# UPTAKE OF CERVICAL CANCER SCREENING SERVICES AMONG WOMEN AGED 18 TO 59 YEARS IN LAIKIPIA COUNTY, KENYA

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## DECLARATION

This project is my original work and has not been presented for a degree in any other university

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This project report has been submitted for review with my approval as university supervisor.

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## DEDICATION

This study is dedicated to my family, nuclear and extended who have supported me through the journey.

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## ABBREVIATIONS AND ACRONYMS

| | |
|---|---|
| CCS | Cervical Cancer Screening |
| CHVs | Community Health Volunteers |
| CUs | Community Units |
| HCWs | Health Care Workers |
| HBM | Health Belief Model |
| HPV | Human Papilloma Virus |
| KHIS | Kenya Health Information System |
| KDHS | Kenya Demographic Health Survey |
| $KM^2$ | Kilometer Squared |
| LMICs | Low and Middle-Income Countries |
| NACOSTI | National Commission for Science, Technology and Innovation |
| VIA | Visual Inspection by Acetic Acid |
| WHO | World Health Organization |

## DEFINATION OF OPERATIONAL TERMS

| | |
|---|---|
| **Uptake of cervical cancer screening** | The proportion of women eligible for screening who have been screened within 3 years for cervical cancer. |
| **Household** | A person or a group of people (not necessarily related) living under the same roof, and sharing cooking facilities and a living room/sitting room and/or dining area. |
| **Predisposing factors** | Characteristics of an individual that exist prior to a health condition. |
| **Enabling factors** | Logistics that facilitate the access of health services. |
| **Need factors** | The immediate trigger of health service use. |
| **Dependent Variable** | This is the uptake of cervical cancer screening which will be a dichotomous variable showing the proportion of those who has screened in the last three years. |
| **Independent Variable** | These are the predisposing and enabling factors with regard to the uptake of CCS services. In this research predisposing factors will include: Socio-demographic characteristics and Knowledge while enabling factors include: Healthcare systems i.e., availability, accessibility and affordability. |
| **Intervening Variable** | This refers to a factor that, with other factors remaining constant, it is likely to influence the uptake of CCS services. In this case, the intervening variable will be the need factor which will look at self-perceived health status |

## ABSTRACT

Cervical cancer develops in the cervix and is the fourth most common cancer globally, with over 500,000 cases and 300,000 deaths annually (World Bank, 2020). In Low- and Middle-Income Countries (LMICs), it ranks second despite being preventable, leading the WHO to prioritize it (World Bank, 2020). In Kenya, it is the second most common cancer and the leading cause of cancer deaths (World Bank, 2020). Uptake of cervical cancer screening (CCS) is very low at 17% nationally and 19% in Laikipia (KDHS, 2022). CCS is one of a strategy for detecting Human Papilloma virus (HPV) before this becomes cancerous. HPV causes 99% of cervical cancer (World Health Organization, 2021). Studies have shown that socio-demographic characteristics such as employment status, income, and age influence the acceptability of CCS. This descriptive cross-sectional study, guided by the Andersen and Newman Health Services Utilization Model, examined how personal characteristics, attitude, and health system factors influence CCS uptake. The study targeted 254 women aged 18–59 years in Laikipia County who had lived there for at least six months. Four community units were clustered, and proportionate sampling determined participant numbers per unit. Systematic random sampling was used. Data were collected via surveys and key informant interviews, using semi-structured tools. Bivariate and multivariate analysis was done using STATA version 15. Ethical approvals were obtained. Verbal consent was given by participants. CCS uptake was low at 29.1%. Most respondents were married, unemployed, aged 35–59, with secondary education and earning below Kshs. 5,000/month. Uptake was significantly associated with age ($p < 0.001$), employment ($p = 0.013$), income ($p < 0.001$), and specific knowledge (OR = 6.39; $p < 0.001$). Positive attitudes (OR = 18.0) and fewer perceived barriers increased uptake, while good self-health perception reduced it (OR = 0.151). Health system barriers included distance (OR = 0.313), cost, service availability, treatment awareness, and insurance. These findings underscore the urgent need for targeted health education, community-based outreach, improved healthcare accessibility, and the expansion of health insurance schemes to address both individual and systemic barriers and ultimately improve screening uptake and outcomes.

# CHAPTER ONE: INTRODUCTION

## 1.1 Background

Cervical cancer is a cancer that develops in a woman's reproductive organ known as cervix. It can take 10 years or more for symptoms to develop. In early stages, it may not have symptoms, but can be detected during the regular screening. According to World Health Organization (WHO), 99 percent of cases are as a result of Human Papilloma Virus (HPV) infections (World Health Organization, 2021). HPV has been proven to be transmitted through sexual intercourse where persistent exposure leads to cervical cancer.

Globally, this cancer is the fourth most common, with more than five hundred thousand cases being reported and more than three hundred thousand succumbing (World Health Organization, 2021). In addition, global distribution of cervical cancer prevalence shows that socioeconomically disadvantaged population are at high risk due to low awareness and screening coverage (Nganga et al., 2018).

In Low- and Middle-Income Countries (LMICs), surveys have shown that it happens to be the second yet it is a preventable disease (World Health Organization, 2021). According to (Alex K. Mezei, 2017), its incidence rate is five times more in LMICs compared to wealthier countries. It is evidence that the rates defers, with eastern Africa having the highest and they are lowest in Western Asia (Thapa et al., 2018). It is estimated that 84 and 88 percent of incidences and deaths occur in LMICs (Chua et al., 2021). This has prompted the WHO to flag it as priority

Furthermore, in Africa, as at the year 2020, cervical cancer was ranked as the second with 25.6 incidence rate and 17.7 fatality rate per 100,000 persons (World Bank, 2020). This is quite high in comparison to global rates which were 13.3 incidence rate and 7.3 mortality rate per 100,000 persons (World Bank, 2020).

In Kenya, 5236 (12.4% of all forms of cancers) new cases were reported and it was the main condition resulting to deaths from cancer related complications. 3211 (11.9% of all cancer fatality) died in the year 2020. This was also confirmed by Nganga and others hence a major public health concern (Nganga et al., 2018). Further, the incidence rate was 31.3 per 100,000 persons, while fatality rate was 20.6 per 100,000 persons (World Bank, 2020).

In regards to the uptake of CCS, according to the KDHS 2022, only 19% had received the screening services for as at 2022(KDHS, 2022). This is way below the WHO recommended coverage of at least 70 percent.

To mitigate the rates, different preventive, testing, and management techniques have been tested and approved by WHO. HPV vaccination is the common prevention intervention that is advocated for women before they are sexually active. This is because HPV vaccine can prevent up to 99 percent cases. Moreover, early detection of cervical cancer can be managed hence screening have been used in different countries for early detection and management.

In a nutshell, due to public health concerns, research has been conducted for decades to understand the causes, preventive and curative methods of cervical cancer. As a result, since 1980s HPV screening has been advocated because it's the main virus that has been associated with the cancer (Chrysostomou et al., 2018). Further, for cervical cancer to be eliminated, all countries must ensure that the incidence rate is not more the four per 100,000 persons. To achieve this, WHO recommends the 90-70-90 targets by the year 2030 i.e., 90 percent girls HPV vaccination by 15 years of age; 70 percent screening by 35 years of age and 90 percent treatment of suspicious results (World Health Organization, 2021). However, as it was noted earlier, the screening uptake is still low in Kenya and also in Laikipia County.

## 1.2 Problem statement

Cervical cancer is the leading cancer among women in Kenya and the second major cause of cancer-related deaths. In Laikipia County, registry data confirms this burden. Despite free Visual Inspection with Acetic Acid (VIA) screening offered in all government-run health facilities, uptake remains low: only 17% of women nationally and 19% in Laikipia had been screened by 2022 (KDHS, 2022). This falls significantly short of the World Health Organization's global target of 70% screening coverage by age 35 and again by 45, and undermines Kenya's progress toward Sustainable Development Goal 3, which aims to reduce premature mortality from non-communicable diseases.

Multiple barriers contribute to the low uptake of cervical cancer screening (CCS), including socio-demographic factors such as income, employment status, and age (Ampofo et al., 2020) and (Nganga et al., 2018). Financial constraints and fear of costly

treatment deter many women, especially those without insurance or from lower-income groups, an issue also emphasized by World Bank assessments of health financing in LMICs (World Bank, 2020). Additionally, limited awareness, misinformation, and weak health system capacity, including staff shortages, unskilled healthcare providers, and negative provider attitudes, further reduce CCS utilization (Knies et al., 2019).

Although the Kenya Ministry of Health has prioritized cervical cancer prevention through national policies and strategies, Laikipia County still lacks a localized study assessing how individual needs and barriers affect service uptake. This study seeks to address this gap by identifying key factors that influence CCS utilization, with the goal of informing targeted, evidence-based interventions that align with both national health priorities and global cancer elimination efforts

### 1.3 Justification

Cervical cancer is the leading cause of cancer-related deaths among women in Kenya, including in Laikipia County. This is particularly alarming given that 99 percent of cases are linked to the human papillomavirus (HPV), a virus that is both preventable and treatable. In response, the Kenyan government has made significant efforts to improve access to screening services by offering Visual Inspection with Acetic Acid (VIA) screening free of charge in all public health facilities. Despite these initiatives, the uptake of cervical cancer screening remains remarkably low.

This situation highlights the urgent need for further investigation into the factors contributing to the low utilization of available screening services. Understanding these barriers is essential for developing effective strategies to increase uptake and reduce preventable deaths.

The findings from this study will be valuable to a range of stakeholders. Health policymakers and government agencies will gain evidence-based insights to inform the design of targeted awareness campaigns and health policies that address specific community-level challenges. Healthcare providers and program implementers will be better positioned to tailor service delivery and outreach efforts that resonate with the needs and concerns of women in different settings. In addition, non-governmental organizations and development partners working in the field of women’s health can use

the findings to guide the development of locally appropriate and impactful interventions.

Ultimately, the study will contribute to improving women's health outcomes by supporting more effective and informed cervical cancer prevention efforts, particularly for women in Laikipia County and across Kenya.

Laikipia County was selected for this study because, despite commendable efforts by the county government to make cervical cancer screening (CCS) services accessible, uptake remains significantly low. All government health facilities in the county, including level II facilities, currently offer free Visual Inspection with Acetic Acid (VIA) screening. This wide availability reflects a strong institutional commitment to improving women's health and preventing cervical cancer. However, the actual utilization of these services is still far below the World Health Organization's recommended coverage of 70 percent.

The persistent gap between service availability and utilization raises important questions about the underlying barriers to screening, making Laikipia an ideal setting for such an investigation. Moreover, no prior study has been conducted in the county to explore the factors influencing the uptake of cervical cancer screening services. This lack of local data presents a critical knowledge gap that this study seeks to fill. By focusing on Laikipia, the research can generate context-specific insights that are essential for designing targeted and effective interventions within the county and potentially in similar settings across Kenya.

## 1.4 Research questions

1. What is the level of uptake of cervical cancer screening in Laikipia County?
2. What are the individual characteristics influencing the uptake of cervical cancer screening services in Laikipia East sub-county among women aged 18 to 59 years?
3. In what ways do respondents' health beliefs influence their uptake of cervical cancer screening in Laikipia East sub-county among women aged 18 to 59 years?

4. What is the influence of the health system factors on the uptake of cervical cancer screening services in Laikipia East sub-county among women aged 18 to 59 years?

## 1.5 Research hypothesis

Individual characteristics, health beliefs, and health system factors do not influence the uptake of cervical cancer screening services among women aged 18 to 59 years in Laikipia County.

## 1.6 Objectives of the study

### 1.6.1. Broad Objective:

To investigate the determinants of uptake of cervical cancer screening services among women aged 18 to 59 years in Laikipia East sub-county, Kenya

### 1.6.2 Specific Objectives:

1. To determine the level of cervical cancer screening uptake in Laikipia County.
2. To identify individual characteristics influencing the uptake of cervical cancer screening services in Laikipia County among women aged 18 to 59 years.
3. To determine the influence of respondents' health beliefs on the uptake of cervical cancer screening in Laikipia County among women aged 18 to 59 years.
4. To determine the influence of the health system factors on the uptake of cervical cancer screening services in Laikipia East sub-county among women aged 18 to 59 years.

## 1.7 Significant of the study

This study makes several important contributions to cervical cancer prevention efforts. First, it provides localized data on the uptake of cervical cancer screening (CCS) in Laikipia County, highlighting key demographic, social, and economic factors that influence screening behavior. This evidence fills a gap in context-specific information, which is essential for designing effective health interventions.

Second, by sharing the findings with healthcare workers and county health management teams, the study supports the development of targeted strategies and policies aimed at increasing CCS uptake. The practical insights from this research can guide the allocation of resources, training of healthcare providers, and community engagement efforts to improve service delivery.

Finally, the study offers a foundation for other counties and countries facing similar challenges. It can serve as a baseline for future research, policy development, and project implementation. By identifying barriers and opportunities for improving CCS, this study contributes to the broader goal of reducing cervical cancer incidence and promoting equitable access to preventive healthcare services

## 1.8 Limitations and delimitations

The limitations included the self-reporting on screening and the absence of the sampled household members. To minimize recall biases, only those who were screened within the last three years (post-COVID-19) were considered as screened. This is because the guideline requires women to be screened once every three years. On the other hand, for households where members were absent, the household was revisited later in the day. Few household members were hence no replacement was done.

