Partnering with traditional Chiefs to expand access to cervical cancer prevention services in rural Zambia

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Abstract

Objective: To evaluate how the influence of traditional Chiefs can be leveraged to promote access to cervical cancer prevention services in rural Zambia.

Methods: A retrospective review of outcome data was conducted for all screening outreach events that occurred in Zambian Chiefdoms between October 4, 2015, and October 3, 2016. Members of the health promotion team of the Cervical Cancer Prevention Program in Zambia visited local Chiefs to inform them of the importance of cervical cancer prevention. The local Chiefs then summoned adults living within their Chiefdoms to assemble for cervical cancer prevention health talks. Screen-and-treat services were implemented within each of the Chiefdoms over a 1-week period.

Results: VIA-enhanced digital imaging of the cervix (digital cervicography) was offered to 8399 women in ten Chiefdoms as part of a village-based screening (VBS) program. In all, 419 (4.9%) women had positive screening test results. Of these women, 276 (65.8%) were treated immediately with thermocoagulation and 143 (34.1%) were referred to provincial government hospitals to undergo either the loop electrosurgical excision procedure/large loop excision of the transformation zone (n=109, 26.0%) or punch biopsy (n=34, 8.1%).

Conclusion: The influence of traditional Chiefs was leveraged to facilitate access to cervical cancer prevention services in rural Zambia.

KEYWORDS
African Chiefdoms; Cervical cancer prevention; Cervical cancer screening; Global cancer burden; Screen and treat; Village-based screening

1 | INTRODUCTION

The burden of invasive cervical cancer (ICC) is expected to double by 2030, resulting in 450 000 deaths worldwide each year.[1] Nine of every ten ICC-related deaths will occur in low-income and middle-income countries.[2] For example, the incidence of ICC among countries located in eastern and southern Africa (e.g., Zambia) is 58 per 100 000 women, with a mortality rate of 36.2 per 100 000 women.[3]

Infection with HIV potentiates the persistence of HPV infection, which is the obligate cause of ICC.[4] In Zambia, approximately one in every five reproductive-aged women is infected with HIV.[5] A modeling study estimated that 375 000 Zambian women are infected with HIV; of these women, 34 000 have high-grade cervical intraepithelial neoplasia 3 and 7300 have ICC.[6]

In response to the excessive burden of ICC, the Cervical Cancer Prevention Program in Zambia (CCPPZ)—a resource-appropriate, public-sector platform—was established in 2006.[7] The US President's Emergency Plan for AIDS Relief (acting via the Centers for Disease Control and Prevention) funded CCPPZ as its first prevention initiative focused on women infected with HIV. Local leadership for CCPPZ was provided by the Zambian Ministry of Health, with program operations managed by the Centre for Infectious Disease

Research in Zambia (a US–Zambian non-profit organization), in collaboration with the Department of Obstetrics and Gynecology at the University Teaching Hospital in Lusaka. This program offers a comprehensive approach to cervical cancer prevention at the population level by using trained nurses to provide screen-and-treat services on the same day, with ablation-ineligible women referred for further diagnostic evaluation and treatment. More than 500 000 Zambian women have been enrolled in CCPPZ since its inception. In February 2015, CCPPZ was integrated into the Zambian government's public-health infrastructure and a National Coordinator Cancer Prevention desk was established at the Ministry of Health.

Scale-up of CCPPZ has mainly concentrated on the capital city of Lusaka.[7] However, the National Cancer Control Strategic Plan of Zambia called for similar services to be implemented in rural areas of the country, where 60% of the population resides.[8–11] Severe human and infrastructure resource gaps have historically hindered the implementation of cervical cancer prevention services in rural Zambia, compounded by myths and misconceptions surrounding this disease and its treatment.[12] To overcome these barriers, local Chiefs (a traditional sector of Zambian civil society) were engaged to gain access to the target population.

The institution of Chieftaincy in Zambia dates back to the pre-colonial era. Traditional rulers (Chiefs) are regarded as supreme natural leaders of their respective communities. At present, there are 244 Chiefdoms in Zambia, each led by a Chief whose roles include safeguarding traditional values and customs; prescribing rules and regulations; and providing protection for the inhabitants of the villages within the Chiefdom,[13] including maintenance of their health and wellbeing.

