

Challenges and opportunities to reduce the burden of cervical cancer in a low income, high HIV prevalence context

Adebola Alade Adedimeji (✉ adebola.adedimeji@einstein.yu.edu)

Albert Einstein College of Medicine <https://orcid.org/0000-0002-8012-9124>

Rogers Ajeh

Clinical Research Education, Networking and Consultancy

Amanda Pierz

Yeshiva University Albert Einstein College of Medicine

Relindis Nkeng

Clinical Research Education Networking and Consultancy

Jackson Jr. Ndenkeh

Ludwig-Maximilians-Universitat Munchen Center for International Health

Norbert Fuhngwa

Clinical Research Education Networking and Consultancy

Denis Nsame

Limbe Regional Hospital

Miriam Nji

Emory University School of Public Health

Anastase Dzudie

3A Arastirma Egitim Danismanlik Ltd Sti

Kathryn M. Anastos

Yeshiva University Albert Einstein College of Medicine

Philip E. Castle

Yeshiva University Albert Einstein College of Medicine

Research article

Keywords: Cervical Cancer, Cameroon, Women, Social determinants

Posted Date: January 10th, 2020

DOI: <https://doi.org/10.21203/rs.2.20620/v1>

License:  This work is licensed under a Creative Commons Attribution 4.0 International License.

[Read Full License](#)

Version of Record: A version of this preprint was published on February 18th, 2021. See the published version at <https://doi.org/10.1186/s12905-021-01211-w>.

Abstract

Background

Cervical cancer is a leading cause of death among Cameroon women. The burden of cervical cancer is in part traceable to the inadequate understanding of contextual determinants of access to expanding screening and prevention opportunities. We explored multilevel individual, community and structural factors that facilitate or inhibit cervical cancer prevention in women at risk in a high HIV prevalence context.

Methods

We utilized an exploratory qualitative approach to obtain data through focus group discussions and in-depth interviews. A two-stage sampling strategy was used to select 80 women and 20 men who participated in 8 focus group discussions and 8 in-depth interviews. The socio-ecological model guided the analysis of data to identify micro, meso and macro level determinants of cervical cancer screening.

Results

Micro-level factors-low level of awareness and knowledge about cervical cancer, lack of access to information about screening, low risk perceptions, poor health seeking behaviors and excessive cost of cervical cancer screening were major barriers for women seeking cervical cancer screening. Meso-level factors, such as social networks, socio-cultural norms, perceptions of the role of men and HIV-related stigma when screening is integrated into HIV care, also engender negative attitudes and behaviors. Poorly equipped health facilities and a lack of national cancer prevention policies and programs were among macro-level barriers limiting access to cervical cancer screening.

Conclusion

The success of efforts to reduce the burden of cervical cancer in Cameroon rests on eliminating the myriad individual, familial, community and structural factors that limit access to screening among women in the study communities.

Introduction

Invasive cervical cancer (ICC) is the 4th most common cancer and a leading cause of death among women (1).. In 2018, more than 570,000 cases were newly diagnosed, representing 6.6% of all cancers in women worldwide (2).. Cervical cancer incidence and mortality vary widely by region, but some estimates suggest that more than 90% of cervical cancer deaths occurred among women in low and middle-income countries (LMICs) (2).. Whereas high-income countries (HICs) have been able to limit incidence and mortality due to cervical cancer, women in low and middle-income countries (LMICs) continue to bear a disproportionate burden because they lack resources for prevention, early detection, and treatment.

The current rate of morbidity and mortality from cervical cancer is mostly preventable in the context of a comprehensive approach that includes primary prevention through human papillomavirus (HPV) vaccination and secondary prevention- effective screening, and treatment programs if detected early (2).. In HICs for example, the use of cervical cytology (Pap smear) and HPV testing to detect cervical intraepithelial neoplasia (CIN) has been routinely used to treat ICC in women at risk. In low and middle-income countries, however, limited and often inadequate health infrastructure, lack of trained personnel and exorbitant cost are some of the factors that limit the feasibility and effectiveness of Pap smear tests in screening women.

To address this problem, the World Health Organization recommended several low-cost options that are equally effective at preventing or detecting cervical cancer in women living in LMICs. These include vaccination to protect from common types of HPV that are linked to cancer, and high-risk HPV (hrHPV) DNA testing and/or visual inspection with acetic acid (VIA) with same-day ablative treatment for eligible precancerous lesions in women who can no longer benefit from HPV vaccination (3).. Despite these recommendations, many countries in sub-Saharan Africa (SSA) do not have population-based cervical cancer prevention and control programs. Even in countries with national HPV programs (4), women still face considerable challenges in access to existing programs. These include weak health systems, inadequate funding, and personnel to implement routine screening programs, exorbitant costs associated with screening, low level of awareness and education about existing programs, and late presentation and diagnosis. To eliminate these barriers, many countries are exploring strategies for effective cervical cancer prevention and treatment programs, for example integrating cervical cancer prevention within HIV/AIDS programs to ensure access to women at greatest risk, increase sustainability and limit cost associated with stand-alone programs (5)..

Cameroon, a culturally and ecologically diverse country located in Central Africa, has an estimated population of over 25 million at the end of 2018 (6).. Women make up nearly half of the population of the country and among them, more than 7 million aged = >15 years are at risk of developing cervical cancer (7).. Estimates show that the prevalence of HPV 16 and 18, which is responsible for the majority of cervical intraepithelial neoplasia was 21% among Cameroonian women aged 15–64 years compared with 3.5% for the general population of women in SSA. [8]. Cervical cancer is the second most common cancer among women aged 15–44 years, with a crude incidence rate of 19.1% and mortality rate of 12.5% (7).. Although screening remains an effective strategy for early detection of cervical cancer, many women in Cameroon encounter considerable barriers in accessing screening services. These include inadequate information and access to existing screening options, the prohibitive cost of accessing existing services, poor health-seeking behaviors, stigma, poorly equipped health infrastructure, and other socio-contextual factors. The success of cervical cancer prevention in Cameroon will depend on identifying effective strategies to eliminate these contextual challenges.