The delimitation of this study is that it was conducted in Laikipia County only hence this cannot be generalized to other counties.

## 1.9 Conceptual framework:

This framework has been developed based on Andersen's behavioral model (Ronald M. Andersen, 1995)**.**

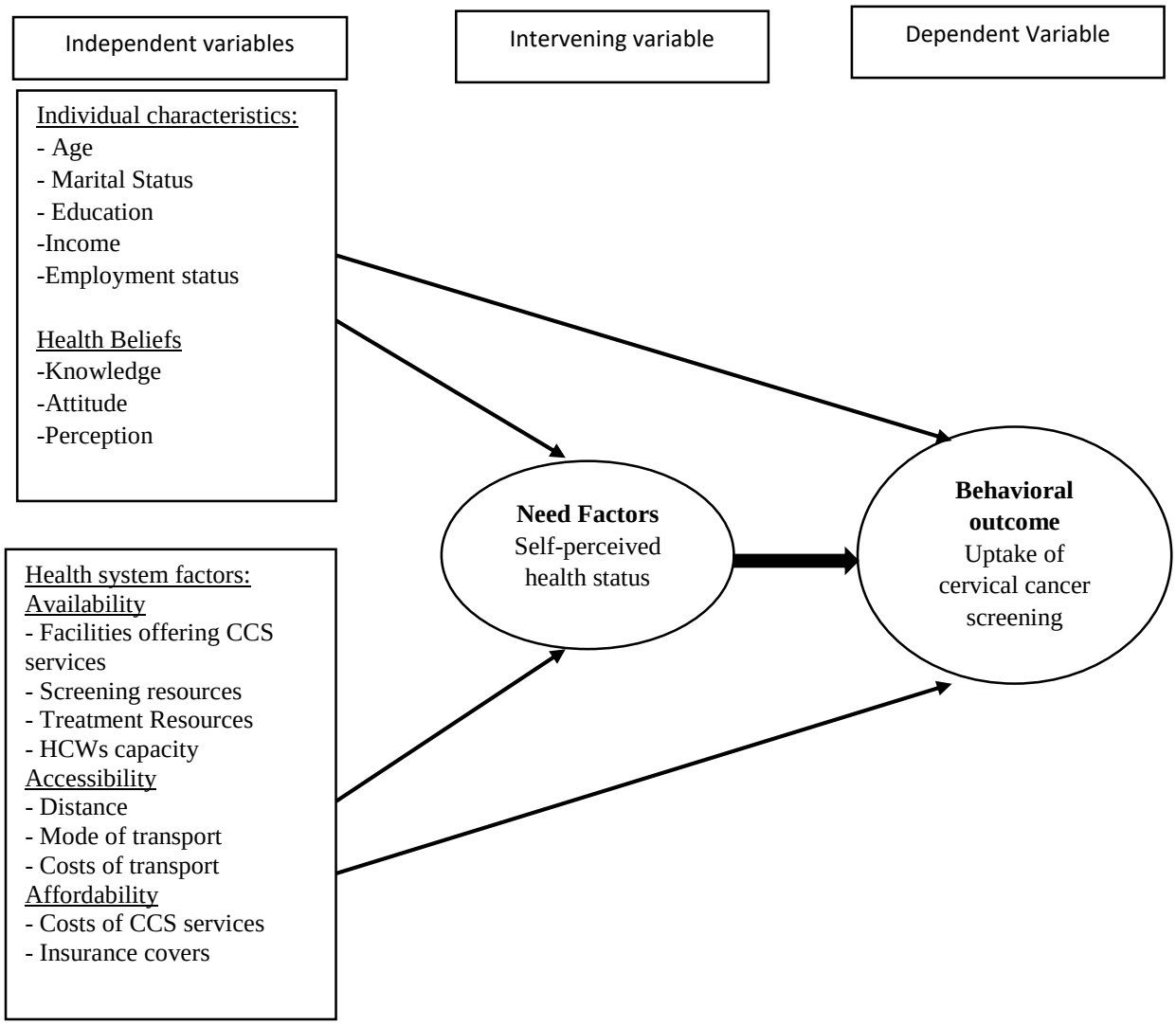


FIGURE 1:CONCEPTUAL FRAMEWORK

Source: Adopted and modified from Andersen Newman model of health care utilization (1995)

# CHAPTER TWO: LITERATURE REVIEW

## 2.1 Introduction

The chapter presents a review of past studies to get a snapshot finding on factors attributed to the uptake of CCS and identify the existing gap. Predisposing. Enabling and needs factors based on Andersen Newman have also been discussed.

Cervical cancer is a major global health issue, ranking as the fourth most common cancer among women, with most cases caused by high-risk HPV infections. While high-income countries have reduced cervical cancer incidence through effective screening and vaccination, low- and middle-income countries (LMICs) continue to experience high rates due to limited healthcare access, low HPV vaccine coverage, and late diagnosis. Over 85% of global cases and deaths occur in LMICs, especially in Sub-Saharan Africa, where cervical cancer is a leading cause of cancer-related deaths among women.

In Kenya, cervical cancer is the second most common cancer among women and the leading cause of cancer deaths in women aged 15–44. The country faces low screening uptake, limited awareness, and vaccine hesitancy despite introducing the HPV vaccine in 2019. High HIV prevalence further increases the risk of cervical cancer. The government has implemented strategies like integrating screening into reproductive health services and adopting low-cost methods such as visual inspection with acetic acid (VIA). However, gaps remain, including inadequate funding, infrastructure, and community engagement.

To address the cervical cancer burden, especially in LMICs like Kenya, there is a pressing need for improved prevention, education, and strengthened health systems, along with innovative approaches like task-shifting, mobile health outreach, and self-sampling HPV tests.

### Cervical Cancer Screening

It occurs in the cervix, a woman reproductive organ which is an entrance to the uterus from the vagina. According to the national guideline (Ministry of Health, 2018) the HPV infection leads to 99 percent of cervical cancer cases mainly resulting from: sexual transmission, co-infections*;* HIV/AIDS immunosuppression*;* tobacco use.

In Kenya, CCS targeted population is the women aged between 25 to 49 years. However, younger women who are sexually active are also eligible. Women above 49 years are also advised to be screened after every five years because they are also susceptible (Ministry of Health, 2018).

WHO also states that 99 percent of cervical cancer results from HPV infection. Interestingly, this can be managed and can be treated if detected early enough. It is for this reason that various screening mechanisms have been tested and validated for early diagnosis of the cancer. In Kenya, the most common screening methods are: VIAVILI, Pap Smear testing and HPV test.

## 2.2 Literature review:

### 2.2.1 Sociodemographic characteristics on uptake of CCS services

This study have indicated that most of individual characteristics have direct association with the uptake of CCS services. Characteristics that have greatly been linked to uptake of CCS include age, marriage, education, employment, and income (Akinyemiju et al., 2015), (Chidyaonga-Maseko et al., 2015), *and* (Morema et al., 2014).

Age: Chidyaonga-Maseko and others and Aynalem and colleagues stated that older women have higher tendency to screen (Chidyaonga-Maseko et al., 2015) and (Aynalem et al., 2020). Also, Morema and colleagues noted that those who had screened were mainly older women (Morema et al., 2014). However, a systematic review by Marques noted that most studies contradicted on the influence of age on CCS participation (Marques et al., 2020).

Marital status: Another variable linked to uptake of CCS services is marital status. Studies have been contradicting in that, some studies showed that those married were tend to screen while others were of contrary opinion. For example, studies by Aynalem and colleagues and Chidyaonga-Maseko and colleagues learnt that married women were more knowledgeable on cervical cancer risks and hence more willing to screen (Aynalem et al., 2020) and (Chidyaonga-Maseko et al., 2015). However a studies by Morema and colleagues and Abamecha and others stated that marital status had no influence on determining the uptake of CCS (Morema et al., 2014) and (Abamecha et al., 2019).

Education level: According to most of the studies, as a woman level of educated progressed, the proportion of those screened increased (Aynalem et al., 2020), (Marques et al., 2020), and (Morema et al., 2014). This was mainly attributed to the

exposure that comes with training where those who have gone to schools are more likely to have heard about good health seeking behavior. As a result, when such people are called upon to go for screening, they are more likely to hid to the request whenever they hear about screening from healthcare providers or other communication channels.

Employment Status: Abamecha and colleagues did not find and significant difference between employed and unemployed with regard to participating in CCS (Abamecha et al., 2019).

Level of income: Women who have relatively or high level of income have more confidence in seeking CCS services (Chidyaonga-Maseko et al., 2015), (Morema et al., 2014) and (Marques et al., 2020). Those whose socioeconomic status was estimated to be below the average were less inclined to seeking CCS services, (Marques et al., 2020) and (Chidyaonga-Maseko et al., 2015). This may be attributed to the fear of outcomes where most perceived the costs of treatment as high and hence cannot afford. In contrary, Abamecha and colleagues' study showed that income level had no significant association to likelihood to participate in CCS (Abamecha et al., 2019).

### 2.2.2 Cervical cancer screening knowledge and beliefs

Knowing about the cancer and how it can be screened is paramount to individuals' decision to seek screening services. However, most people do not clearly understand what is cervical cancer and how it is different from other forms of cancers.

In most of the studies, over half of the study participants had not screened (Abamecha et al., 2019), (Aynalem et al., 2020), (Morema et al., 2014), and (Pittalis et al., 2020). This is similar to uptake level in Kenya which as at 2022, it was 17 percent. This is mainly due to insufficient knowledge about cervical cancer and CCS (Ba-break et al., 2015), (Chidyaonga-Maseko et al., 2015), (Marques et al., 2020), (Morema et al., 2014), and (Pittalis et al., 2020). A review of the studies that have been conducted in Malawi, a LMIC in Africa, noted that knowledge was a common barrier to accelerating the uptake of CCS. The study highlighted that people didn't know causes and preventive measures. Most had not heard about VIA screening despite having cervical cancer program for more than ten years in the country (Pittalis et al., 2020). The study also agreed that having an effective program that advocates for screening can have positive impact on screening acceptance. Pittalis and colleagues recommended incorporation of educational component in the programme and also community

engagement and sensitization in order to have more women receiving CCS services (Pittalis et al., 2020).

Another study in Europe also concurred where Marques and colleagues admitted that less knowledgeable women were less likely to screen (Marques et al., 2020). Further, those who were not aware of CCS services were less likely to screened. They proposed that providing relevant simple information on CCS can facilitate the uptake. Like Pittalis and others, they encouraged the collaboration with community stakeholders and also local languages for Information, Education and Communication (IEC) materials in order to enhance community understanding.

A systematic study review of studies from LMIC on underutilization of CCS services had similar observations. Most screened women were more informed about cervical cancer and CCS. On the other hand, those who did not have adequate knowledge were not likely to screen and they mostly seek medical attention when symptoms are clearly and are not able to live a normal life. At this point, the cancer is more complicated and malignant (Chidyaonga-Maseko et al., 2015). Also, the higher the woman's knowledge the more they were willing to utilize CCS services. They concluded that in deed, lack of knowledge was responsible hindered the increase in uptake of CCS services.

Morema and colleagues conducted a study in Kenya where they also observed that knowledge has a great impact on intention and uptake of CCS services (Morema et al., 2014). They confirmed that indeed, a significant share of those who had been screened knew signs and symptoms. Also, those who were categorized as not knowledgeable were 18 times more likely not to have screened (Morema et al., 2014).

More studies in Nigeria and Ethiopia, (Ba-break et al., 2015), (Aynalem et al., 2020), and (Abamecha et al., 2019) concurred with others. They noted that knowledge had greatly contributed to low uptake of CCS where in Ethiopia, less than 10 percent women had screened (Abamecha et al., 2019) and (Aynalem et al., 2020). Ba-break confirmed that inadequate knowledge about cervical cancer contributed to low uptake of CCS (Ba-break et al., 2015). Increasing knowledge increased the likelihood of the uptake of CCS services (ibid).

### 2.2.3 Healthcare systems perceptions and uptake of CCS services

Akinyemiju and colleagues, (Akinyemiju et al., 2015),assessed the uptake of CCS services in South Africa based on the five healthcare constructs from Penchansky and

Thomas framework (R. Penchasky & J Thomas, 1981). These constructs were affordability, availability, accessibility, accommodation and acceptability of health services. In their study, only affordability, availability and accessibility significant between screened and unscreened women. On the other hand, accommodation and acceptability were not significant. Despite knowledge, other factors such as accessibility, acceptability, affordability and quality of screening and treatment services, can have influence into behavior change (Ba-break et al., 2015).

One of the health systems factors is the availability of services. This includes facilities offering CCS services, screening and treatment resources and health care workers capacity. The distribution of services significantly affects the uptake of services (Pittalis et al., 2020) in that, if the nearest health facilities do not offer the screening services, women are less likely to participate in screening.

Chidyaonga-Maseko and colleagues did a systematic review of articles from LMIC where they concurred with Pittalis and others that the location of the health facility greatly determines the uptake of CCS services (Chidyaonga-Maseko et al., 2015). It was noted that people in remote places were less likely to seek CCS services (Chidyaonga-Maseko et al., 2015).