When Zambia gained independence from colonial rule in 1965, the Constitution created the House of Chiefs as an advisory body to the government and a liaison between the government and the community. In 2011, the Ministry of Chiefs and Traditional Affairs (MOCTA) was established and given the responsibility of ensuring effective implementation of policies, plans, programs, and projects for their communities.. The health sector has a number of priorities that are supported through the House of Chiefs and MOCTA, including child health, HIV and AIDS, cultural health, mental health, and environmental health. As traditional rulers, Chiefs have a marked influence on their constituents, which can be used to facilitate education on critical health concerns. Leveraging this governance system was hypothesized to promote access to cervical cancer screening services among women living in remote resource-constrained regions of Zambia. This program involved the use of village-based screening (VBS).

The aim of the present study was to evaluate how the influence of traditional Chiefs was leveraged to promote access to cervical cancer prevention services via VBS in rural Zambia.

2 | MATERIALS AND METHODS

A retrospective review of outcome data was conducted for all screening outreach events that occurred in Zambian Chiefdoms between October 4, 2015, and October 3, 2016. Institutional Review Board approval was not indicated, as the present study was undertaken as an integral part of the Zambian government's scale-up of CCPPZ. All women gave informed consent before treatment.

The VBS program was initiated in March 2015. The process for implementation is summarized in Box 1. The VBS health promotion team first met with the MOCTA to explain the concept of cervical cancer prevention, elicit its support, acquire information related to the traditions and customs unique to the various Chiefdoms, and be assigned a designated liaison to the local Chiefs. The MOCTA-appointed liaison then contacted local Chiefs and arranged a meeting with the VBS health promotion team. After the meeting was arranged, the VBS team traveled to the various Chiefdoms and, in line with traditional customs, presented the local Chiefs with local commodities such as grains or other food products, as a show of gratitude and respect. They then explained the cervical cancer prevention program and its importance. Afterward, the local Chiefs assembled other village leaders, who also received information on cervical cancer and the VBS program, to encourage their support. Other influential stakeholders in the Chiefdoms were also visited, informed of the VBS program, and asked to serve as primary advocates and facilitators, including provincial and district health officials, medical officers, church leaders, traditional birth attendants, traditional marriage counselors, traditional healers, and community health workers.

Once support for the VBS program was established, the local Chiefs directed village leaders to summon all adults (women and men) in the villages of their Chiefdoms to attend cervical cancer prevention awareness talks by the VBS health promotion team. In addition to the mass meetings called by the village leaders, health education talks were given in various venues surrounding, and within, each Chiefdom, including churches, schools, health centers, and work sites. Announcements were made using a mobile public address system targeting strategic sites such as local markets and residential sectors. Radio interviews were conducted, coupled with continuous radio announcements detailing the scheduled cervical cancer screening event. All health promotion activities occurred during the week before the scheduled screening events, and were conducted in local languages.

The VBS program was then implemented over 6 days by a team comprising screening nurses, health promotions personnel, and local community health workers. Services were provided at local medical clinics or school buildings within the Chiefdoms, situated close to the largest catchment areas for the target population.

Screening was performed by nurses using visual inspection with acetic acid (VIA), enhanced with photography of the cervix using a hand-held digital camera as an adjunct. The digital photographs were first shown to the women and the findings discussed. They were then uploaded to a clinic computer, de-identified, and electronically transmitted to off-site experts using cellular telephone network lines for rapid distance consultation, when necessary.[14] Women with positive VIA test results were either treated immediately with cervical ablation using thermocoagulation (also called cold coagulation) or referred to the nearest provincial healthcare facility to undergo the loop electrosurgical excision procedure (LEEP)/large loop excision of the transformation zone (LLETZ) or punch

BOX 1 Summary of village-based screening events in Zambia.

Event	Details
Meeting with the Ministry of Chiefs and Traditional Affairs (MOCTA)	• Introduced the cervical cancer screening program • Learned about the Chiefdoms' traditions and customs • Meeting with local Chief facilitated by a MOCTA representative o Purpose: to gain support at the government level and to obtain a liaison to the Chiefdoms
Meeting with local Chiefs	• Presented the cervical cancer screening program and its benefits • Local Chiefs assembled village leaders for educational talks o Purpose: to gain additional support for the village-based screening program and to encourage them to serve as advocates and facilitators for the program
Village leaders, elders, and other relevant stakeholders (church leaders, traditional birth attendants, traditional marriage counsellors, traditional healers, and community health workers)	• Received an introduction to cervical cancer prevention • Served as advocates and facilitators for the program within the Chiefdom • Summoned men and women to participate during the outreach program o Purpose: to emphasize the importance of participating in the preventative services offered
Other influential stakeholders (provincial and district health officials, medical officers, and other clinicians)	• Received a formal introduction to the cervical cancer prevention program • Promoted cervical cancer prevention services o Purpose: to obtain additional and sustained support for the outreach program
Community sensitization	• Completed 1 wk prior the village-based screening event • Cervical cancer prevention educational talks provided throughout the Chiefdom and its surrounding community • Used public announcement system; local radio station interviews and announcements; community skits; and handouts and/or brochures in local languages • Targeted churches, markets, schools, health centers, and places of employment o Purpose: to increase awareness and improve participation in the outreach program
Village-based cervical cancer screening program	• Single-visit screen-and-treat model • Visual inspection with acetic acid followed by immediate ablative therapy (thermocoagulation) • Referral for lesions requiring biopsy or excision o Purpose: to screen and treat the largest possible number of women, while minimizing loss to follow-up
Programmatic evaluation	• Data and logistics were reviewed after each 1-wk outreach program • Continuous evaluation of successes and challenges o Purpose: to enable continued process improvements and ensure maximum benefit for women in rural regions of the country