Multi-level models that transcend any single level of influence within the social ecology of health behavior, including individual/interpersonal (e.g. level of awareness and knowledge, behaviors related to accessing resources to promote health and wellbeing, perceptions and interpretations of disease), socio-

environmental (e.g. family and social networks, community norms, stigma) and macro-structural factors (e.g. population-based programs, health infrastructure, and policies) is a useful conceptual approach to investigate how these factors constrain women's access to cervical cancer screening and impact their health-seeking behaviors. We utilize the socio-ecological model as a conceptual framework (9) that allows an in-depth investigation of factors at all levels of human interaction and how these facilitate or hinder access to cervical cancer prevention services. The goal of this study, therefore, is to explore and describe multilevel behavioral and structural challenges and opportunities for cervical cancer prevention among women at risk in a high HIV prevalence context in Cameroon.

Data And Methods

Ethical Approval

The Institutional Review Boards of the Albert Einstein College of Medicine, Bronx, New York and the National Research Ethics Committee in Cameroon granted ethical approval for the study.

Study Setting

The study setting is the Regional Hospital, located in the coastal town of Limbe in Southwest Cameroon. The hospital, built around the 1940s was accorded a provincial status in 1972, thereby becoming the principal referral hospital for the southwest region (10).. Limbe Regional Hospital (LHR) is also called the "Mile One Hospital" because of its location about one mile from the Atlantic Ocean (10).. Since its establishment, the hospital has experienced several structural and organizational problems that have limited its capacity in providing adequate health services for the population it serves.

Research design and study population

This study utilized an exploratory-descriptive qualitative approach and was conducted as part of a study assessing cervical HPV infection and neoplastic disease in women living with HIV (WLHIV) all embedded within the Central Africa International Epidemiology Database to Evaluate AIDS (CA-leDEA) project in Cameroon (11).. The study population consisted of women living with HIV (WLHIV) and those not living with HIV (HIV-negative) who met the following eligibility criteria: aged ≥ 25 , ever or currently sexually active, not pregnant at enrollment into the study, never screened for or diagnosed with cervical cancer, was able to provide both self-collected and provider collected biological samples for HPV testing and was able to understand and sign the informed consent. In addition, male spouses or partners of enrolled were recruited to explore men's perspectives and attitudes toward cervical cancer screening.

Sample selection

We utilized a two-stage sampling strategy to select the women and men who participated in focus group discussions (FGDs) and in-depth interviews (IDIs). In the first stage, we utilized the master list of 877 women represented in the parent study to identify and generate a list of 585 WLHIV and 292 HIV-negative women. The second stage was the systematic sampling of 36 WLHIV who participated in 3 FGD sessions (12 in each FGD) and 4 WLHIV who participated in IDIs. The process was repeated to select the same number for FGDs and IDIs among HIV-negative women.

The selection of FGD discussants and IDI interviewees was done after the study nurses contacted potential participants, provided information about the study and invited those who were interested to participate in the FGD or IDI. Recruitment of male FGD participants was done by asking the women in each focus group to invite their spouses or significant others to participate in the study. A list of all male spouses who agreed to participate was developed and each spouse was contacted by the study team to participate in the men's focus group discussions. The first 10 male spouses in each category who responded were then invited to join each of the discussion groups.

Data collection

Focus group discussions and in-depth interviews were held between May and August 2018. The rationale for using FGDs and IDIs was to better understand and describe women's knowledge, attitudes, and practices regarding cancers in general, cervical cancer, HPV infection, screening as well as behavioral and structural facilitators and barriers to cervical cancer prevention. Additional information was obtained to assess and compare perceptions and preferences for self-versus health provider-collected biological specimens to understand women's preferences given peculiar contextual factors that facilitate or inhibit access to cervical cancer screening for women at risk. Focus groups with male spouses and partners explored similar issues, including their knowledge and attitudes about cancer and cervical cancer screening, as well as if and how they provide support to wives and significant others in cervical cancer prevention, treatment and care.

Overall, we organized 6 women and 2 men's focus groups, and 8 individual in-depth interviews. These consisted of 3 focus groups for women living with HIV (WLHIV) and 3 focus groups for HIV negative women by the following age categories: 25–35 years, 36–45 years and ≥ 46 years. Two additional focus groups, (1 for partners of WLHIV and 1 for partners of HIV negative women) were organized for male spouses. Each focus group consisted of 12 people grouped together based on homogeneous characteristics such as age, literacy, socio-economic status and known HIV status category. In addition, 8 in-depth interviews (4 in each category) were held with women study participants.

The focus groups and in-depth interviews were held at an easily accessible and unanimously agreed location within the premises of Limbe Regional Hospital that afforded anonymity to respondents as well as the confidentiality of the information provided by participants. The language used for the interviews and focus group discussion was "*pidgin*", a colloquial form of the English language that is widely spoken in the area. A team of 3 trained research assistants (a moderator, note-taker and observer) facilitated

each focus group session, while a team of two, (a moderator and note-taker) facilitated the in-depth interviews. Each focus group lasted 90 minutes on average while in-depth interviews lasted an average of 60 minutes. Each participant in the focus group and in-depth interview received an incentive of approximately \$5 (USD) to cover the cost of transportation and other logistics of participation. Prior to starting the group discussion, each participant was required to complete the informed consent process.