Another determinant of CCS uptake is the adequacy of screening and treatment resources. Studies have shown that inadequate resources have pushed people away from seeking services. Chidyaonga-Maseko and colleagues and Pittalis and colleagues agreed that shortages of Health Care Workers (HCWs), medical supplies, and drugs needed to screen and treat also undermined the uptake of CCS services (Chidyaonga-Maseko et al., 2015) and (Pittalis et al., 2020). Further, Pittalis and colleagues stated that lack of screening space leads to low uptake of CCS (Pittalis et al., 2020). This is because most health facilities use family planning rooms which women said they did not have privacy a challenge that was also noted by Chidyaonga-Maseko and colleagues (Chidyaonga-Maseko et al., 2015).

In healthcare system, HCWs ability to deliver quality services greatly influence the health seeking behaviors of the community (Chidyaonga-Maseko et al., 2015). When community have confidence with the HCWs, they tend to seek more healthcare services. This is evidenced by a study by Pittalis and colleagues where participants were okey with any HCW as long as they were skilled (Pittalis et al., 2020). However, the participants had more preference of medical officers compared to other cadre such as

nurses/midwives (Pittalis et al., 2020). This is because they perceived medical officers as more knowledgeable even though they trusted nurse/midwives.

Gender of the HCWs also influence the uptake of CCS since it is very intrusive. For instance, Muslims faithful prefer female HCWs because their religion does not allow a man other than their husbands to see their privacy. Also, embarrassment and stigma can discourage women from facing male HCWs hence forcing them to shy away from seeking CCS services. Marques and colleagues confirmed that in deed, lack of female HCWs was a barrier to uptake of CCS in Europe (Marques et al., 2020).

In addition, accessibility can also affect the uptake of CCS. Penchansky and Thomas define accessibility as the geographic distance to the facility and convenience of travel (R. Penchasky & J Thomas, 1981). In this context, we look at accessibility in terms of distance to the nearest facility offering CCS services, mode of transport and travel cost implications.

Studies in South Africa, Nigeria, and Malawi noted that those who travelled a distance more than five kilometers were less likely to screen because they were not satisfied by the distances to the health services (Akinyemiju et al., 2015), (Ba-break et al., 2015) and (Pittalis et al., 2020). Also, the means of transport do influence the uptake of CCS. This is because some facilities may be within the recommended less than five kilometers but there are no means of transport. Walking to such facility can therefore influence the health seeking behaviors among the community member. According to Akinyemiju and others, those who use public/biking/walking as primary means of transportation were had less probability of screening with screening compared to those using private means (Akinyemiju et al., 2015). In the study, most of the women who had been screened had private mode of transport and traveled to the facility in less than 25 minutes.

Cervical cancer screening services may be free but can incur indirect costs such as costs of travel to the service provider. People with low socioeconomic status may have challenges to accessing the facility due to travel costs. According to Chidyaonga-Maseko and colleagues, transport costs also influence the uptake where those who felt it will cost a fortune to travel to the facility were less willing to seek screening services (Chidyaonga-Maseko et al., 2015). Affordability is another key variable the effect the level of uptake of CCs. This refers to individuals ability and willingness to part with

some money for certain services (R. Penchasky & J Thomas, 1981). Payments can be out-of-pocket or paid through the medical insurance cover. Insurance can be an enabling factor in the utilization of healthcare services. Marques and other noted that funding was strongly associated with the uptake of services (Marques et al., 2020).

### 2.2.4 Need Factors**:**

This refers to immediate trigger of health service use.(Newman, 1995). Self-perceived health status has been associated with need factors. This is mainly on perceived severity of an illness where studies have shown that perceived severity greatly influence the utilization of health services (Harris et al., 2021).

## 2.3 Theoretical framework:

This study adopted the Andersen model which is widely used to identify facilitators to the use of health services. It is a behavioral model which was first developed in 1990s but is has be revised over the years. Originally, the aim was to understand how and why people use healthcare services (Newman, 1995). The Andersen model can be used to assess community and individual factors. However, this study focused on individual factors which, according to Andersen, are Predisposing and enabling factors as independent variables while the need factors will act as the intervening variable (Newman, 1995).

Predisposing Factors: Refers to individual socio-cultural features that exist before a health condition is diagnosed. Studies have shown that these factors influence the health seeking behaviour prior, during or after an illness is diagnosed. These factors include: demography (e.g., age and gender); social cultures (e.g., level if education, employment status, religion, and ethnicity and health beliefs (e.g., knowledge and attitude) (Newman, 1995).

Enabling Factors: These refers to ability to access the services in terms of availability of services, distance, and affordability. In this context, we take into consideration the distance, travel costs; and insurance status and their influence the uptake of CCS services (Newman, 1995).

Need Factors: This refers to the immediate trigger of health service use. Studies have shown that perceived need helps better understand individual action to participate or not participate in health activity.

In a nutshell, despite a wealth of studies on sociodemographic and health system factors, there is a lack of consensus and clarity on which individual-level sociodemographic characteristics most strongly influence CCS uptake especially age, marital status, and income, due to inconsistent findings across different contexts. Furthermore, while knowledge is consistently identified as a key barrier, few studies integrate all three components of the Andersen model holistically. Most studies examine these factors in isolation rather than exploring how they interact.

The main gap is the fragmented and inconsistent understanding of how sociodemographic, knowledge-based, and health system factors interact to influence CCS uptake. There is a need for integrated, context-specific studies that apply the Andersen model comprehensively, especially focusing on the interplay between individual knowledge, enabling conditions, and perceived need

# CHAPTER THREE: MATERIALS AND METHODS

## 3.1 Introduction

This section outlines the study's design, location, target population, sampling strategy, data collection and analysis methods, as well as the ethical considerations that will be observed.

## 3.2 Study design

A descriptive cross-sectional study design was adopted because it is well-suited for assessing the current status of variables within a specific population at a single point in time. This design is appropriate for determining the prevalence of specific characteristics, behaviors, or conditions, and it allows for the collection of both quantitative and qualitative data efficiently within a limited timeframe and with limited resources.

The study was conducted in Laikipia East Sub County (See appendix VII)**,** an area of interest due to its unique demographic, health, or social characteristics relevant to the research objectives. The use of a semi-structured questionnaire administered (See appendix II) to 264 respondents enabled the systematic collection of quantitative data**,** allowing for measurable and comparable results across the sample.

To enrich the findings and provide context to the quantitative data, key informant interviews (KIIs) were conducted using a Key Informant Guide (See appendix III)**.** These interviews targeted one healthcare worker (HCW) per community unit**,** leveraging their in-depth knowledge and experience within the community. This qualitative component was essential to gaining nuanced insights, understanding underlying issues, and validating or expanding upon the trends observed in the survey data.

Overall, the mixed-method approach strengthens the study by providing both breadth and depth, allowing for a comprehensive understanding of the phenomena under investigation

## 3.3 Variables

### 3.3.1 Independent variables

These are the predisposing and enabling factors concerning the uptake of CCS services. In this research, predisposing factors included: individual characteristics and health

beliefs while enabling factors include: Health systems factors i.e., availability, accessibility and affordability.

### 3.3.2 Dependent variable

The independent variable was the uptake that is the proportion of those who have screened in the last three years.

Definition: Whether a woman has ever undergone cervical cancer screening through methods such as Pap smear, Visual Inspection with Acetic Acid (VIA), or HPV testing.

*Categories and Operationalization:*

*Screened*: Respondent reports having undergone cervical cancer screening at least once in the last three years.

*Not Screened*: Respondent reports to have not undergone any form of cervical cancer screening in the last three years

*Uptake:* The proportion of eligible women (based on national guidelines) who have ever been screened.

*Operational Definition:*

Screening Uptake (%) = (Total number of eligible women /
Number of women screened) ×100
Knowledge or awareness about cervical cancer screening methods and their availability.

## 3.4 Study setting

The survey was carried out among women aged 18 to 59 years in Laikipia East, a sub-county in Laikipia County, Kenya. It is located at the foot of Mount Kenya on the lee ward side. The sub-county has five wards and covers an area of 1458.7 $KM^2$. According to population projections since the national census that was conducted in 2019, as of 2023, the estimated population is 162, 955 where women eligible for cervical cancer screening are 12,764. The main socioeconomic activities include farming and cattle grazing. The sub-county has 35 health facilities where 27 are owned by the government, 6 are private and 2 are faith-based. There is one level V facility; two-level IV facilities; two level III and 30 level II facilities.

## 3.5 Targeted population

These were all women aged 18 to 59 years living in Laikipia East sub county. Although the recommended age is 25 to 49 years, the age limit was expanded to 18 to 59 years to strengthen the research. This is because studies have shown that older women are more likely to be screened for cervical cancer. As of 2023, the population is 12,764. This population was obtained from the 2019 census with an increment based on population growth rates from 2019 to 2023.

*Inclusion criteria:*

The study included all women in the Laikipia East sub-county aged 18 to 59 years who had stayed for six months or more and had given oral consent to participate.

*Exclusion criteria:*

All eligible women who could not hear or speak and those who were in critical health conditions both mentally and physically.

## 3.6 Sampling techniques and sample size

### 3.6.1 Sampling techniques

Sampling techniques included sampling frame and sample size determination. In this study, sampling frame used the Community Units (CUs) as clusters in Tigithi ward, a ward in the Laikipia East subcounty. Tigithi ward had been selected because of ethnic and religious diversity. With the support of Community Health Volunteers (CHVs), all households per CU were listed. Total number of households was used to determine the proportion of households to be selected per unit. A simple random probability sampling method using a mobile random number generator application was used to select the households that participated in this study.

At the household level, in cases where there was more than one woman who met the selection criteria, the woman who had given birth recently was used to participate. If neither had given birth, the older woman participated.

### 3.6.2 Sample size determination

Fishers' formula, a formula that is highly recognized and used in such research design was adopted to get the sample size (Fisher, 1998):

$$n = \frac{Z^2 \times pq}{e^2}$$

Where:

n = the required minimum sample size for sufficient representation

Z = Confidence Interval at 95%, 1.96

p = Proportion of cervical cancer screening uptake in Laikipia County according to KDHS 2022

q = Proportion of those who have not screened in Laikipia County based on KDHS 2022 report (1-p)

e = margin of error i.e., acceptable deviation from exact value will be at 0.05.

The sample was calculated as follows:

$$n = \frac{1.96^2 \times 0.19(1 - 0.19)}{0.05^2}$$

n = 231

A 10% sample size (23 respondents) was added to ensure that the response rate was within the acceptable limit giving a total of 254.

### 3.6.3 Sample frame

The sampling frame refers to the sample selection process (Mooney & Garber, 2019). In this study, the sample size was drawn from four community units (Table 1).

Table 3.1: Sample distribution

**TABLE 1: SAMPLE DISTRIBUTION**

| **Community Units** | **Women aged 18 to 59 years** | **Proportion of sample size** | **Number of participants to participate (Sample size) N= 204** |
|---|---|---|---|
| Lamuria | 3478 | 27.2% | 69 |
| Matanya | 3813 | 29.9% | 76 |
| Solio | 2419 | 19.0% | 48 |
| Kihato | 3054 | 23.9% | 61 |
| **Total** | **12,764** | **100%** | **254** |

## 3.7 Data collection instrument

Both quantitative and qualitative data were collected. One-on-one surveys and key informant interviews were done by use of a semi-structured questionnaire and key informant guide. To the best of my knowledge, there is no questionnaire on cervical cancer screening that has been validated for Kenya setup. As a result, this study resolved to adopt other breast and cervical cancer-validated questionnaires (Appendix I) that assess individual attitudes. Most of the questions were based on Champion's Health Belief Model Scale (Htay et al., 2021) and EuroQol Group EQ-5D (Euroqol Group,

2009). Both tools assessed the individual characteristics, health system factors, and health beliefs on cervical cancer screening. The interview was administered by trained research assistants.

### 3.8 Pretesting

The questionnaires were pre-tested to assess if respondents were able to understand, interpret it as intended, and accept the tool. It also facilitated its improvement before the study started. This was done in a smaller group with similar characteristics. Ten percent of the sample size of 254 which translated to 25 was used to pretest. Muhotetu community unit in Laikipia West sub county was used because it shares similar characteristics with the targeted population.

#### 3.8.1 Validity

The pre-test and guidance from the supervisor, the validity of the tools were assessed to determine if the items in the questionnaire measured the constructs. The study used the pre-test data to recognize unclear questions. The questions were revised and updated to meet the objectives. The researcher ensured that the questions were not biased or emotional and that all the questions focused on purpose of this study.

#### 3.8.2 Reliability test

Cronbach's Alpha rule of thumb was adopted to assess the internal consistency of the Likert questions before the data was analyzed. This test is recommended where questions have several options that require a Likert scale. The researcher administered the research instruments and tabulated their scores. In this study, items that scored at least 0.7 were accepted as indicated in table 2.

**TABLE 2: CRONBACH'S ALPHA RULE OF THUMB**

| **Cronbach's Alpha (α)** | **Internal Consistency** |
|---|---|
| $\alpha \geq 0.9$ | Excellent |
| $0.9 > \alpha \geq 0.8$ | Good |
| $0.8 > \alpha \geq 0.7$ | Acceptable |
| $0.7 > \alpha \geq 0.6$ | Questionable |
| $0.6 > \alpha \geq 0.5$ | Poor |
| $0.5 > \alpha$ | Unacceptable |

*Source:* Coefficient alpha and the internal structure of tests (Cronbach, 1951)

**Inter reliability test**

Inter-item correlation to identify correlations was done. Items with correlations greater than 0.7 were retained while the rest were eliminated(Dellai & Slimene, 2021; Hinkin et al., 1997). This is because low correlations may not be a reliable representation of the construct under investigation(Churchill, 1979).