biopsy. Histopathology results were followed up and managed by physicians at the local provincial hospital.

Data on the following screening outcome indicators were collected by the VBS nurses: the total number of women screened and treated, the number of VIA-positive test results, and the number of women referred after screening. The data were entered into a spreadsheet and reviewed using Excel 2017 version 16.11 (Microsoft, Redmond, WA, USA). Descriptive statistics were used for the current analysis.

3 | RESULTS

The VBS outreach events were implemented in 11 (4.5%) of the 244 Zambian Chiefdoms during the present study period. Complete data were available for ten VBS outreach events.

Approximately 10 000 women attended the cervical cancer prevention talks, 8399 (83.9%) of whom subsequently underwent screening. The mean number of women screened per event was 840 (range 392–1405). A total of 419 (4.9%) women had positive VIA test results. Of these 419 women, 276 (65.8%) were treated with same-day thermocoagulation. The remaining 143 (34.1%) women with VIA-positive test results were referred to the local provincial hospital to undergo either LEEP/LLETZ (n=109, 26.0%) or punch biopsy (n=34, 8.1%) owing to suspected cervical cancer.

4 | DISCUSSION

The present study showed that leveraging the governance system of Zambian Chiefs promoted access to a cervical cancer prevention service among rural African women, a high-risk population that is often

considered to be unreachable. To our knowledge, the VBS program was the first to make use of this particular traditional African social infrastructure for the purposes of cancer control.

Several features of the VBS program contributed to its successful implementation in rural Zambia. First, political will exercised by the government (MOCTA) and local Chiefs was translated into program support. Second, the influence of local Chiefs ensured that they successfully summoned their constituents to attend the VBS health talks. Third, adaptation of the cervical cancer screening platform to community circumstances allowed services to be offered in familiar physical structures located within the Chiefdoms. Finally, prior investment in the infrastructure required to perform LEEP/LLETZ in provincial Zambian hospitals facilitated the referral and management of women with complex cervical lesions that exceeded the therapeutic limitations of local ablation.

The VBS platform has screened thousands of Zambian women for cervical cancer; however, implementation of a program of this magnitude was not without challenges. First, lower than expected turnout was experienced at the time of VBS initiation, primarily owing to inadequate levels of community education. Health promotion activities were subsequently intensified by expanding the geographic target area within each of the Chiefdoms and increasing the amount of time spent educating local leaders. Second, screening services were also made available to women living in remote locations, as some had to travel long distances to access the services. This was accomplished by expanding prevention services to satellite centers within the Chiefdom and by using local vehicles to provide transportation. Third, dirt roads often became difficult to navigate during inclement weather (e.g. rainy season). Using vehicles equipped to operate under these conditions increased the ability to reach large numbers of women, as did choosing outreach dates that did not coincide with the rainy season or other seasons that could affect participation (e.g. planting and harvesting seasons).

Evaluation of the VBS program was limited by the available data among women referred for histologic evaluation (LEEP/LLETZ or punch biopsy) as it was difficult to retrieve information from the medical records departments of the referral hospitals. Efforts are currently underway to introduce a national electronic medical records system, which should improve access to such data in future analyses of the VBS program.

Implementation of the VBS program did not require building additional human capacity as it used human resources that already existed within CCPPZ and the provincial hospitals. The additional expense of screening in rural areas was absorbed by the Zambian Ministry of Health secondary to the integration of the VBS program into its system of public-health outreach services in January 2017. This feature increased the likelihood that the VBS program will be sustained. Other women-centered healthcare services are now under consideration for similar formats; for example, early detection of breast cancer, HPV vaccination, and other non-communicable disease prevention activities.

