

Feasibility of Cervical Cancer Screening in Developing Countries: Editorial

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INTRODUCTION

Cervical cancer ranks among the leading causes of death worldwide [1]. Cervical cancer remains a significant global health challenge, with 570,000 new cases reported in 2018 and an age-standardized mortality rate of 6.9 per 100,000 [2]. As of 2020, there were approximately 604,000 new cases and 342,000 deaths from cervical cancer globally [3]. The burden of cervical cancer is not evenly distributed, with a disproportionately high incidence and mortality rate in low- and middle-income countries (85-90%) where access to healthcare, including screening and treatment, is limited [4,5]. Inadequate infrastructure, a lack of access to preventive HPV vaccines, screening, and treatment, as well as a shortage of trained professionals and training opportunities in these countries, impede efforts to reduce incidence and death [4]. Apart from deaths, cervical cancer can profoundly impact women's lives, leading to physical and emotional suffering and negatively affecting families and communities.

The primary cause of cervical cancer is persistent infection with high-risk types of Human Papillomavirus (HPV), mainly HPV-16 and HPV-

18 [6,7]. HPV is highly contagious and can be transmitted through skin-to-skin contact, including sexual intercourse [7]. It can also be passed from mother to child during childbirth. Other factors associated with an increased risk of cervical cancer include early sexual initiation, multiple sexual partners, smoking, a weakened immune system, and a family history of cervical cancer [8].

For primary prevention, HPV vaccines, such as Gardasil 9 and Cervarix, effective against the most common cancer-causing HPV types, are typically administered to adolescents before they become sexually active, providing long-lasting protection [9]. The use of condoms during sexual activity can also reduce the risk of HPV transmission and other sexually transmitted infections (STIs) [9,10].

However, condoms do not provide complete protection since HPV can infect areas not covered by condoms. In addition, education about safe sexual behavior, avoiding multiple sexual partners, and a healthy lifestyle lead to decreased risk of HPV infection and cervical cancer [11].

Screening is the most effective secondary prevention method to detect precancerous changes early, allowing for timely intervention and preventing the progression of precancerous lesions to cervical cancer [12–14]. Cervical cancer screening is performed using different tests, including Pap Smear (Cervical Cytology), which detects precancerous lesions. HPV testing is another test that can be used alone or in conjunction with Pap smears to identify high-risk

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HPV strains in cervical cells [12]. Additionally, Aptima HPV assay is a recent test used to detect specific RNA sequences of high-risk HPV types, and it is sensitive in detecting pre- and cancer cells [15].

Visual Inspection with Acetic Acid (VIA) is a low-cost visual inspection method that involves applying acetic acid to the cervix and looking for color changes that indicate abnormalities [16,17]. They are often used in resource-limited settings, and there is compelling evidence that cervical cancer screening with VIA, which happens to be the most cost-effective option when performed by public health workers, has been effective in lowering cervical cancer mortality rates in resource-limited settings [18].

If minor abnormalities, such as low-grade squamous intraepithelial lesions (LSIL) or low-risk HPV, are detected, close monitoring with repeat testing may be recommended, as these often resolve on their own [7,19]. However, if abnormalities persist, a colposcopy (visualization of the cervix with a special microscope) and biopsy may be performed to confirm the presence of precancerous or cancerous cells. This is followed by the treatment of precancerous lesions using various treatment modalities, such as cryotherapy, laser therapy, or surgical procedures (conization) to remove or destroy abnormal cells before they become cancerous [13,16].

Cervical Cancer Screening Challenges in Developing Countries

In many developing countries, organized cervical cancer screening programs are non-existent, with VIA being the only available option at primary healthcare levels. In some settings in these countries, Pap smears and HPV DNA testing are only accessible to a limited extent. Moreover, awareness levels are alarmingly low, contributing to reduced uptake of cervical cancer screening. Competing public health priorities such as maternal mortality, HIV-related deaths, and women's education can divert attention and resources away from cervical cancer screening in addition to inadequate health-seeking behavior among the population, reducing attendance rates for cervical cancer screening [20]. Furthermore, some aspects of cervical cancer screening, like cytology, still face challenges, including the unavailability of trained staff for interpreting cytology specimens

and performing office procedures like Loop Electrosurgical Excision Procedure (LEEP) and cryotherapy [17,20]. Most screening procedures are performed at primary and secondary hospitals, and transportation barriers hinder access to comprehensive cervical cancer screening services for some women in remote areas [20]. These cervical cancer screening procedures include Pap smears, HPV testing, and visual inspections like VIA [21,22]. Referrals to tertiary hospitals occur when abnormalities are detected, where advanced diagnostic tests, colposcopy, and treatments are available. Thus, transportation and economic constraints hinder the care progress for women in remote areas who cannot easily reach tertiary health facilities [20].