All the variables concerning benefits were included since alpha test was greater than 0.7. For the variables in relation to barriers, time consuming, cost of screening, and other problems were dropped since their internal consistencies were less than 0.7. Further, on self-perception, the variable feels anxious was also dropped.

TABLE 3: RELIABILITY TEST

| The Inter reliability test - Cronbach alpha | | | |
|---|---|---|---|
| **Variable** | **Number of Items** | **Reliability Cronbach's alpha** | **Comment** |
| **Barrier** | **3** | 0.7013 | **Accept** |
| **Benefits** | **3** | 0.7971 | **Accept** |
| **Self-perception** | **2** | 0.7359 | **Accept** |
| **Overall** | **8** | 0.8617 | **Accept** |

### 3.9 Data collection

The primary data were collected from 241 women who are 18 to 59 years of age. The questionnaires were administered face to face by use of Android phones and transmitted using kobo collect (A phone/computer application used for data collection). There were two research assistants during data collection for five hours a day for four days. The research assistants were trained before data collection and the researcher remained available to clarify if concerns arose during the data collection.

### 3.10 Data analysis

Data were exported, cleaned, summarized, and statistically analyzed using STATA software version 15. Data cleaning was done by removing missing data, duplicates, and outliers. The results were subjected to bivariate and multivariate analysis to determine the empirical associations between variables. This helped in testing hypotheses of association where results are be in tables, charts, and graphs.

### 3.11 Ethics considerations

The researcher sought necessary research approvals from Kenyatta University, the County Government of Laikipia and NACOSTI. The researcher obtained ethical clearance from the Kenyatta University Ethical Committee (Ref No.:

PKU/2907/I12030) (See appendix IV and V). In addition, the researcher obtained a permit from NACOSTI (License No.: NACOSTI/24/34900) (See appendix VI) Similarly, the research obtained authorization from the county during the data collection.

This study asked questions to evaluate community knowledge on cervical cancer, cervical cancer screening, and individuals' perceptions of their ability to receive screening services. This helped inform the county government of Laikipia on strategies to improve the uptake of cervical cancer screening.

During data collection, respondents were informed of the reason for and the importance of the research being done. The interviews were conducted in a private setting and remain confidential. The respondents were at liberty to drop out of the study at any point for whatever reason. We did not ask for any personal identification information and everything is kept private and only shared with the study team. However, for participants who showed interest in learning more, follow-up contact details were given to them for further guidance.

# CHAPTER FOUR: RESULTS

## 4.1 Introduction

This chapter presents the findings in the same sequence as the research objectives. The results cover the uptake levels of cervical cancer screening, individual characteristics factors, health belief factors, and health system factors that influence the uptake of cervical cancer screening. This provides a summary of the obtained results.

The study included a sample size of 254 participants. Of these, 241 questionnaires were administered using a simple random sampling method, achieving a response rate of 95%. Furthermore, interviews were conducted with 5 key informants, all participating, resulting in a 100% response rate.

## 4.2 Social demographic characteristics

Majority of the respondents were women aged 35-49 years and 50-59 years at 95(39.42%) and 84(34.85%) consecutively while the least were 18-24 years. Majority were married: 184(76.35%); and had attained secondary school level of education: 104 (43.15%). Also, majority were unemployed 179(74.27%) and were earning less than Kshs. 5,000 per month: 204 (84.65%) (Table 4)

TABLE 4: DISTRIBUTION OF INDIVIDUAL CHARACTERISTICS

| Variables | Categories | Frequency (n=241) | Proportion (%) |
|---|---|---|---|
| **Age (Years)** | 18-24 | 14 | 5.81% |
| | 25-34 | 48 | 19.92% |
| | 35-49 | 95 | 39.42% |
| | 50-59 | 84 | 34.85% |
| **Marital status** | Married | 184 | 76.35% |
| | Single | 29 | 12.03% |
| | Divorced/Widowed | 28 | 11.62% |
| **Education** | No formal education | 25 | 10.37% |
| | Primary school | 97 | 40.25% |
| | Secondary school | 104 | 43.15% |
| | Tertiary education | 15 | 6.22% |
| **Employment** | Employed | 13 | 5.39% |
| | Self-employed | 49 | 20.33% |
| | Unemployed | 179 | 74.27% |
| **Monthly Income (Kshs)** | <5000 | 204 | 84.65% |
| | > 5000 | 37 | 15.35% |

## 4.3 Level of uptake of cervical cancer screening services

This study aimed to evaluate the extent to which individuals have adhered to the Ministry of Health (MOH) recommendations by undergoing CCS at least once in the past three years. As shown in Figure 2, the findings reveal that only 70 participants (29.1%) had undergone screening within this timeframe

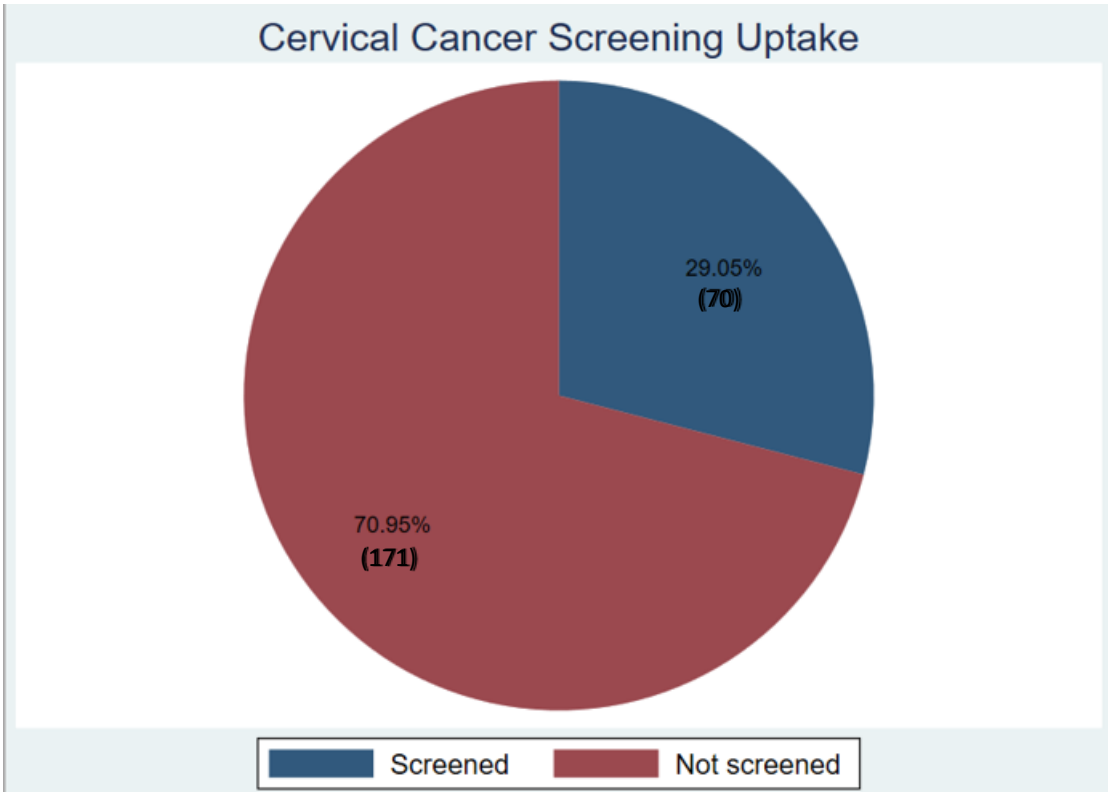


FIGURE 2: CERVICAL CANCER SCREENING UPTAKE

## 4.4 Individual characteristics influencing the uptake of cervical cancer screening

The study analyzed the distribution of participants based on various individual characteristics and conducted a bivariate analysis to examine the relationship between individual characteristics and the uptake of cervical cancer screening. The analysis revealed that age ($p$-value<0.001), employment status ($p$-value=0.013), and monthly income level ($p$-value<0.001) were significantly associated with the uptake of cervical cancer screening. Conversely, marital status and education level did not show significant associations (table 4)

**TABLE 5: INDIVIDUAL CHARACTERISTICS INFLUENCE ON CCS UPTAKE**

| Variables | Categories | Screened | Not screened | *P*-value | OR (95%CI) |
|---|---|---|---|---|---|
| **Age (Years)** | 18-24 | 2(14.29) | 12(85.71) | **<0.001*** | Ref |
| | 25-34 | 7(14.58) | 41(85.42) | | **1.02(0.188-5.600) *** |
| | 35-49 | 42(44.21) | 53(55.79) | | **4.754(1.008-22.412) *** |
| | 50-59 | 19(22.62) | 65(77.38) | | **1.754(0.361-8.530) *** |
| **Marital status** | Married | 58(31.52) | 126(68.48) | 0.314 | Ref |
| | Single | 6(20.69) | 23(79.31) | | 0.567(0.129-1.467) |
| | Divorced/Widowed | 6(21.43) | 22(78.57) | | 0.592(0.228-1.539) |
| **Education** | No formal education | 7(28) | 18(72) | 0.884 | Ref |
| | Primary school | 26(26.8) | 71(73.2) | | 0.942(0.353-2.514) |
| | Secondary school | 33(31.73) | 71(68.27) | | 1.195(0.454-3.139) |
| | Tertiary education | 4(26.67) | 11(73.33) | | 0.935(0.222-3.944) |
| **Employment** | Employed | 5(38.46) | 8(61.54) | **0.013*** | Ref |
| | Self-employed | 22(44.9) | 27(55.1) | | **1.304(0.373-4.556) *** |
| | Unemployed | 43(24.02) | 136(75.98) | | **0.506(0.157-1.628) *** |
| **Monthly Income (Kshs)** | <5000 | 49(24.02) | 155(75.98) | **<0.001*** | Ref |
| | > 5000 | 21(56.76) | 16(43.24) | | **4.152(2.010-0.435) *** |

Further analysis was conducted on the significant variables using multivariate analysis to evaluate the likelihood of cervical cancer screening across different categories. Regarding age, women in all age categories were more likely to undergo screening, with those aged 35-49 years being the most likely to get screened, with an odds ratio (OR) of 4.75(95%CI: 1.01-22.42), as shown in table 5 Additionally, self-employed women had a higher likelihood of screening, with an OR of 1.30(95%CI: 0.37-4.56). Women with a monthly income of more than Kshs. 5000 were four times more likely to get screened, with an OR of 4.14(95% CI: 2.01-8.58) as detailed in table 5

### 4.5 Health beliefs associated with uptake of cervical cancer screening

An in-depth analysis was conducted to examine the relationship between various health beliefs and cervical cancer screening outcomes. This study focused on several variables: knowledge about cervical cancer and cervical cancer screening, attitudes towards the benefits and barriers of cervical cancer screening, and self-perception of health status.

The findings indicated that a significant proportion of participants, 218 individuals (90.46%) were knowledgeable about cervical cancer. Despite this high level of knowledge, only 66 participants (30.14%) from this group had undergone screening. On the other hand, among the 23 participants (9.54%) who were not knowledgeable about cervical cancer, only 4 (17.39%) had been screened. However, bivariate analysis revealed that the level of knowledge about cervical cancer was not significantly associated with the uptake of cervical cancer screening (*p*-value = 0.195), (Table 6)

The study also assessed participants knowledge about cervical cancer screening. Only 22 (9.13%) participants were knowledge in this area. Of those knowledgeable, 15 (68.18%) had been screened for cervical cancer, compared to 55 (25.11%) of those with poor knowledge about cervical cancer screening who had been screened. This difference was statistically significant, with knowledge about cervical cancer screening being significantly associated with the uptake of the screening (*p*-value <0.001). Further analysis indicate that knowledgeable individuals were six times more likely to undergo screening compared to those who were not knowledgeable, [ OR = 6.39 (95% CI: 2.477-16.483)] (Table 5)

Attitude towards the benefits and barriers of cervical cancer screening were also examined. A majority of participants, 179 (74.27%), perceived cervical cancer screening as beneficial. Among these, 68 (37.99%) had been screened. In contrast, only 2 (3.23%) of those who did not perceive cervical cancer screening as beneficial had been screened. Statistical analysis showed that a positive attitude towards the benefits of cervical cancer screening was significantly associated with higher screening uptake (*p*-value <0.001). Further, analysis revealed that participants who considered cervical cancer screening beneficial were 18 times more likely to be screened than those who did not, with an OR of 18.378 (95% CI: 4.350-77-630) (table 6)

The study also evaluated attitudes towards barriers to cervical cancer screening. It was found that 32 (13.28%) participants viewed barriers as a hindrance to screening uptake.