Measures

To facilitate data collection, a semi-structured guide was developed by the research team. The guide was organized around a series of specific themes, each with several open-ended questions. The themes that we explored included (i) knowledge, attitudes and behaviors regarding cervical cancer and association with HPV infection, (ii) individual/interpersonal, socio-economic and cultural influences on cancer screening, including stigma (iii) perceptions of the need for and utilization of cervical and reproductive cancer screening, (iv) user experiences regarding self-collected versus provider collected methods for biological samples, (v) men's perceptions, attitudes and support for cervical cancer prevention among women, and (vi) macro-contextual factors, including cost, accessibility and availability of screening services for women in the study areas.

In addition, participants also discussed social-contextual factors that influence beliefs, attitudes, perceptions of personal risk and community actions that can contribute to cancer prevention including combining screening for non-communicable diseases such as cervical cancer with HIV testing, role of men in cancer prevention as well as effective strategies/mediums for disseminating cancer prevention educational materials. This design of the guide around these specific measures provided valuable insights in the context of cultural and normative factors influencing perceptions, behaviors and the degree to which participants consider access to preventive care as an important component of cervical cancer prevention.

Data processing

Several steps were taken to process the data generated from the FGDs and IDI. First, at the end of each discussion session and interview, the team of the moderator, note-taker and observer for each FGDs held daily debriefing meetings primarily to reconcile notes from each team member with the audio recording of the FGD. This step required each team member to listen to the audio recording and cross-check the audio with the notes taken during the interview to ensure consistency and to fill in any gaps in the notes. Upon reconciliation, audio recordings and field notes were labeled with information regarding the location of the interview, basic information about the participant(s), pertinent interview information including, date, starting/ending time of the interview and names of the moderator, note-taker and observer (in case of FGDs). The process contributed to the quality of data generated and ensured consistency in the way the data was managed.

Second, the group that facilitated the discussions and interviews held daily debriefing meetings with the larger research team to give and receive feedback in terms of what they did well and needed to improve on for subsequent interviews. Prior to these briefing sessions, other members of the research team who did not participate in the interview listened to the audio recordings so they can provide feedback to the team that facilitated the discussion session or interview. This process helped ensure continuous quality improvement in the data that was obtained as well as in identifying important lines of inquiry that need further exploration if they emerge during subsequent interviews.

Thirdly, audio recordings were transcribed in "*pidgin*", the language of communication during the interviews. Translation into English was then done to ensure that those not familiar with *pidgin* were able to understand the information obtained from the discussion and interviews. Like the process used in transcribing, translation of transcripts from *pidgin* to English was done by members of the research team who were not part of the group that facilitated the interview/discussion. The transcripts were independently verified, checked for completeness and scanned to ensure all personal identifiers had been deleted.

Analytical approach

The socio-ecological model (9) was the analytical framework that guided the analysis. The analytical process began with data immersion, an essential step in the analytical plan. Immersion involved team members doing the following: (i) listened to audio recording of each interview (ii) read the field notes taken by interview team, (iii) read original verbatim transcripts and translations to ensure consistency with all the data sources and ensure familiarity with the data prior to identifying themes and developing a codebook. This facilitated the identification/validation of *a priori* themes that were initially developed by the lead author.

The development of the codebook followed a three-stage iterative and continuous process. The first stage involved an inductive-deductive analysis of the transcripts, which involved iteratively reviewing, interpreting and discussing verbatim texts of participants' ideas, opinions, and experiences about cervical cancer. This allowed us to identify substantive themes that emerged from the focus group discussions and in-depth interviews. The second stage entailed a much more detailed analysis of the text, which resulted in identifying and developing codes that were organized based on the themes. The codes that emerged from this process were subject to discussion and review by the study team before they were applied to the transcripts. Disagreements regarding applied codes or whether codes fit into a theme of interest were discussed by the study team to arrive at a consensus. Finally, we mapped the results by each domain unto an ecological framework and organized the results by their relationship to micro, meso, and macro-structural factors regarding cervical cancer in the study setting.

Results

We adopted the socio-ecological model to identify and describe factors that facilitate or hinder access to cancer prevention and control for women in the study community. At the micro (individual) level we describe awareness, knowledge, risk perceptions and behaviors that impact access to and utilization of cervical cancer screening programs. The meso level factors include familial, social network, community and cultural norms that influence perceptions and utilization of cervical cancer prevention, and the macro-level factors focus on those related to overall macro-structural factors including the health system and policies that facilitate or inhibit access to cervical cancer screening and prevention.

Micro level (Individual) factors

Awareness and knowledge

Awareness and knowledge of cancers in general and cervical cancer is specifically important in cancer prevention and control. We found that nearly all participants were aware of at least one type of cancer, with cervical and breast cancers being the two most mentioned among female participants. Although most participants mentioned at least one type of cancer, only a few, mostly younger women, were able to demonstrate knowledge of risk factors associated with each type of cancer. Younger women, for instance, reported that sexual intercourse with multiple partners is a lifestyle risk factor in addition to exposure to genetic and/or environmental factors. Older women who subscribe to myths or misconceptions about cervical cancer demonstrated generally poor knowledge of risk factors. Their opinion is reflected in the words of one participant who said:

"... hmmm vaginal candidiasis, which comes from using unhygienic and unsanitary public restrooms is the reason for many women diagnosed with cervical cancer. In addition, there are lots of women who wear "second hand" clothing, including underwear filled with germs that can cause this problem". (FGD, Female HIV-negative 36–45 years)

Knowledge of the relationship between HPV and cervical cancer was generally poor. Younger and older participants demonstrated no knowledge that persistent infection with HPV, especially types 16 and 18 is strongly linked to cervical cancer. None of the older women reported having ever heard about HPV, and only a few of the younger women recalled having heard about HPV.