In certain countries, a "test and treat" strategy for cervical cancer is implemented, where cervical precancerous lesions are promptly treated with cryotherapy or conization, depending on the lesion type. However, in some regions, cultural factors, like consulting traditional healers, fear of results, and the fear of societal and marital rejection in case of a cervical cancer diagnosis, deter women from seeking screening [23]. Certain minority groups, such as South Asian populations, exhibit lower attendance to cervical cancer screening services than the general population, indicating that particular cultural factors might be involved [2]. Additionally, the shortage of healthcare providers trained in cervical cancer care and limited access to screening services pose substantial challenges [24]. This challenge is particularly prevalent in low-resource regions in developing countries, where limited access to screening and early detection often leads to delayed diagnoses and poorer outcomes. Insufficient capacity for cervical cancer surgery and palliative care, coupled with increased workloads for existing healthcare professionals, can lead to burnout and reduced quality of care [25]. Moreover, health disparities are exacerbated as underserved populations and rural areas in developing countries face greater difficulties in accessing cervical cancer care [26].

Approaches for enhancing cervical cancer screening

Nevertheless, there are promising opportunities and feasible approaches to enhance cervical cancer screening, including the use of telephone short message service (SMS) reminders and engaging

community health workers in sensitizing the population to attend cervical cancer screening have been demonstrated effective [2,24]. In South Africa, Moodley et al. [27] reported that SMS reminders for cervical cancer follow-up appointments were reported effective. Most participants (72%) desired to receive Pap smear results through SMS, and convenience, cost and time savings, and the benefit of saving time off work were all reasons for interest reported. Healthcare providers also stated that the SMS system would be more convenient for women and use resources more efficiently [27]. Furthermore, smartphone-based VIA enables cervical image preservation for patient education, health promotion, record-keeping, follow-up care, remote expert support, and quality control, improving VIA reliability and reproducibility while reducing hospital misdiagnoses and workload [13]. The presence of a family member or neighbor who has experience with cervical cancer or recommendations from community health workers can also encourage women to undergo screening [23]. In the United States of America (USA), the Boston Health Care for the Homeless program, which significantly increased cervical cancer screening rates among homeless women through a multifaceted approach focusing on shifting from scheduled appointments to patient-centric techniques, has also proven effective in screening [26]. This indicates that adapted interventions targeting specific populations have effectively increased cervical cancer screening rates [28,29]. Addressing the shortage of trained healthcare professionals necessitates expanding training programs, enhancing healthcare infrastructure, adopting telemedicine solutions, and increasing public health campaigns. Collaborative efforts and global partnerships are also crucial to combat cervical cancer effectively and improve outcomes

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for women worldwide. Strengthening primary healthcare is crucial to broadening access to screening and early interventions. This includes equipping primary healthcare facilities with the necessary infrastructures to perform advanced cervical cancer screening procedures and follow-up for patients with both precancerous lesions and malignant lesions [30]. In Rwanda, Muhimpundu et al. [30] reported that Rwanda's Screen, Notify, See, and Treat program, implemented in 2013, effectively utilized Rwanda's existing primary healthcare delivery systems and networks of community health workers and was effective in cervical cancer prevention by detecting HPV among 11.6% of screened patients, of whom, 89% underwent VIA discovering cancer lesions in 26.2%. These patients with cancerous lesions underwent treatment procedures, including hysterectomy, cryoablation, and biopsy [30].

In conclusion, addressing the low attendance in cervical cancer screening programs is critical, especially in developing countries. Feasible approaches include SMS reminders, targeted and culturally adapted interventions, training care providers, strengthening healthcare facilities, and engaging the community. Ministries of health and healthcare facilities, both public and private, should leverage these approaches to increase attendance and adherence to cervical cancer screening, ultimately contributing to the reduction of cervical cancer-related morbidity and mortality. Comprehensive strategies that include vaccination, screening, and education are vital in reducing the burden of cervical cancer and improving women's health worldwide. Increasing access to healthcare services and raising awareness about cervical cancer prevention are essential steps in addressing this disease's impact in the developing world.

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