Of these, only 1 (3.13 %) had been screened. Conversely, 69 (33.01 %) of those who did not consider barriers as hindrances had been screened. Bivariate analysis indicated that attitudes towards barriers were statistically significant in relation to screening uptake with a *p*-value of less than 0.001, (table 6)

**TABLE 6: HEALTH BELIEFS ASSOCIATED WITH UPTAKE OF CERVICAL CANCER SCREENING**

| **Variables** | **Categories** | **CCS** | | ***P*-value** | **OR (95%CI)** |
|---|---|---|---|---|---|
| | | **Screened** | **Not screened** | | |
| **CC knowledge** | Knowledgeable | 66(30.14) | 152(69.72) | 0.195 | **2.063(0.675-6.298) *** |
| | Poor knowledge | 4(17.39) | 19(82.61) | | **Ref** |
| **CCS knowledge** | Knowledgeable | 15(68.18) | 7(31.82) | **<0.001*** | **6.39 (2.477-16.483) *** |
| | Poor knowledge | 55(25.11) | 164(74.89) | | Ref |
| **Attitude(benefits)** | Favorable | 68(37.99) | 111(62.01) | **<0.001*** | **18.378 (4.350-77.630) *** |
| | Unfavorable | 2(3.23) | 60(96.77) | | Ref |
| **Attitude(barriers)** | Hinders | 1(3.13) | 31(96.88) | **0.001*** | **0.655 (0.009-0.490) *** |
| | Does not hinder | 69(33.01) | 140(66.99) | | **Ref** |
| **Self-perception** | Healthy | 44(21.89) | 157(78.11) | **<0.001*** | **0.151 (0.073-0.313) *** |
| | Unhealthy | 26(65.00) | 14(35.00) | | Ref |

The study also explored the self-perception of health status as a variable to determine its association with the uptake of cervical cancer screening. According to the findings, 201 (83.40%) of the sample, perceived themselves as healthy. Among those who viewed themselves as healthy, only 44 (21.89%) had undergone cervical cancer screening. Conversely, among those who considered themselves unhealthy, 26 (65.00%) had been screened.

The statistical analysis demonstrated that self-perception of health status was significantly associated with cervical cancer screening uptake, with a *p*-value of less than 0.001 (Table 6) This finding indicates a strong correlation between how individual perceive their health status and their likelihood of participating in cervical cancer screening.

Further analysis revealed that individuals who perceived themselves as healthy were significantly less likely to undergo cervical cancer screening compared to those who considered themselves unhealthy. The OR for this relationship was [0.151 of (95% CI: 0.073 to 0.0313) (table 6)

In a nutshell, while knowledge about cervical cancer screening alone did not significantly affect screening uptake, knowledge specifically about cervical cancer screening did. Positive attitude towards the benefits of screening were strongly associated with higher screening rates, whereas viewing barriers as significant impediments negatively impacted screening uptake. On self-perception, it suggests that individuals who view themselves as healthy are much less likely to engage in cervical cancer screening, highlighting the importance of addressing self-perception in health promotion and screening programs.

## 4.6 Health System factors associated with uptake of cervical cancer screening

### *4.6.1 Distance to the health facility:*

The proximity to the nearest health facility was analyzed to see its effect on cervical cancer screening uptake. According to this study, 121 (50.21%) participants were within three kilometers of the nearest health facility. Of these participants, only 42(34.71%) had screened for cervical cancer. In addition, 78 (32.37%) lived four to five kilometers from the nearest health facility, of which only 22 (28.21%) had screened. Also, 42 (17.43%), lived more than the recommended five kilometers from the nearest health facility of whom only 6 (14.29%) had screened (table 7). Further analysis indicated that distance was significantly associated with the uptake of cervical cancer screening (*p*-value = 0.042). Specifically, those living four to five kilometers from the nearest health facility had an OR of 0.739 (95% CI: 0.3978-1.372), suggesting they were less likely to undergo screening compared to those within three kilometers. Participants living more than five kilometers away had an even lower likelihood of screening, with an OR of 0.313 (95% CI: 0.122-0.804) (table 7)

### *4.6.2 Availability of cervical cancer screening services:*

According to this study, the majority, 112 (46.47%) were not sure if the nearest health facility did offer cervical cancer screening services. On the other hand, 73 (30.29%) said that the nearest health facility did not offer cervical cancer screening while only 56(23.24%) confirmed that indeed the nearest health facility offers cervical cancer screening. For the participants who were not sure if the nearest health facility offers cervical cancer screening services, only 24 (21.43%) had screened. For those who said

that the nearest health facility did not offer cervical cancer screening services, 23 (31.51%) had screened while 23 (41.07%) had screened for those who confirmed that the nearest health facility offers the screening services, table 7.

Availability of cervical cancer screening services significantly influenced screening uptake with a *p*-value of 0.026 (table 7). Further analysis indicated that those who confirmed the availability of services were more than twice as likely to undergo screening compared to those unsure about the availability [OR=2.556 (95% CI: 1.272-5.136)], table 7. Interestingly, those who stated that the nearest health facility did not offer cervical cancer screening were slightly more likely to screen compared to those who were not sure [ OR=1.687 (95% CI: 0.864-3.293)] (table 7)

### *4.6.3 Cost of cervical cancer screening:*

The study also explored the impact of the cost of cervical cancer screening uptake. According to this study, out of 171 (70.95%) participants who knew of a facility that offer cervical cancer screening services, 113 (66.08%) confirmed that cervical cancer screening services are not charged. However, 31 (18.13%) said that the services are charged while 27 (15.79%) were not sure if the services are charged (table 7). For those who said that cervical cancer services are free, 48 (42.48%) had been screened). Further, 10 (32.26%) of those who noted that the services are charged while only 4 (14.81%) of those who were not sure if the services are charged had been screened (table 7)

The results showed that cost played a significant role, with a *p*-value of 0.024. Participants who noted that cervical cancer screening services were not charged were five times more likely to screen compared to those who were not sure [OR = 5.231 (95% CI: 2.571-10.642)], table 7. Interestingly, also those who said that the services are charged were three times more likely to screen compared to those who were not sure [OR = 3.373 (95% CI: 1.284-8.859)], table 7.

### *4.6.4 Availability of pre-cancer treatment:*

Majority of the participants said that the nearest health facility did offer pre-cancer treatment 107 (44.40%) while 92 (38.17%) were not sure and 42 (17.43%) said the facility did not offer the services. For those who said the facility offer the services, 37(34.58%) had undergone screening. On the other hand, only 16(17.39) had been screened for those who did not know if the facility does offer pre-cancer treatment, table 7.

Further analysis indicated that availability of pre-cancer treatment services were statistically significant (*p*-value=0.006), table 7. Interestingly, those said that the nearest health facility did not offer pre-cancer treatment were the most likely to screen with more than three times likelihood of screening compared to those who were not sure [OR= 3.23 (95% CI: 1.424-7.324)], table 7. In addition, participants who knew that the nearest health facility offered pre-cancer treatment were more likely to be screened [OR=2.511 (95% CI: 1.284-4.908)], table 7.

### *4.6.5 Active medical cover:*

Lastly, participants were assessed to see if they had active medical covers and if this could significantly influence the uptake of cervical cancer screening. Unfortunately, in this study, only 52 (21.58%) of the participants had an active medical cover. Of these, 23(44.23%) had been screened for cervical cancer.

This study noted that having active medical cover was significantly associated with higher cervical cancer screening uptake, *p*-value = 0.006. Also, those with active medical cover were more than two times more likely to screen [OR= 2.396 (95% CI: 1.265-4.550)], (table 6) compared to those who didn't have a cover.

**TABLE 7: HEALTH SYSTEM FACTORS INFLUENCE ON UPTAKE OF CCS**

| Variables | Categories | CCS | | *P*-value | OR (95%CI) |
|---|---|---|---|---|---|
| | | **Screened** | **Not screened** | | |
| Distance | =<3Kms | 42 (34.71) | 79 (65.29) | **0.042*** | Ref |
| | 4-5 Kms | 22 (28.21) | 56(71.79) | | 0.739 (0.3978-1.372) |
| | >5 Km | 6 (14.29) | 36 (85.71) | | 0.313 (0.122-0.804) |
| CCS services available | Yes | 23 (41.07) | 33 (58.93) | **0.026*** | **2.556 (1.272-5.136) *** |
| | No | 23 (31.51) | 50 (68.49) | | **1.687 (0.864-3.293) *** |
| | Not sure | 24 (21.43) | 88 (78.57) | | Ref |
| CCS Charged | Yes | 10 (32.26) | 21 (67.74) | **0.024*** | **3.373 (1.284-8.859) *** |
| | No | 48 (42.48) | 65 (57.52) | | **5.231 (2.571-10.642) *** |
| | Don't know | 4(14.81) | 23 (85.19) | | Ref |
| HF offers pre-cancer treatment | Yes | 37(34.58) | 70(65.42) | **0.006*** | **2.511 (1.284-4.908) *** |
| | No | 17(40.48) | 25(59.52) | | **3.23 (1.424-7.324) *** |
| | Don't know | 16(17.39) | 76(82.61) | | Ref |
| Active medical cover | Yes | 23(44.23) | 29(55.77) | **0.006*** | **2.396 (1.265-4.550) *** |
| | No | 47(24.87) | 142(75.13) | | Ref |

Further analysis revealed that most individuals aware of another health facility offering cervical cancer screening services (82.98%) had undergone screening, compared to 63.33% of those unaware of such facilities (Figure 3). Conversely, only 44.87% of those willing to travel to another health facility for screening had been screened, while 10.81% of those unable to travel had undergone screening (Figure 3). Additionally, 44.68% of those knowledgeable about a facility offering pre-cancer treatment had been screened, whereas only 25.26% of those unaware of such facilities had undergone screening (Figure 3).

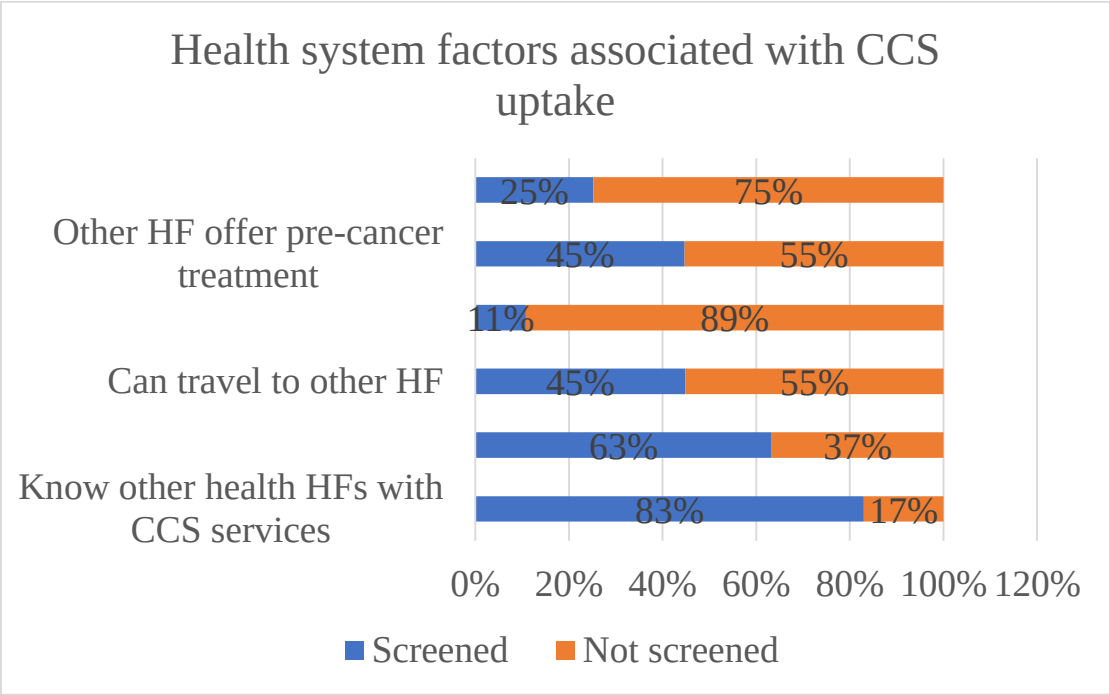


FIGURE 3: HEALTH SYSTEM FACTORS ASSOCIATED WITH CCS UPTAKE

In summary, 17.23% of the participants live more than the recommended 5 km from the nearest health facility. Further analysis revealed a significant association between distance and cervical cancer screening uptake; participants living farther away were less likely to undergo screening.

Regarding service availability, most participants were uncertain if the nearest health facility offered cervical cancer screening services. Those who confirmed availability were twice as likely to get screened compared to those who were unsure.

In terms of costs, most participants confirmed that cervical cancer screening is free. The study found that perceived cost significantly influences screening uptake, with those who believed the services were free being five times more likely to get screened compared to those uncertain about potential charges.

The availability of pre-cancer treatment also proved significant. Interestingly, the lack of pre-cancer treatment services at the nearest health facility did not deter individuals from seeking screening. These individuals were three times more likely to get screened compared to those unsure about the availability of pre-cancer treatment.

Additionally, only 21.58% of participants had active medical coverage. The study showed that having medical cover significantly influences screening uptake, with those having coverage being more than twice as likely to get screened compared to those without it.

Further assessment indicated that a majority of both those aware and unaware of another health facility offering cervical cancer screening had been screened. However, most of those unwilling to travel to another facility had not undergone screening. Finally, screening rates were low regardless of whether participants knew of another health facility offering pre-cancer treatment or not.