Risk perceptions and health-seeking behaviors

Risk perception and susceptibility to long term health outcomes are critical in taking preventive actions to avoid disease acquisition. Most participants acknowledged that a lot of people were at risk of a cancer diagnosis, especially given the increased number of cases recently being reported. With increased cancer incidence, there was a consensus that anyone is susceptible to being diagnosed with cancer if exposed to the risk factors. Perceptions of the severity of the risk, however, varied between different categories of

participants. For example, older, less educated HIV-negative women were least likely to perceive any risk, whereas older WLHIV were more likely to report higher risk perceptions. Similarly, younger women regardless of HIV status reported a vulnerability to some risk factors, for example being in a sexual relationship in which they or their partners have sex with multiple partners.

Individual perceptions of risk influence preventive behaviors. Although none of the participants had ever been screened for cervical cancer, those with higher educational levels or better knowledge of risk factors reported having previously acted or "*did something*" to minimize their exposure to risk. Younger women who discussed environmental, genetic and lifestyle risk factors reported taking preventive actions consistent with their beliefs about their vulnerability. Among older women, there were instances when the reported preventive action was based on their myths or misconceptions about cancers. One respondent reported that:

"Like cervical cancer, I've heard that allowing antiseptic soap to penetrate the vagina during a bath can cause cervical cancer, therefore, I make sure I do not use antiseptic soap to wash my vagina when taking a bath". (FGD, Female HIV-negative = >46 years)

Despite the consensus that most women were susceptible to cervical cancer, some participants did not consider themselves to be at risk. Those in this category agreed with statements expressed by a participant who said: *"I take care of myself and I am sure I don't have anything that will bring me cancer"*. We also found that knowing someone who was diagnosed with cancer strongly influences the perception of risk and willingness to initiate preventive behaviors.

Participants who reported family members or friends diagnosed with or having died from cervical cancer were more likely to report higher risk perceptions and to acknowledge the importance of preventive behaviors such as screening and obtaining information for cancer prevention. This was particularly common among a group of older WLHIV who reported knowing someone living with or died from cancer. They were also more likely to encourage others to take preventive active measures or to be better informed about the importance of cervical cancer prevention.

Lack of access to information about cervical cancer screening services

Access to information about cancers largely influences an individual's knowledge, risk perception, and health seeking behavior. Our data did not show that women in the study communities have access to any source where they can obtain information about cervical cancer. This meant that the few who sought information about cervical cancer resorted to browsing the internet to obtain the information. Similarly, the private health facilities operating within the community that offered screening or other services related to cervical cancer. The gap in access to information or services was highlighted by participants as a challenge for those who desired to prevent cervical cancer. Most participants agreed that the absence of reliable, consistent and fact-based information created opportunities for mischievous individuals to

spread false, negative and potentially dangerous information about cervical cancer. Further, they agreed that "access to reliable and factual sources of information or services about cervical cancer is critical to preventing the high number of deaths that occur due to late diagnosis and presentation". One participant in the focus group of younger HIV-negative women indicated that:

"...the limited or complete lack of access to reliable and trusted sources of health information represented a major hurdle for those who know the dangers of cervical cancer, but do not know how to access reliable and trusted information to enable them to take appropriate preventive actions. In an environment rife with myths, misconceptions and mixed messages from the internet, obtaining relevant information about the importance of cervical cancer prevention is critical for women's preventive behaviors." (FGD, HIV-negative 25–35 years)

Cost as a deterrent to cervical cancer screening

In the absence of publicly funded cervical cancer screening programs, women who want to be screened for cervical cancer have few privately run health facilities, which are often prohibitively expensive and outside the reach of most women. In discussing the cost of services as a challenge to cervical cancer prevention, there was universal consensus that:

"cost is perhaps the biggest challenge to obtaining cervical cancer screening, not only in the communities but for low-income women everywhere". Without money, it is impossible to obtain health services even in government run hospitals" (FGD, WLHIV 36–45 years)

In women and men's discussion groups, participants agreed that the economic situation in the country, with high unemployment rates, meant that families struggling with meeting basic needs for daily survival were likely to consider paying for cervical cancer prevention very low on their list of priorities even in situations where they consider it to be fatal. Indeed, many women participants reported that they were screening for cervical cancer for the first time only because the service was free (as part of the study). Despite not having to pay for screening, the participants still indicated that the cost of transport from their homes to the screening center was a major expense that only a few can accommodate within very tight budgets. Most of the women who showed up for screening did so only because they knew they would be reimbursed for their transportation costs. The words of a woman respondent captured participants' feelings about how cost constitutes a barrier to accessing screening:

"It would have been impossible for me [many of us] to show up for the free screening if not that we knew we would be given transport money for coming. I know that if the service was not free, many women will not be able to come, therefore we are grateful to this hospital for this free service and even paying the cost of transportation to come." (FGD, Female HIV-negative 36–45 years)

Another respondent emphasized this point when she said:

“When they asked me if I want to join the study, I told them I was not interested because I was not sure how much it will cost and I do not have the money to pay for something like this. It was when they told me that I do not have to pay that I agreed to join. How and where would I get the money if I have to pay?”
(FGD, Female HIV-negative 25–35 years)

Similar opinions were expressed by male participants who suggested that families that struggle with meeting their basic needs for survival will not be able to pay the cost of screening from their meager budget for other essentials.

<2>Meso-level (community norms and social networks) factors

Social networks and social norms

Social networks and prevailing social norms are critical in shaping individual attitudes and behaviors toward cervical cancer prevention. Our data shows that characteristics of social network members such as age, educational attainment, socioeconomic status, and health-seeking behaviors influence individuals’ knowledge, attitudes and behaviors. Similarly, the type of information that is circulated within one’s social network also determines the extent of knowledge as well as myths or misconceptions that individuals hold about cervical cancer.