Traditional Chiefs might not exist or wield influence in other countries as they do in Zambia. Nevertheless, individuals with similar levels of respect such as village elders, local government officials, First Ladies, faith leaders, or other revered individuals within a community can serve as advocates to implement critical healthcare services.[15]

In summary, the VBS program represented a continuation of the philosophy of adaptive innovation which, in principle, incorporates respect for local beliefs and culture while integrating practical public-health solutions tailored to the target community. Healthcare leaders in low- and middle-income settings might consider using this approach to reach similar populations in their own countries. The VBS program could also be explored as a model to implement HPV-based cervical cancer screening.

AUTHOR CONTRIBUTIONS

SK, MM, SC, SCC, and GPP participated in designing, planning, and conducting the present study. SK, LFP, SCC, and GPP conducted the data analysis. All authors participated in manuscript development and writing.

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CONFLICTS OF INTEREST

The authors have no conflicts of interest.

REFERENCES

1. World Health Organization. Projections of mortality and causes of death, 2015 and 2030. 2016. https://www.who.int/healthinfo/global_burden_disease/projections2015_2030/en/. Accessed December 20, 2018.
2. Ferlay J, Shin HR, Bray F, Forman D, Mather C, Parkin DM. Estimates of worldwide burden of cancer in 2008: GLOBOCAN 2008. *Int J Cancer*. 2010;127:2893–2917.
3. International Agency for Research on Cancer, GLOBOCAN 2012: Estimated cancer incidence, mortality and prevalence worldwide in 2012. 2012. http://publications.iarc.fr/Databases/Iarc-Cancerbases/GLOBOCAN-2012-Estimated-Cancer-Incidence-Mortality-And-Prevalence-Worldwide-In-2012-V1.0-2012. Accessed December 20, 2018.
4. Denslow SA, Rositch AF, Firnhaber C, Ting J, Smith JS. Incidence and progression of cervical lesions in women with HIV: A systematic global review. *Int J STD AIDS*. 2014;25:163–177.
5. Bosch FX, Lorincz A, Muñoz N, Meijer CJ, Shah KV. The causal relation between human papillomavirus and cervical cancer. *J Clin Pathol*. 2002;55:244–265.
6. Bateman AC, Katundu K, Mwanahamuntu MH, et al. The burden of cervical pre-cancer and cancer in HIV positive women in Zambia: A modeling study. *BMC Cancer*. 2015;15:541.
7. Parham GP, Mwanahamuntu MH, Kapambwe S, et al. Population-level scale-up of cervical cancer prevention services in a low-resource setting: Development, implementation, and evaluation of the cervical cancer prevention program in Zambia. *PLoS ONE*. 2015;10:e0122169.

8. Central Statistic Office Zambia, Ministry of Health Zambia, ICF International. Zambia Demographic and Health Survey 2013–14. 2015. https://www.dhsprogram.com/pubs/pdf/fr304/fr304.pdf. Accessed December 20, 2018.
9. Seidenberg PD, Hamber DH, Iyer H, et al. Impact of integrated community case management on health-seeking behavior in rural Zambia. *Am J Trop Med Hyg*. 2012;87(5 Suppl):105–110.
10. Stringer JSA, Chisembele-Taylor A, Chibwesha CJ, et al. Protocol-driven primary care and community linkages to improve population health in rural Zambia: The Better Health Outcomes through Mentoring and Assessment (BHOMA) project. *BMC Health Serv Res*. 2013;13(Suppl 2):S7.
11. Shelley KD, Belete YW, Phiri SC, et al. Implementation of the community health assistant (cha) cadre in Zambia: A process evaluation to guide future scale-up decisions. *J Community Health*. 2016;41:398–408.
12. Chirwa S, Mwanahamuntu M, Kapabmbwe S, et al. Myths and misconceptions about cervical cancer among Zambian women: Rapid assessment by peer educators. *Glob Health Promot*. 2010;17(2 Suppl):47–50.
13. Chibomba S. The relevance of a house of chiefs in a democrartic society. A case study of Zambia. 2004. http://dspace.unza.zm:8080/xmlui/handle/123456789/2994. Accessed December 20, 2018.
14. Parham GP, Mwanahamuntu MH, Pfaendler KS, et al. eC3—a modern telecommunications matrix for cervical cancer prevention in Zambia. *J Low Genit Tract Dis*. 2010;14:167–173.
15. Kapambwe S, Parham G, Mwanahamuntu M, Chirwa S, Mwanza J, Amuyunzu-Nyamongo M. Innovative approaches to promoting cervical health and raising cervical cancer awareness by use of existing cultural structures in resource-limited countries: Experiences with traditional marriage counseling in Zambia. *Glob Health Promot*. 2013;20:57–64.