# CHAPTER FIVE: DISCUSSION, CONCLUSIONS, AND RECOMMENDATIONS

## 5.1 Introduction:

This chapter critically discusses the study's findings in the context of existing literature, highlighting areas of agreement and divergence with previous research. It further synthesizes the insights gained to draw meaningful conclusions and provides practical recommendations aimed at enhancing the uptake of CCS in Laikipia County. The recommendations focus on addressing identified barriers, leveraging opportunities, and informing policy and programmatic interventions.

## 5.2 Discussion

### *5.2.1 Social demographic characteristics of the study participants*

The demographic profile of the respondents reveals that the majority were women aged between 35–49 years (39.42%) and 50–59 years (34.85%), indicating that middle-aged women were the most represented age groups in the study. In contrast, younger women aged 18–24 years constituted the smallest proportion, suggesting lower participation or representation of this age group in matters related to CCS, potentially due to limited awareness or perceived irrelevance of the service at their age.

A significant majority of the respondents were married (76.35%), which may reflect the demographic structure of the community or indicate that marital status is associated with greater participation in health-related studies or access to health services. In terms of education, most participants had attained secondary education (43.15%), implying a moderate level of literacy that could influence their understanding of cervical cancer screening (CCS) and related health information.

Socioeconomic data further highlight potential barriers to CCS uptake. A large proportion of respondents were unemployed (74.27%) and the vast majority (84.65%) earned less than Kshs. 5,000 per month. These findings point to widespread economic vulnerability among the study population, which may affect access to healthcare services, including CCS, due to associated direct and indirect costs.

### *5.2.2 The level of uptake of cervical cancer screening*

The findings of this study indicate that the uptake of cervical cancer screening was 70 (29.1%). This finding is relatively similar to those studies done in LMIC. For example,

25.6% in Kenya(Gatumo et al., 2018); 21% in Tanzania(Kileo et al., 2015), and 26.5% in Malawi(Msyamboza et al., 2016). However, the study reported relatively high uptake compared to other studies still done in the LMIC such as 5.4% in Ethiopia(Aynalem et al., 2020), and 3% in Ghana(Ampofo et al., 2020) The possible explanation for this relatively higher uptake is that fact that there were several outreaches that had been conducted in areas where data collections were done as it was reported during the data collection. Despite the outreaches, the uptake was still very low according to the recommended 70% uptake by WHO(World Health Organization, 2021). This is mainly attributed to poor knowledge on cervical cancer screening, perceived barriers and self-perception on health status as discussed further. Also, low investment has been done on cervical cancer treatment infrastructure hence the community fear knowing their health status yet there are no treatment services.

### *5.2.3 Individual characteristic influencing the uptake of cervical cancer screening*

According to this study, age was significantly associated with the uptake where women aged between 35-49 years had the highest likelihood of screening. According to KII, Older women are more likely to screen compared to the younger women. This is attributed to priorities and perception where younger women perceive to be healthy and are also not ready to learn about their health status fearing that the test may be positive yet they are still young and want to focus no raising their children. A health care worker stated, "*They fear that the test can be positive. If it turns positive, this will require a lot of finance to treat. They would rather not know their status because if they know, this will stress them and die while they are still young.* Another KII stated that "*The younger women perceive themselves as healthy. On the other hand, the older women are more concern with their health hence regular health check-up including CCS.* This is in consistent with studies done in Ethiopia(Aynalem et al., 2020), Tanzania(Cunningham et al., 2015), and United States(Akinlotan et al., 2017). In addition, employment status was also significantly associated with the uptake with those who were employed having more likelihood compared to those who were not employed. This is similar to other studies done by Ama G. Ampofo et al(Ampofo et al., 2020), and Aynalem et al(Aynalem et al., 2020).

Finally, this study revealed that the level of income also influences the uptake of cervical cancer screening. Those earning more than Kshs. 5000 per month were more likely to screen compared to those earning less than Kshs 5000. This is similar to other

studies(Nganga et al., 2018). Also, in KII, it was evidencing the people perceive cervical cancer treatment as very expensive to treat. Since majority understand CCS as diagnostic, they do not want to know if they could be having cancer because they cannot afford to treat it.

### *5.2.4 Health beliefs effecting the uptake of cervical cancer screening services*

The study found that significant proportion of participants, 218 individuals (90.46%) were knowledgeable about cervical cancer. Despite this high knowledge, only 66 participants (30.14%) from this group had undergone screening. Conversely, among the 23 participants (9.54%) who were not knowledgeable about cervical cancer, only 4 (17.39%) had been screened. Bivariate analysis revealed that the level of knowledge about cervical cancer screening was not significantly associated with the uptake of cervical cancer screening (*p*-value = 0.195).

Previous studies have shown that while general knowledge about cervical cancer can increase awareness, it is the specific understanding of cervical cancer screening procedures and their importance that more strongly influences screening behaviors. For instance, Ampofo et al(Ampofo et al., 2020), Gatumo et al(Gatumo et al., 2018), and Lim et al(Lim et al., 2016) found that women who were well informed about the benefits and procedures of cervical cancer screening were significantly more likely to participate in regular screening. This study's findings that knowledge specifically about cervical cancer screening, rather than general knowledge about cervical cancer, was significantly associated with screening uptake aligns with results(Cunningham et al., 2015)·(Akinlotan et al., 2017). The present study showed that individuals knowledgeable about cervical cancer screening were six times more likely to undergo screening, with an OR of 6.39 (95% CI: 2.477-16.483), reinforcing the critical role of specific knowledge in promoting preventive health behaviours.

Attitude towards the benefits and barriers of cervical cancer screening were also examined. A majority of the participants, 179 (74.27%), perceived cervical cancer screening as beneficial. Among these, 68 (37.99%) had been screened, whereas only 2 (3.23%) of those who did not perceive cervical cancer screening as beneficial had been screened. Statistical analysis showed that a positive attitude towards the benefits of cervical cancer screening was significantly associated with higher screening uptake (*p*-value <0.001) Further analysis revealed that participants who considered cervical

cancer screening beneficial were 18 times more likely to be screened than those who did not [OR= 18.378 (95% CI: 4.350- 77.630)].

The impact of attitudes on screening behavior has been well documented in the literature. The positive attitudes towards the benefits of cervical cancers screening have been associated with higher screening rates in numerous studies(Ampofo et al., 2020) . For example, Ampofo et al(Ampofo et al., 2020) demonstrated that women who perceived cervical cancer screening as highly beneficial were significantly more likely to undergo screening. This aligns with the present study's finding that participants who viewed cervical cancer screening as beneficial were 18 times more likely to be screened than those who did not, underscoring the importance of fostering positive attitudes towards screening in public health interventions.

The study also evaluated the attitudes towards barriers to cervical cancer screening. It was found that 32 (13.28%) participants viewed barriers as a hinderance to screening uptake. Of these, only 1 (3.13%) had been screened. Conversely, 69 (33.01%) of those who did not consider barriers as hinderances had been screened. Bivariate analysis indicated that attitudes towards barriers were statistically significant in relation to screening uptake, with a *p*-value of less than 0.001.

Similar to the findings of this study, other research has shown that perceived barriers can significantly hinder screening uptake(Ampofo et al., 2020). highlighted that perceived barrier, such as fear of the procedure and concern about costs, were significant predictors of lower screening rates among women. The present study collaborates this by showing that only 3.13% of the participants who viewed barriers as hinderance had been screened, compared to 69 (33.01%) of those who did not perceive barriers as hinderance. This significant disparity underscores the need for strategies that address and mitigate these barriers to improve screening rates.

The study also explored the self-perception of health status as a variable to determine its association with the uptake of cervical cancer screening. According to the findings, 201 (83.40%) participants perceived themselves as healthy. Among those who perceived themselves as healthy, only 44 (21.89%) had undergone cervical cancer screening. Conversely, among those who considered themselves unhealthy, 26 (65.00%) had been screened. The statistical analysis demonstrated that self-perception of health status was significantly associated with cervical cancer screening uptake, with

a *p*-value of less than 0.001. These findings indicate a strong correlation between how individual perceive their health status and their likelihood of participating in cervical cancer screening.

Further analysis revealed that individuals who perceived themselves as healthy were significantly less likely to undergo cervical cancer screening compared to those who considered themselves unhealthy [OR = 0.0151 (95% CI: 0.073-0.313)], table 5. This significant association suggests that health perception influences preventive health behaviour and should be addressed in health promotion programs.

Studies have shown that individuals who perceive themselves as healthy are less likely to engage in preventive health behaviours, including cancer screening. Vernon et al. (2011) indicated that women who perceived themselves as being in good health were less likely to participate in cervical cancer screening compared to those who perceive their health as less optimal. This study similarly found that participants who considered themselves healthy were significantly less likely to undergo cervical cancer screening, highlighting the importance of addressing self-perception in health promotion and screening programs.

### *5.2.5 Health System Factors influencing the uptake of cervical cancer screening services*

The study examined how the proximity to the nearest health facility influences the uptake of cervical cancer screening services. The results indicated a clear trend where the distance to the nearest health facility played a significant role in the screening rates. Specifically, participants who lived closer to health facilities were more likely to undergo screening than those who lived farther away(Ampofo et al., 2020), (Kileo et al., 2015).

Among the participants, 121 (50.21%) lived within three kilometers of a health facility, yet only 42 (34.71%) of them had been screened for cervical cancer. For those residing four to five kilometers away, 78 (32.37%) in total, only 22 (28.21%) had undergone screening. The screening rates dropped further for those living more than five kilometers away; out of 42 participants, only 6 (14.29%) had been screened.

Statistics analysis showed that distance was significantly associated with the uptake of cervical cancer with a *p*-value of 0.042. Participants living four or five kilometers were less likely to get screening compared to those within three kilometers, with an OR (95%

CI: 0.3978-1.372) (table 6) The likelihood of screening decreased even further for those living more the five kilometers away, with an OR of 0.313 (95% CI: 0.122-0.804) (table 6)

The findings are consistence with previous research, which has also identified distance to the facility as a critical barrier to accessing health services, including cervical cancer screening. Studies from various settings have shown that greater distances to health facilities often lead to lower utilization rates of preventive health services (Lim et al., 2016). This is particularly true in low-resources settings where transportation can be a significant barrier due to cost, availability, and time constraints(Lim et al., 2016).

Past studies have highlighted that the physical accessibility of health services is a crucial factor in healthcare utilization. For instance, research has found that women living in rural or remote areas with limited access to health facilities are less likely to participate in regular screening programs compared to those in urban areas with better healthcare infrastructure(Cunningham et al., 2015). This disparity is often exacerbated by other factors such as lack of transportation, poor road condition, and financial constraints(Lim et al., 2016).

The current study's findings underscore the importance of addressing geographical barriers to improve cervical cancer screening rates. Strategies such as mobile health clinics, outreaches programs, and community health workers can be effective in bridging the gap for those living farther from health facilities. By bringing services closer to the population and reducing the physical distance to the healthcare services, these interventions can significantly enhance screening uptake and early detection of cervical cancer(Kileo et al., 2015).

In summary, the study highlights that proximity to health facilities is a significant determinant of cervical cancer screening uptake. Efforts to improve accessibility and reduce geographical barriers are crucial for increasing participation in screening programs and ultimately improving health outcomes.

The study highlights the significant impact of cost on the uptake of cervical cancer screening services. Participants who perceived the services as free were substantially more likely to screen compared to those who were unsure or thought the services were charged. This aligns with previous research, which consistently shows that financial barriers are a major deterrent to preventive health services(Lim et al., 2016).

In comparison to past studies, similar trends have been observed. Research conducted in various regions has consistently indicated that participation rates are significantly higher when cervical cancer screening services are offered at no cost or a minimal charge. For instance, studies in LMIC settings have shown that subsidized or free screening programs result in greater attendance and compliance, leading to earlier detection and better health outcomes(Akinlotan et al., 2017).

Moreover, past studies have also indicated that uncertainty regarding the cost of medical services act as a psychological barrier, deterring individuals from seeking care when they might be financially able to afford it. This uncertainty creates a sense of risk and potential financial burden that individuals are often unwilling to take, especially in economically disadvantaged populations.

Furthermore, the findings from this study resonate with broader health behavior theories, which suggest that perceived barriers (such as cost) are a critical component in the decision-making process for health service utilization. When these barriers are minimized or removed, the likelihood of engaging in preventive health behaviors, such as cancer screening, increases markedly(Gatumo et al., 2018),(Kileo et al., 2015).

Overall, the study adds to the body of evidence that reducing financial barriers and providing clear information about the cost associated with health services are essential strategies for increasing the uptake of cervical cancer screening. By ensuring that people are aware of the affordability or availability of free services, public health initiatives can significantly improve screening rates and early detection, ultimately leading to better health outcomes and reduced mortality from cervical cancer.

The study's findings further highlight the importance of awareness and availability of pre-cancer treatment services in influencing the uptake of cervical cancer screening. Participants who were certain that their nearest health facility provided these services were more likely to undergo screening. This reflects a broader trend observed in previous research, where the knowledge of accessible healthcare services tends to encourage preventive health behaviors.

Interestingly, those who believed that their nearest health facility did not offer pre-cancer treatment were significantly more likely to be screened compared to those who were unsure about the availability of such services. This suggests that clarity, even if negative, may prompt individuals to seek screening elsewhere, demonstrating a

proactive approach to health. This phenomenon aligns with health behavior theories emphasizing the importance of perceived availability and accessibility of services in motivating individuals to take preventive health measures.