Women who reported that they knew about cervical cancer risk factors conceded their knowledge is shaped by what they heard, perhaps from the media, but more importantly by the information that is validated or refuted by their social network. For instance, participants who reported better knowledge of risk factors conceded their knowledge was shaped by and behaviors conform to expectations set by their social networks. Conversely, women who demonstrated poor knowledge or perception of risk were more likely to have friends and acquaintances who hold similar myths or misconceptions about cervical cancer. Thus, social networks and social norms were critical in disseminating and/or validating information about cervical cancer and options for prevention.

Cultural norms and the role of men

Both male and female participants extensively discussed the powerful influence of cultural norms in shaping men’s attitudes and behaviors towards cervical cancer prevention. Female participants described cultural notions and nuances that often inhibit men from participating in initiatives to promote their own health, much less the health of their spouses. They suggested that men generally do not take much interest in women’s health issues nor encourage preventive behaviors. While there was a consensus that men needed to be proactive in cervical cancer prevention, there were differences between younger and older women in their expectations regarding how much men should be doing in helping their spouses prevent cervical cancer. Unlike older women, younger women were more forthcoming in expressing their

opinion regarding how men should be more interested in taking concrete actions to help their spouses prevent cervical cancer. As one respondent suggested:

“it should start by not having multiple sexual partners, which increases the risk of passing on a sexually transmitted infection”. (FGD, Female HIV-negative 25–35 years)

Older women shared the view that most men were constrained in terms of what they can do and that men’s lack of interest in the health of their spouses is the result of cultural expectations and/or notions of how men should conduct themselves. As one participant reported:

“a man who takes too much interest in women’s health runs the risk of being labeled by society and many men want to avoid such perceptions”. (FGD, WLHIV 36–45 years)

Men’s attitudes toward cancer prevention are shaped both by these cultural norms as well as their level of education and knowledge of risk factors for cancer. Generally, male participants with negative attitudes about cancer were those most likely to believe in myths and misconceptions about cancer. Similar to the women who hold myths about cancer, some men suggested that cervical cancer, for instance, is most likely to be diagnosed in women who take their hygiene for granted by using second-hand clothes or their toilet habits or those who believed that such women were promiscuous. This category of men believed that very little can be done to prevent cervical cancer. A male participant suggested that the way to prevent a diagnosis of cervical cancer is for *“women to avoid using clothing, unsanitary conditions and not sleep around”*. Men with higher levels of education demonstrated better knowledge of the risk factors and positive attitudes for cervical cancer prevention, including actively encouraging spouses to be aware of the risk and getting screened for cervical cancer. One male participant reported that

“preventing cervical cancer is a responsibility both men and women should share equally; it should begin with preventing sexually transmitted infections, avoiding risk factors and obtaining screening when possible”. (FGD, Male Partners of HIV-negative Women)

HIV and health-related social stigma

Health-related stigma is a barrier to cervical cancer prevention. Ignorance and the fear of death associated with cancers contribute to the pervasive stigma surrounding cervical cancer. The belief that cervical cancer is untreatable was widespread given the number of people reported to have died from one type of cancer or another. This perception continues to fuel stigma and, in some cases, the reluctance to screen voluntarily. Often, health conditions with high mortality rates were generally stigmatized. The perception that cervical cancer is a disease associated with women’s reproductive organs also contributed to stigma given the cultural norms around female sexuality. As some female participants suggested, the association of cervical cancer with either a woman’s reproductive organs or their sexual behavior is generally stigmatized. Some male respondents suggested that *“a woman diagnosed with cervical cancer may have herself to blame”*.. One female participant reported that:

“...women’s bodies are subject to all manner of sociocultural regulations and norms that men’s bodies are excluded from. Thus, any condition that affects women, especially their reproductive organ will be stigmatized even if they are not to blame.” (FGD, Female HIV-negative, 25–35 years)

Macro-structural (health system, health policy) factors

Weak health system and lack of infrastructure

Participants described numerous macro-structural challenges to cervical cancer prevention and control in the study community. Among others, a weak health system, poorly equipped facilities, and poorly trained staff, all of which are necessary for cervical cancer prevention and control were mentioned by participants as some of the most important structural barriers. Many participants suggested that the lack of cervical cancer screening facilities in the regional hospital means that most women cannot access services within their community unless they go to large urban centers if they want to be screened. The lack of basic equipment for screening, shortage of trained health workers who can barely keep up with demand, old and dilapidated buildings and lack of comprehensive policies that can aid awareness about and encourage positive attitudes towards cervical cancer screening were identified among the most challenging barriers.

Additionally, the high prevalence of HIV/AIDS in Cameroon and the focus on increasing access to prevention, care and treatment for people living with HIV/AIDS meant limited resources were available for other health issues including cancer prevention. Only recently has attention began to shift to the importance of addressing HIV associated comorbidities in women at risk. Some participants described the existence of a few private clinics where it is possible to obtain screening for cervical cancer. However, they described additional challenges with accessing services from these private clinics, which are often exorbitant and besides the lack of trust in providers’ skills. As one participant reported:

“Private clinics are expensive and want to make as much money instead of providing appropriate care. I know of people who started going to a private clinic to receive care but came back to the Mile 1 [the Regional Hospital] because of poor treatment” (FGD Female HIV-negative, 36–45 years)

Lack of cancer prevention policies

The group of younger more educated women discussed challenges at the policy level. First, they highlighted the extensive focus on HIV/AIDS, which has resulted in a lack of attention on other important health issues, such as cervical cancer and suggested that more needs to be done regarding cervical cancer prevention. They also cited the ongoing political situation and marginalization, which meant that government officials only pay lip service to improve population health. Further, they discussed the rural-

urban disparity in which health facilities in larger urban areas were better equipped and staffed compared to semi-urban or rural ones.

