stages of its lifecycle be adopted and continuously evaluated by local PHC administrators, taking into account locality-specific and context-appropriate factors. Understanding the complex interactions of these CCASS determinants on CCASS outcomes is crucial to improving and sustaining the service.

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