The statistical significance of these findings reinforces the critical role that clear and accurate information about health services plays in encouraging screening. When individuals are aware that pre-cancer treatment is available, they are more likely to participate in screening programs. Conversely, uncertainty about the availability of these services acts as a deterrent (Gatumo et al., 2018)&(Ba-break et al., 2015).

Past research supports these conclusions, consistently showing that awareness and accessibility are key factors in healthcare utilization. Studies have found that when comprehensive cancer care services are well-publicized and perceived as accessible, screening rates increase. This highlights the need for effective communication strategies to ensure that communities are informed about the health services available to them(Gatumo et al., 2018),(Glanz et al., 2002)&(Black et al., 2019).

In summary, the study underscores the importance of promoting awareness about the availability of pre-cancer treatment services to increase the uptake of cervical cancer screening. Clear and accessible information can significantly enhance participation in preventive health programs, ultimately leading to better health outcomes and more effective early intervention.

The study's findings underscore the critical role that active medical cover plays in the uptake of cervical cancer screening. Participants with medical insurance were significantly more likely to participate in screening programs compared to those without coverage. This observation is in line with a substantial body of research that highlights the positive impact of health insurance on accessing preventive health services(Marques et al., 2020), (R. Penchasky & J Thomas, 1981),(Nakisige et al., 2017).

Health insurance reduces financial barriers to healthcare, making it more feasible for individuals to afford preventive screening and other necessary medical services. Without the burden of out-of-pocket expenses, insured individuals are more inclined to undergo routine health checks and screenings. This financial support is particularly important in encouraging people to engage in preventive measures that they might

otherwise forgo due to cost concerns(Marques et al., 2020),(R. Penchasky & J Thomas, 1981).

Moreover, having health insurance often means more regular and proactive interactions with healthcare providers(Chidyaonga-Maseko et al., 2015). These interactions can lead increased awareness about the importance of preventive health measures, such as cervical cancer screening(Chidyaonga-Maseko et al., 2015),(Pittalis et al., 2020). Health care providers can play a pivotal role in educating patients about the benefits of screening and in encouraging them to adhere to recommended screening schedules. This continuous engagement with the healthcare system creates opportunity to recommend and remind about necessary preventive screening(Chidyaonga-Maseko et al., 2015).

Additionally, insurance coverage can improve access to a broader range of healthcare services. Insured individuals typically have access to a network of healthcare providers, including specialists who can offer comprehensive care(Marques et al., 2020). This network can include facilities that provide screening and follow-up services, which are crucial for early detection and treatment of cervical cancer(R. Penchasky & J Thomas, 1981). Enhanced access to such services ensures that patients receive timely and appropriate care, further improving health outcomes.

Previous studies support these findings, consistently showing that individuals with health insurance have higher rates of participation in preventive health programs. For example, research in various settings has demonstrated that insured women are more likely to receive mammograms, Pap tests, and other screening compared to their uninsured counterparts(Chidyaonga-Maseko et al., 2015),(Nakisige et al., 2017). This increased screening uptake is associated with earlier detection of diseases, including cervical cancer, which can significantly improve prognosis and reduce mortality rates.

In summary, the study highlights the substantial influence of active medical cover on the uptake of cervical cancer screening. Health insurance not only alleviates financial barriers but also fosters a more engaged and informed approach to healthcare. Ensuring that more individuals have access to health insurance could significantly enhance screening rates, promote early detection, and ultimately improve health outcomes. This underscores the importance of policies aimed at expanding health insurance coverage

as a means to enhance public health and reduce the burden of cervical cancer and other preventable diseases.

## 5.3 Conclusion

Cervical cancer remains a significant public health issue, especially in LMIC where screening programs are often limited. This study aimed to explore factors influencing cervical cancer screening uptake, focusing on individual characteristics, health beliefs, and health system factors.

The demographic and socioeconomic characteristics of the respondents indicate that CCS uptake efforts in Laikipia County must account for the dominance of middle-aged, married, and economically disadvantaged women with moderate education levels. The low representation of younger women and the high levels of unemployment and low income suggest potential barriers to access and awareness. Therefore, any strategies aimed at improving CCS uptake should prioritize targeted awareness campaigns, youth engagement, and the removal of financial and logistical barriers to screening services.

The study found a screening rate of 29.1% which aligns with similar rates in other LMIC but is still below the WHO's recommended 70% uptake. Despite outreaches efforts, low screening rates were attributed to poor knowledge, perceived barriers, and limited treatment infrastructure.

Age, employment status, and income level were significantly associated with screening uptake. Women aged 35-49 years, employed individuals, and those with higher incomes were more likely to undergo screening. These findings are consistent with other studies, indicating that socio-economic factors play a crucial role in health-seeking behaviors.

*Knowledge about cervical cancer screening*: High general knowledge did not necessarily translate to high screening rates. Specific knowledge procedures and benefits were more influential, aligning with previous research that emphasizes the importance of targeted health education.

*Attitudes towards benefits and barriers*: Positive attitudes towards benefits of cervical cancer screening were significantly associated with higher uptake, consistent with past studies showing that perceived benefits motivated preventive health behaviors. Conversely, perceived barriers significantly hindered screening uptake, highlighting the need to address these obstacles in health promotion efforts.

*Self-perception of health status:* Participants who perceived themselves as healthy were less likely to undergo screening compared to those who viewed their health status as less optimal. This finding aligns with other studies suggesting that self-perception influences preventive health behaviours.

*Distance to health facilities:* Proximity to health facilities significantly influenced screening uptake. Those living closer to health facilities were more likely to be screened, consistent with research showing that geographical barriers can deter access to healthcare services.

*Costs:* Perceived cost of services was a significant barrier to screening. Participants who believed services were free were more likely to screen, echoing findings from other studies that financial barriers impede access to preventive health services.

*Pre-cancer treatment availability:* Awareness of available pre-cancer treatment services increased screening uptake. Clear information about services availability was crucial in encouraging participation in screening programs, supporting the idea that awareness and accessibility are key determinants of healthcare utilization.

*Active medical cover:* Participants with active medical cover were significantly more likely to undergo screening. This aligns with a large body of research indicating that health insurance reduces financial barriers and fosters proactive health behaviors. Expanding health insurance coverage could significantly enhance screening rates and improve health outcomes.

In a nutshell, the study emphasizes the importance of addressing various individual and systemic factors to improve cervical cancer screening uptake. Targeted health education, reducing perceived barriers, improving accessibility, and expanding health insurance coverage are crucial strategies to enhance participation in screening programs. These efforts can lead to earlier detection, better health outcomes, and a reduction in the burden of cervical cancer in LMIC.

## 5.4 Recommendations

### *5.4.1 Programmatic recommendations from the study*

*Ministry of Health (MoH) and County Health Departments:*

Launch targeted public sensitization campaigns focusing on younger women of reproductive age, especially those under 34 years, to raise awareness and promote early screening.

*MoH, health insurance, and Policy Makers:*

Lobby for the inclusion of cervical cancer screening and treatment services in national and private medical insurance packages.

Facilitate partnerships with NGOs and development partners to subsidize screening and treatment costs.

*MoH Health Promotion Units and Health Educators:*

Develop and disseminate key health messages emphasizing that cervical cancer screening is a preventive—not diagnostic—service.

Integrate this message into all health promotion materials and community outreach programs.

*MoH and County Governments*:

Increase the availability and accessibility of cervical cancer screening and treatment services in all health facilities, including lower-level centers.

Ensure health facilities are adequately staffed and equipped to provide consistent and quality screening services

### *5.4.2 Recommendations for further research*

Further research is recommended to evaluate the effectiveness of strategies promoting the adoption of preventive health services, with a particular focus on cervical cancer screening.

Moreover, it is crucial to examine whether communities have sufficient access to quality cervical cancer screening and treatment services.

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# APPENDICES

## Appendix I: Informed consent for the participants

Thank you for agreeing to talk to me.

My name is Lily Njoroge, I am a Kenyatta University student and I am conducting a survey on cervical cancer screening among women aged 18 to 59 years.

**Procedures to be followed:**

This discussion intends to evaluate community knowledge on Cervical cancer, and cervical cancer screening and individuals' perception of ability to receive screening services.

**Voluntarism:**

It is voluntary to participate, and it is not a must to answer any question you are not ready to answer.

**Benefits:**

The information collected will be used for studies and to draw recommendations to the county health department.

**Reward:**

There may be no direct reward if you agree to participate in the study, however, the research findings will help in making informed decisions which in turn will improve women's health status

**Confidentiality:**

The details of our conversation will be kept confidential, and you will not be associated with any information given.

**Contact Information:**

Should you have any concerns about your rights as a research volunteer, you may contact the chief officer of health, at Laikipia County.

**Participant's agreement:**

Do you agree to continue in this discussion?

| | |
|---|---|
| **Yes** | |
| **No** | |

Appendix II: Questionnaire

**SURVEY TOOL FOR WOMEN AGED 18-59 YEARS FOR LAIKIPIA COUNTY**

| |
|---|
| Name of interviewer:……. Designation…….. |
| Signature…….. Date…….. |
| Questionnaire Serial Number…… |

**CONSENT**

Thank you for agreeing to talk to me.

My name is, I am a Kenyatta University student and I am conducting a survey on cervical cancer screening among women aged 18 to 59 years. This discussion intends to evaluate community knowledge on Cervical cancer, and cervical cancer screening and individuals' perception of ability to receive screening services. It is voluntary to participate, and it is not a must to answer any question you are not ready to answer.

The information collected will be used for studies and to draw recommendations to the county health department.

There may be no direct reward if you agree to participate in the study, however, the research findings will help in making informed decisions which in turn will improve women's health status.

The details of our conversation will be kept confidential, and you will not be associated with any information given.

Should you have any concerns about your rights as a research volunteer, you may contact the chief officer of health, at Laikipia County.

The discussion should take around 15 minutes.

Do you agree to continue in this discussion?

| | |
|---|---|
| **Yes** | |
| **No** | |

**Interviewer guide:**

***Mark (✓) in the box (□) for answer(s) given.***

Interviewer should not read the response availed unless directed to read.

| **S. No** | **Questions and Filters** | **Coding Categories** | **SKIP** |
|---|---|---|---|
| | | **1.0 Demographic Information** | |
| **1.1** | What is your age? | ……. **(Only Women aged 18-59 years)** | |
| **1.2** | What is your marital status? | □ Single/Never married……..1<br>□ Married/Living with partner……2<br>□ Divorced/separated…….…….3<br>□Widowed……..……4<br>□ Prefer not to say……..……5 | |

| | | | |
|---|---|---|---|
| **1.3** | What is the highest level of education obtained? | □ No formal education……1<br>□Primary school……...2<br>□Secondary school……...3<br>□Tertiary education……..4<br>□Prefer not to say……..…5<br>□Other (specify)……<br>……...98 | |
| **1.4** | Are you currently | □ Employed full time……..…1<br>□ Employed part time……..…2<br>□ Unemployed…….3<br>□ Self-employed……..4<br>□ Still studying……5<br>□ Prefer not to say……...……6<br>□ Other (specify)……..<br>…….98 | **(If not employed, skip to 1.6)** |
| **1.5** | Monthly Income (Kenyan Shillings) | □Less than 5,000……1<br>□ 5,000-10,000……2<br>□10,001-15,000……...3<br>□15,001- 20,000…….4<br>□20,001-30,000…….…5<br>□30,001-40,000……..6<br>□40,000-50,000……7<br>□50,001-100,000……8<br>□More than 100,000……..9 | |
| **1.6** | Religion | □ Christian Protestant…...……..1<br>□ Christian Catholic……...2<br>□ Muslim……3<br>□ Others (Specify)……..<br>……98 | |
| **1.7** | What is the name of your nearest health facility? | | |
| **1.8** | What type of health facility is the hospital? | □ Public……...1<br>□ Private……..2<br>□ Faith Based…….3<br>□ Others (specify)…….98 | |
| **1.9** | What is the Level of the health facility? | □ Dispensary ……1<br>□ Health Center……..2<br>□ Subcounty Hospital……....3<br>□ County Hospital……...…..4<br>□ Medical Clinic……...…5<br>□ Others (Specify)……...…..98 | |
| **1.10** | What is the distance to the Health Facility (Kilometers) | □Less than 1 Km……...……1<br>□1-3 Kms……..……2<br>□4-5 Kms……..……3<br>□6-10 Kms……...…….4<br>□More than 10 Kms…….5 | |

| | | | |
|---|---|---|---|
| **1.11** | What is the means of transport from home to the health facility? | □ Walking……..……..1<br>□ Cycling…….2<br>□ Motorbike……..……..3<br>□ Public Vehicle……..……4<br>□ Private Vehicle…….……..5<br>□ Taxi……..…….6<br>□ Others (Specify)……..<br>……98 | |
| **1.12** | What type of the road do you use from home to the health facility? | □ Murram…….……..1<br>□ All-weather road……2<br>□ Others (Specify)…….<br>……...98 | |
| **1.13** | In the last 3 years, have you received any family planning services in a health facility | □ Yes……..……1<br>□ No...……..……...…0 | |