Cervical cancer screening in the context of HIV/AIDS care and treatment program

The integration of cervical cancer screening within general HIV care and treatment programs has been recommended as an effective way to increase access to screening for women at risk. We assessed participants' perceptions and attitudes to the effectiveness of this approach. The WLHIV already in care agreed that such an approach was beneficial as they are able to continue their treatment for HIV and at the same time be screened for cervical cancer. This helps them reduce their risk and the number of hospital visits given the cost implications if the services were separated. Women of unknown HIV status or those who previously tested negative for HIV, however, objected to the idea of a combined approach. The stigma of HIV and the fear of being seen going into an HIV treatment center and/or is suspected of living with HIV was cited as an impediment to why they would not utilize cervical cancer screening offered within HIV care and treatment programs.

Similar opinions were expressed by male participants who suggested that it would be difficult for women, especially if they are reluctant to test for HIV and those who do not want to be seen going into an HIV clinic because of stigma. They indicated that it was not a good idea to combine cervical cancer screening with HIV testing only because women who go in for cervical cancer screening may be suspected of having HIV even if they do not. Both female and male participants, however, expressed positive attitudes and support for community-based cervical cancer screening programs in which women had the opportunity to access screening within their homes or in community settings.

Discussion

Invasive cervical cancer is a leading cause of death among women in low and middle-income settings. Although cervical cancer is largely preventable, women in LMICs are disproportionately burdened because they lack access to prevention and treatment strategies that are widely available in high-income settings. Increasingly, cervical cancer prevention programs, including population-based HPV vaccination, are now being implemented in several countries in sub-Saharan Africa. These programs are beset by challenges and are yet to have the desired impact in reducing morbidity and mortality due to invasive cervical cancer (4,12, 13).. The failure of existing programs is in part due to a lack of understanding of multi-level socio-contextual determinants of access, utilization, and effectiveness of existing interventions, which are important to reduce incidence and mortality and eliminate disparity in access to care. Our study explored these multi-level socio-behavioral and contextual-structural factors that are vital to the success of cervical cancer prevention programs in sub-Saharan Africa.

Micro, meso and macro level factors facilitate or hinder access to and utilization of cervical cancer prevention programs. At the micro-level, women's knowledge about cervical cancer critically determines attitudes and behaviors towards cervical cancer prevention. Similar to findings in other studies (14, 15, 16), women in Limbe were aware of the grave risk that cervical cancer poses for health. They demonstrated high-risk perception by indicating that anyone was at risk given the number of people they know who were diagnosed with or died from cancer. Regardless, they had poor knowledge of risk factors including sexual transmission of HPV as the main risk factor in cervical cancer. This finding supports the conclusion from previous studies (17) on the need to develop and implement theory-driven population-based cervical cancer educational programs in this study setting and similar ones across sub-Saharan Africa.

Poor knowledge of risk factors coupled with the high mortality from late diagnosis, contributes to a widespread belief that cervical cancer is incurable and ultimately leads to death. In many settings, people with diseases that are deemed incurable are often stigmatized because of their implications for health and wellbeing (18, 19, 20). The perception of cervical cancer as an incurable disease makes it important to target stigma reduction as a component of any educational intervention aimed at improving knowledge and attitudes and encouraging positive preventive behaviors. The stigma reduction framework proposed by Stangl and colleagues [21] could be a useful starting point to eliminate health related stigma.

At the meso level, family, social network and community characteristics powerfully shape women's knowledge and behaviors about health, including cervical cancer, as well as facilitate access to resources for support. The importance of social networks in influencing health-related knowledge and behaviors have been previously described (22, 23, 24). Studies have also documented ways in which social networks can be important sources of support for promoting health and wellbeing (25, 26, 27). Individually and collectively, members of social networks provide social, emotional and financial support for those dealing with a health issue. In this study, we found that characteristics of social network members, including age, education, knowledge, attitudes, and perceptions about cervical cancer, in turn, shaped women's opinions and preventive behaviors. Given the important role of social networks, it is necessary to consider interventions that empower social networks so they can promote positive behaviors among their members.

Human papillomavirus, especially HPV 16 and 18 is a risk factor in cervical cancer. The heterosexual transmission of HPV especially types 16 and 18, which have been linked to invasive cervical cancer, highlight the important role of men in cervical cancer prevention. Male responsibility should focus on reducing the risk of HPV transmission, for example by limiting the number of sexual partners and using their influence as cultural gatekeepers/heads of households to encourage women and girls to receive the HPV vaccination.

Similar to other studies that have explored male involvement in cervical cancer prevention, we found that most male respondents had poor knowledge of HPV as a risk factor in cervical cancer (28, 29, 30).

Consequently, there is an urgent need to implement educational interventions aimed at increasing men's knowledge of risk factors and empowering them to be more proactive in preventing cervical cancer. Furthermore, the cultural norms of masculinity that dictate roles and set expectations that discourage male involvement in promoting women's reproductive health or their ability to engage in cervical cancer prevention should be addressed.

Inadequate health infrastructure and lack of resources for cervical cancer prevention in many settings in SSA has led increasing efforts to integrate cervical cancer screening within HIV care and treatment programs. A systematic review by Sigfrid, et. al., (31) suggested that interventions based on different models of service delivery may be feasible and acceptable to women. However, our findings suggest that this may not necessarily apply in our setting. The stigma of HIV still presents as a major challenge for women willing to undergo screening for cervical cancer in contexts where such screening is offered within HIV/AIDS prevention, care, and treatment programs. Persistent HIV stigma will limit women's access to cervical cancer screening programs that are integrated within HIV treatment programs. This makes it unlikely that the WHO's recommendation of integrating cervical cancer prevention within HIV programs will have the desired impact in communities where HIV stigma is intense. Therefore, for this approach to succeed in increasing access, intervention programs must consider the cultural nuances and community attitudes around health-related stigma so as to better understand how this can affect women's preferences for accessing cervical cancer screening that is integrated within HIV programs.