**2.0 KNOWLEDGE** ***(Causes, signs and prevention methods)***

| **NO.** | **QUESTIONS AND FILTERS** | **CODING CATEGORIES** | **SKIP** |
|---|---|---|---|
| **2.1** | Have you ever heard about Cervical Cancer? | □ Yes……..……1<br>□ No...……..……...…0 | **If No, Skip to the END** |
| **Indicate whether it is true or false** | | | |
| **2.1.1** | Cervical cancer is preventable | □ True……1<br>□ False……2<br>□ Don't know…….3 | |
| **2.1.2** | Having many sexual partners is a risk factor for cervical cancer | □ True……1<br>□ False……2<br>□ Don't know…….3 | |
| **2.1.3** | Oral contraceptive is a risk factor for cervical cancer | □ True……1<br>□ False……2<br>□ Don't know…….3 | |
| **2.1.4** | Smoking increases chances of having cervical cancer | □ True……1<br>□ False……2<br>□ Don't know…….3 | |
| **2.1.5** | Those who have weak immune system (e.g. HTN, DM and HIV) are more likely to have cervical cancer | □ True……1<br>□ False……2<br>□ Don't know…….3 | |
| **2.1.6** | You are more likely to get cervical cancer if your family has it | □ True……1<br>□ False……2<br>□ Don't know…….3 | |

| | | | |
|---|---|---|---|
| **2.1.7** | Having many babies is a risk factor for cervical cancer | □ True……1<br>□ False……2<br>□ Don't know……3 | |
| **2.1.8** | Human papilloma virus (HPV) is a risk factor for cervical cancer. | □ True……1<br>□ False……2<br>□ Don't know……3 | |
| **2.2** | Have you heard about Cervical Cancer Screening | □ Yes……..……1<br>□ No...……..……...…0 | **If No, Skip to the END** |
| **2.2.1** | Which methods are used to screen for cervical cancer? | □ VIA VILI…….….1<br>□Pap smear…….……..2<br>□HPV test…….……3<br>□Don't know……..……..4 | |
| **2.2.2** | Who are eligible for cervical cancer screening | □ Women aged 25 to 49 years……..1<br>□Women who are sexually active…….2<br>□Women above 18 years……..3<br>□ Women above 50 years…….4<br>□ Don't know……...5 | |
| **2.2.3** | How often should cervical cancer screening be done | □ Every year……1<br>□Every 2 years…….2<br>□Every 3 years……..3<br>□Every 5 years…….4<br>□Don't know……5 | |

**3.0 ATTITUDE:** ***(Perceived benefits and perceived barriers)***

***3.1 Perceived Benefits***

| | | **Strongly Disagree** | **Disagree** | **Neutral** | **Agree** | **Strongly Agree** |
|---|---|---|---|---|---|---|
| **3.1.1** | If I get screened for cervical cancer and nothing is found, I don't need to worry as much about cervical cancer | | | | | |
| **3.1.2** | Having cervical cancer screening will help in early diagnoses and treatment | | | | | |
| **3.1.3** | Having cervical cancer screening will decrease my chances of dyeing from cervical cancer | | | | | |

***3.2 Perceived Barriers***

| | | **Strongly Disagree** | **Disagree** | **Neutral** | **Agree** | **Strongly Agree** |
|---|---|---|---|---|---|---|
| **3.2.1** | I am afraid to have cervical cancer screening because I might find out something is wrong | | | | | |
| **3.2.2** | Having cervical cancer screening is too embarrassing | | | | | |
| **3.2.3** | Having cervical cancer screening is too painful | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| **3.2.4** | Having cervical cancer screening takes too much time | | | | | |
| **3.2.5** | I have other problems more important than getting cervical cancer screening | | | | | |
| **3.2.6** | I cannot afford to get cervical cancer screening | | | | | |

**4.0 HEALTHCARE SYSTEM FACTORS (*Availability, accessibility and affordability)***

| NO. | QUESTIONS AND FILTERS | CODING CATEGORIES | SKIP |
|---|---|---|---|
| **4.1** | Have you ever been screened for cervical cancer? | □ Yes……..……1<br>□ No...……..…...…0 | **If No, Skip to 4.3** |
| **4.1.1** | When was the last time you screened? | □Within 3 years…….1<br>□3 to 5 years……..2<br>□More than 5 years……3<br>□Cannot remember……4 | |
| **4.2** | Does the facility you mentioned above offer cervical cancer screening services? | □ Yes……..……1<br>□ No...……..…...…0<br>□ Not sure……...2 | **If Yes, Skip to 4.5** |
| **4.3** | Do you know of another health facility offering cervical cancer screening? | □ Yes……..……1<br>□ No...……..……0 | **If No, Skip to 4.6** |
| **4.3.1** | What is the name of health facility? | …….. | |
| **4.4** | Can you travel to the health facility to get cervical cancer screening services? | □ Yes……..……1<br>□ No...……..…...…0 | **If Yes, Skip to 4.5** |
| **4.4.1** | What would prevent you from traveling to the other health facility? | □ Distance to the facility……1<br>□ Costs of traveling to the facility..2<br>□ Costs of screening……..…..3<br>□ Waiting time……..…..4<br>□ Others (Specify)…… …….98 | |
| **4.5** | Does the facility charge for cervical cancer screening | □ Yes……..……1<br>□ No...……..……...…2<br>□ Don't Know……..…3 | **If Don't Know, Skip to 4.6** |
| **4.5.1** | How much are the charges (Kshs) | □No charges……...…1<br>□500 or Less……...…2<br>□501-1000…….……...…..3<br>□1001-2000……4<br>□More than 2000……..…..5<br>□Don't know…….……...99 | |
| **4.6** | Do you have an active medical insurance cover | □ Yes……..……1<br>□ No...……..……...…0 | **If No, Skip to 4.7** |

| | | | |
|---|---|---|---|
| **4.6.1** | Which type of medical cover | □National insurance cover (NHIF).1<br>□Private insurance cover……2 | |
| **4.7** | Does the facility you mentioned above offer cervical pre-cancer treatment services? | □ Yes……..……1<br>□ No...……..……...…0<br>□ Not sure……..…….2 | **If Yes, Skip to 5.0** |
| **4.8** | Do you know of another health facility offering cervical pre-cancer treatment services? | □ Yes……..……1<br>□ No...……..……...…0 | |
| **4.8.1** | What is the name of health facility? | …….. | |

**5.0 NEEDS FACTORS *(Self-Perceived health status)***

| | | **No** | **Slightly** | **Moderately** | **Severely** | **Extremely** |
|---|---|---|---|---|---|---|
| **5.1** | I feel pain in my body | | | | | |
| **5.2** | I feel discomfort in my body | | | | | |
| **5.3** | I feel anxious about having cancer | | | | | |

**6.0 GENERAL INFORMATION ON HEALTH**

| NO. | QUESTION AND FILTERS | CODING CATEGORIES | SKIP |
|---|---|---|---|
| **6.1** | In your opinion, what action can be taken by the county in order to increase cervical cancer screening uptake? | 1. ……..<br>2. ……..<br>3. …….. | |
| **6.2** | In your opinion, what has been achieved by the county in regard to cervical cancer services? | 1. ……<br>2. ……<br>3. …… | |

**END**

***Thank you very much for participating in our survey.***

Appendix III: Key informant interview guide:

# CERVICAL CANCER SCREENING UPTAKE TOOL:
## Key Informant Interview Guide

| | | | |
|---|---|---|---|
| Site | | Name of Interviewee | |
| Date | | Position of Interviewee | |
| Community Unit | | Duration in the Position | |
| Village | | Interviewer | |

**Introduction**

Thank you for agreeing to talk to me.

My name, I am a Kenyatta University student and I am conducting a survey on cervical cancer screening among women aged 18 to 59 years. This discussion intends to evaluate community knowledge on Cervical cancer, and cervical cancer screening and individuals' perception of ability to receive screening services. It is voluntary to participate, and it is not a must to answer any question you are not ready to answer.

The information collected will be used for studies and to draw recommendations to the county health department.

There may be no direct reward if you agree to participate in the study, however, the research findings will help in making informed decisions which in turn will improve women's health status.

The details of our conversation will be kept confidential, and you will not be associated with any information given.

Should you have any concerns about your rights as a research volunteer, you may contact the chief officer of health, at Laikipia County.

The discussion will take less than 30 minutes.

Do you agree to continue in this discussion?

| | |
|---|---|
| **Yes** | |
| **No** | |

**HEALTH BELIEFS (Knowledge and attitude)**

1. What is cervical cancer?

   ***(Probe more on causes, signs, and prevention methods)***

2. What are the benefits of cervical cancer screening?
3. What are the barriers to cervical cancer screening?

   ***(Probe more on availability, accessibility, and affordability)***

**PERCEIVED HEALTH STATUS**

4. In your opinion, when do women go for cervical cancer screening
5. In your opinion, if cervical cancer screening services are available and free of charge, do you think more women will be willing to go for screening? Why?

**GENERAL INFORMATION ON HEALTH**

6. What action can be taken by the county in order to increase cervical cancer screening uptake?
7. What has been achieved by the county in regard to cervical cancer services?

Appendix IV: KU-ERC Approval

KENYATTA UNIVERSITY
ETHICS REVIEW COMMITTEE

Fax: 8711242/8711575
Email: kuerc.chairman@ku.ac.ke

P. O. Box 43844,
Nairobi, 00100
Tel: 8710901/12

Website: www.ku.ac.ke

Our Ref: **KU/ERC/ COND. APPROVAL/VOL.1** Date: 11th April, 2024

Lily Njoroge
P.O Box 43844, 00100
Nairobi.

Dear Lily,

**APPLICATION NUMBER: PKU/2907/I12030- Uptake of Cervical Cancer screening among women aged 18to 59 years in Laikipia County, Kenya**

1. **IDENTIFICATION OF PROTOCOL**

The application before the committee is with a research topic **"Uptake of Cervical Cancer screening among women aged 18to 59 years in Laikipia County, Kenya )"**. Received on March 2024.

2. **APPLICANT**

Lily Njoroge

3. **SITE**

**Laikipia County, Kenya**

4. **DECISION**

The committee has considered the research protocol in accordance with the Kenyatta University Research Policy (section 7.2.1.3) and the Kenyatta University Ethics Review Committee Guidelines and **APPROVED that the research may proceed ON CONDITION that you incorporate its advice as below**

Appendix V: Post graduate approval, Kenyatta Universit

**KENYATTA UNIVERSITY**
**CENTRE FOR RESEARCH ETHICS AND SAFETY**

**Fax: 8711242/8711575**
**Email: chairman.kuerc@ku.ac.ke**
**Nairobi, 00100**

**P. O. Box 43844,**

Tel: 8710901/12

Website: www.ku.ac.ke
Our Ref: **KU/ERC/APPROVAL/VOL.1**

Date: 16th April, 2024

Lily Njoroge
P.O Box 43844, 00100
Nairobi.

Dear Lily,

**APPLICATION NUMBER: PKU/2907/I12030: "UPTAKE OF CERVICAL CANCER SCREENING AMONG WOMEN AGED 18 TO 59 YEARS IN LAIKIPIA COUNTY, KENYA."**

This is to inform you that ***KENYATTA UNIVERSITY ETHICS REVIEW COMMITTEE*** has reviewed and approved your above research proposal. Your application approval number is **PKU/2907/I12030.** The approval period is **16th/4/2024 *to* 16th/4/2025.**

This approval is subject to compliance with the following requirements;

i. Only approved documents including (informed consents, study instruments, MTA) will be used
ii. All changes including (amendments, deviations, and violations) are submitted for review and approval by ***KENYATTA UNIVERSITY ETHICS REVIEW COMMITTEE***
iii. Death and life threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to ***KENYATTA UNIVERSITY ETHICS REVIEW COMMITTEE*** within 72 hours of notification
iv. Any changes, anticipated or otherwise that may increase the risks or affected safety or welfare of study participants and others or affect the integrity of the research must be reported to ***KENYATTA UNIVERSITY ETHICS REVIEW COMMITTEE*** within 72 hours
v. Clearance for export of biological specimens must be obtained from relevant institutions.
vi. Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. Attach a comprehensive progress report to support the renewal.

vii. Submission of an executive summary report within 90 days upon completion of the study to ***KENYATTA UNIVERSITY ETHICS REVIEW COMMITTEE***

Prior to commencing your study, you will be expected to obtain a research license from National Commission for Science, Technology and Innovation (NACOSTI) https://research-portal.nacosti.go.ke and also obtain other clearances needed.

To serve you better, researchers are kindly requested to access and complete a customer feedback form and sent it back online as you continue with research and upon completion of data collection found on the following website link; ;(https://docs.google.com/forms/d/1ytWefDwvyz5h1oz_VIn0xbxg3uGdlDzMXFWNDsMrRPQ/edit?usp=sharing

Yours sincerely


**Prof. Judith [redacted]**

**Director: Centre for Research Ethics and Safety**

Appendix VI: NACOSTI Approval

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: **935117**

Date of Issue: **03/May/2024**

**RESEARCH LICENSE**

**This is to Certify that Ms.. Lily Njoroge of Kenyatta University, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev.2014) in Laikipia on the topic: Uptake of cervical cancer screening among women aged 18 to 59 years in Laikipia County, Kenya for the period ending : 03/May/2025.**

License No: **NACOSTI/P/24/34900**

**935117**

Applicant Identification Number

Director General
NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Verification QR Code

NOTE: This is a computer generated License. To verify the authenticity of this document, Scan the QR Code using QR scanner application.

**See overleaf for conditions**

Appendix VII: Map of the study area