At the macro-structural level, a weak health system, poorly equipped health facilities, shortage of trained personnel, out of pocket cost to access screening and the absence of population-based cervical cancer prevention programs continue to inhibit women's abilities in preventing cervical cancer. Without government led population-based program and policy initiatives aimed at reducing the incidence of cervical cancer and improving access to care and treatment for women at risk, it is likely that Cameroon, a high HIV burden country, will also remain a high burden country for cervical cancer. Presently, non-governmental actors, most of whom depend on external funding sources, dominate the landscape in providing access to prevention and treatment for women at risk. Based on lessons in other settings (32, 33), implementing structural reforms to ensure women have access to appropriate, cost-effective and user-friendly options while strengthening health system capacity for cervical cancer prevention is critical in addition to continuing to empower non-governmental actors in providing care to women most at risk.

Conclusion

The findings presented in this paper demonstrate the importance of the individual, familial, community and structural factors that facilitate or hinder access to cervical cancer prevention for women at risk in the study community. Nonetheless, we caution that the interpretation of the results warrants caution given the qualitative nature of the data, the participants selected and more importantly that setting of the study within the context of a larger ongoing clinical study. These issues may limit the extent to which results are generalizable to women in other settings. Nonetheless, the results highlight the challenges in

cervical cancer prevention across many LMIC settings, thus raising an urgent need to implement population-based measures to mitigate the impact of cervical cancer for women in Cameroon.

Declarations

Acknowledgment:

We want to thank all the women who participated in the study, the management and staff of Limbé Regional Hospital for facilitating the conduct of this study.

Disclosures:

This study received Xpert HPV tests from Cepheid (Sunnyvale, CA, USA) at a reduced cost. Dr. Castle has received HPV tests and assays for research from Roche, Becton Dickinson, Cepheid, and Arbor Vita Corporation at a reduced or no cost.

Funding:

Research reported in this publication was supported by a supplement (3P30CA013330–43S1A) from the National Cancer Institute to the Albert Einstein Cancer Center (3P30CA013330) and the National Institutes of Health/National Institute of Allergy and Infectious Diseases under Grant Number 5U01AI096299–04 (PI: Anastos and Nash). The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.”

References

1. World Health Organization/GLOBOCAN. Cervix uteri. Available at: <https://gco.iarc.fr/today/data/factsheets/cancers/23-Cervix-uteri-fact-sheet.pdf>
2. World Health Organization. Cervical Cancer. Available at: <https://www.who.int/cancer/prevention/diagnosis-screening/cervical-cancer/en/>
3. Shrestha AD, Neupane, D, Vedsted P, Kallestrup P. Cervical Cancer Prevalence, Incidence and Mortality in Low and Middle Income Countries: A Systematic Review. *Asian Pacific journal of cancer prevention : APJCP*, 19(2), 319–324. doi:10.22034/APJCP.2018.19.2.319
4. Black E, Richmond R. Prevention of Cervical Cancer in Sub-Saharan Africa: The Advantages and Challenges of HPV Vaccination. *Vaccines (Basel)*. 2018;6(3):61. Published 2018 Sep 8. doi:10.3390/vaccines6030061
5. Mwanahamuntu BH, Sahasrabuddhe VV, Stringer JSA, Parham GP. Integrating Cervical Cancer Prevention in HIV/AIDS Treatment and Care Programs. *Bulletin of the World Health Organization*. Available at <https://www.who.int/bulletin/volumes/86/8/08-056275/en/>

6. World Population Review. Cameroon Population, 2019. Available at <http://worldpopulationreview.com/countries/cameroon-population/>
7. Catalan Institute of Oncology/International Agency for Research on Cancer. Cameroon: Human Papillomavirus and Related Cancers Fact Sheet, 2018. Available at: https://hpcvcentre.net/statistics/reports/CMR_FS.pdf
8. Sankaranarayanan R, Qiao Y, Keita N. The next steps in cervical screening. *Womens Health Lond. Engl.*, 2015. Vol. 11, no. 2, pp. 201–212.
9. Kristin AR, Judith KO, Lori P. *The Handbook of Health Behavior Change, 4th Edition*, (2013). Springer Publishing Company.
10. Limbe Regional Hospital. Available at https://en.wikipedia.org/wiki/Limbe_Provincial_Hospital
11. The International Epidemiology Databases to Evaluate AIDS. Available at: <https://www.iedea.org/>
12. Rahman R, Clark MD, Collins Z, Traore F, Dioukhane EM, Thiam H, Ndiaye Y, De Jesus EL, Danfakha N, Peters KE, Komarek T, Linn AM, Linn PE, Wallner KE, Charles M, Hasnain M, Peterson CE, Dykens JA. Cervical cancer screening decentralized policy adaptation: an African rural-context-specific systematic literature review, *Global Health Action*, 2019. Vol 12:1, 1587894, DOI: 10.1080/16549716.2019.1587894
13. Delany-Moretlwe S, Kelley KF, James S, et al. Human Papillomavirus Vaccine Introduction in South Africa: Implementation Lessons From an Evaluation of the National School-Based Vaccination Campaign. *Glob Health Sci Pract.* 2018;6(3):425–438. Published 2018 Oct 4. doi:10.9745/GHSP-D-18-00090
14. Nkfusai NC, Cumber SN, Anchang-Kimbi JK, Nji KE, Shirinde J, Anong ND. Assessment of the current state of knowledge and risk factors of cervical cancer among women in the Buea Health District, Cameroon. *Pan Afr Med J.* 2019;33:38. Published 2019 May 21. doi:10.11604/pamj.2019.33.38.16767
15. Gatumo M, Gacheri S, Sayed AR, Scheibe A. Women's knowledge and attitudes related to cervical cancer and cervical cancer screening in Isiolo and Tharaka Nithi counties, Kenya: a cross-sectional study. *BMC Cancer.* 2018;18(1):745. Published 2018 Jul 18. doi:10.1186/s12885-018-4642-9
16. Shiferaw S, Addissie A, Gizaw M, et al. Knowledge about cervical cancer and barriers toward cervical cancer screening among HIV-positive women attending public health centers in Addis Ababa city, Ethiopia. *Cancer Med.* 2018;7(3):903–912. doi:10.1002/cam4.1334
17. Musa J, Achenbach CJ, O'Dwyer LC, et al. Effect of cervical cancer education and provider recommendation for screening on screening rates: A systematic review and meta-analysis [published correction appears in *PLoS One.* 2017 Dec 29;12 (12):e0190661]. *PLoS One.* 2017;12(9):e0183924. Published 2017 Sep 5. doi:10.1371/journal.pone.0183924

18. Pachankis JE, Hatzenbuehler ML, Wang K, et al. The Burden of Stigma on Health and Well-Being: A Taxonomy of Concealment, Course, Disruptiveness, Aesthetics, Origin, and Peril Across 93 Stigmas. *Pers Soc Psychol Bull.* 2018;44(4):451–474. doi:10.1177/0146167217741313
19. van Brakel WH, Cataldo J, Grover S, et al. Out of the silos: identifying cross-cutting features of health-related stigma to advance measurement and intervention. *BMC Med.* 2019;17(1):13. Published 2019 Feb 15. doi:10.1186/s12916-018-1245-x
20. Nyblade L, Stockton M, Travasso S, Krishnan S. A qualitative exploration of cervical and breast cancer stigma in Karnataka, India. *BMC Womens Health.* 2017;17(1):58. Published 2017 Aug 2. doi:10.1186/s12905-017-0407-x
21. Stangl AL, Earnshaw VA, Logie CH, et al. The Health Stigma and Discrimination Framework: a global, crosscutting framework to inform research, intervention development, and policy on health-related stigmas. *BMC Med.* 2019;17(1):31. Published 2019 Feb 15. doi:10.1186/s12916-019-1271-3
22. Adedimeji A, Sinayobye JD, Asiimwe-Kateera B, et al. Social contexts as mediator of risk behaviors in Rwandan men who have sex with men (MSM): Implications for HIV and STI transmission. *PLoS One.* 2019;14(1):e0211099. Published 2019 Jan 18. doi:10.1371/journal.pone.0211099
23. Luque JS, Opoku S, Ferris DG, Guevara Condorhuaman WS. Social network characteristics and cervical cancer screening among Quechua women in Andean Peru. *BMC Public Health.* 2016;16:181. Published 2016 Feb 24. doi:10.1186/s12889-016-2878-3
24. Mbah O, Ford JG, Qiu M, et al. Mobilizing social support networks to improve cancer screening: the COACH randomized controlled trial study design. *BMC Cancer.* 2015;15:907. Published 2015 Nov 16. doi:10.1186/s12885-015-1920-7
25. Balfe M, Keohane K, O'Brien K, Sharp L. Social networks, social support and social negativity: A qualitative study of head and neck cancer caregivers' experiences. *European Journal of Cancer Care* 2017 Nov;26(6). doi: 10.1111/ecc.12619. Epub 2016 Dec 22.
26. Crookes DM, Shelton RC, Tehranifar P, et al. Social networks and social support for healthy eating among Latina breast cancer survivors: implications for social and behavioral interventions. *J Cancer Surviv.* 2016;10(2):291–301. doi:10.1007/s11764-015-0475-6
27. Barton C, Effing TW, Cafarella P. Social support and social networks in COPD: A scoping review. *COPD: Journal of Chronic Obstructive Pulmonary Disease* 2015;12(6):690-702. doi: 10.3109/15412555.2015.1008691. Epub 2015 Aug 11.
28. Rosser JI, Zakaras JM, Hamisi S, Huchko MJ. Men's knowledge and attitudes about cervical cancer screening in Kenya. *BMC Womens Health.* 2014;14:138. Published 2014 Nov 22. doi:10.1186/s12905-014-0138-1

29. Williams MS, Amoateng P. Knowledge and beliefs about cervical cancer screening among men in Kumasi, Ghana. *Ghana Med J.* 2012;46(3):147–151.
30. Kim HW, Kim DH, Kim Y. Men's awareness of cervical cancer: a qualitative study. *BMC Womens Health.* 2018;18(1):155. Published 2018 Sep 24. doi:10.1186/s12905-018-0650-9
31. Sigfrid L, Murphy G, Haldane V, et al. Integrating cervical cancer with HIV healthcare services: A systematic review. *PLoS One.* 2017;12(7):e0181156. Published 2017 Jul 21. doi:10.1371/journal.pone.0181156
32. Bingham A, Bishop A, Coffey P, Winkler J, Bradley J, Dzuba I, Agurto I. Factors affecting utilization of cervical cancer prevention services in low-resource settings. *Salud Publica Mex.* 2003;45 Suppl 3:S408-16.
33. Devarapalli P, Labani S, Nagarjuna N, Panchal P, Asthana S. Barriers affecting uptake of cervical cancer screening in low and middle income countries: A systematic review. *Indian J Cancer.* 2018 Oct-Dec;55(4):318-326. doi: 10.4103/ijc.IJC_253_18.