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# Mass Screening of Human Papilloma Virus HPV: A New Cheaper Strategy

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**ABSTRACT**

Cervical cancer is a major health issue for women globally, with around 530,000 new cases and 275,000 deaths each year. The global incidence of cervical cancer varies widely, ranging from 7.5 cases per 100,000 to 75.9 cases per 100,000 women. Also, cervical cancer represents the largest share of these HPV-related cancers. HPV screening is a proven method for preventing the development of cervical cancer. The 2020 guidelines from the American Cancer Society outline several screening strategies. More studies are needed to use the cheaper screening strategy to confirm its effective and cost-effective particularity making it valuable for early diagnosis and treatment of cervical cancer especially in economically limited areas.

**Keywords:** Cervical Cancer Screening; Human Papillomavirus; Thin Prep Cytology Test; Cost-Effective; New Cheaper Screening Strategy; HPV Self-Sampling

## Introduction

In this editorial we comment on a new cheaper screening mass strategy of HPV. According to the authors of this article, the objective of presenting this study was to bring to attention of a new cheaper human papilloma virus mass screening strategy that may reduce cervical cancer incidence in Changsha city [1]. Cervical cancer is a major health issue for women globally, with around 530,000 new cases and 275,000 deaths each year [2]. The global incidence of cervical cancer varies widely, ranging from 7.5 cases per 100,000 to 75.9 cases per 100,000 women [2]. Approximately 630,000 new cancer cases worldwide are linked to human papillomavirus (HPV) infection, affecting the cervical and other reproductive tract areas. Cervical cancer represents the largest share of these HPV-related cancers [3]. Most HPV infections are temporary and resolve on their own; however, certain subtypes are considered high-risk for developing cancers. The high-risk HPV types include 16, 18, 31, 33, 35, 39, 45, 51, 52, 56, 58, 59 and 68. Additionally, there are medium-risk types, such as 26, 53, 66, 73 and 82 [4]. HPV infection rates were found to be 76% among women with low-grade cervical lesions and 85% among those with high-grade cervical lesions. Among cervical lesions and cervical cancer cases, the most common HPV types were 16, 18, 31, 33, 45, 52 and 58 [5]. China faces a significant burden of cervical cancer, with roughly 100,000 new cases each year, making up about 20% of the global total. Worryingly, there has been an increasing trend in the number of cases, particularly in rural regions, and a concerning shift towards younger age groups being diagnosed [6].

This trend is primarily due to the rising prevalence of HPV infections among younger populations. HPV screening is a proven method for preventing the development of cervical cancer. The 2020 guidelines from the American Cancer Society outline several screening strategies, with recommendations from reputable organizations such as the World Health Organization, the American Society of Vaginal and Cervical Pathology, and the European Organization for Research on Genital Infections and Tumors. The primary screening strategies include a combination of cytology and HPV screening, cytology screening alone, and HPV screening alone. The key recommendation is that women who are sexually active should begin screening at age 21. Women who have negative results for both cytology and high-risk HPV have a low cancer risk, and the recommended screening interval is every 3 to 5 years. If a woman tests negative for cytology but posi-

tive for HPV, her cancer risk is higher, and she should have a follow-up screening in one year. Women with atypical squamous cells of undetermined significance or higher, who are HPV-positive, or those with low-grade squamous intraepithelial lesions or higher, or positive for HPV types 16 or 18, should undergo colposcopy [7].

In the study by Zu YE et al. cervical cancer screening included a gynecological examination, vaginal secretion analysis, and HPV high-risk typing testing. Individuals who tested positive for HPV types other than 16 and 18 underwent cervical cytology examination (Thin Prep cytology test).

Vaginal colposcopy was performed for individuals positive for HPV types 16 and 18, as well as for those with positive Thin Prep cytology test results. If the vaginal colposcopy examination showed abnormal results, a histopathological examination was conducted. The study also included a cost-benefit analysis conducted after four years [1]. In the same study, Zu YE et al. found that from 2019 to 2022, a total of 523,437 women aged 35-64 years in Changsha city were screened, with 73,313 testing positive, resulting in a 14% positive rate. The detection rate for precancerous cervical lesions was 0.6%, while the detection rate for cervical cancer was 0.037%. Among 311,212 patients who underwent two rounds of screening, the incidence rate decreased by more than half in the second examination. The average cost per woman for screening was 120 RMB, and the average cost for detecting early cases was 10,619 RMB, resulting in an early detection cost coefficient of 0.083 [1]. Several studies have found that the highest infection rates were associated with HPV types 52, 58, and 16, while the highest carcinogenicity was linked to HPV types 16, 45, and 59 [8-10]. Since HPV59 is not covered by the nine-valent vaccine, it is important to pay greater attention to this subtype in HPV screening. In the study by Zu YE et al, the carcinogenic rate in women aged 60-65 years was 0.41%, compared to 0.04% in women aged 35-39 years. After the second screening, two women who tested positive for HPV16 and had invasive carcinoma were negative in the first screening.

This highlights the need for increased attention to cervical cancer screening for women aged 60-65 years who are infected with HPV16 [1]. Despite the availability of free screening, participation in HPV screening among women of the appropriate age is often limited due to factors such as cultural influences, education levels, public awareness, and individual beliefs [1]. To address this issue, studies have shown that HPV-based (vaginal) self-sampling (SS) offers several advantages, including convenience, reduced costs, and flexibility for women to collect samples either at home or in a healthcare setting. It also eliminates the need for a pelvic exam and avoids uncomfortable appointments with healthcare professionals, making it more socially and culturally acceptable. The implementation of self-sampling has gained significant momentum globally during the COVID-19 pandemic. In practical terms, social distancing, local lockdowns, clinic closures, and the reallocation of resources created challenges for traditional clinician-based screenings. Self-collection strategies have proven effective in overcoming these barriers, offering a flexible and viable alternative. Over time, robust data has accumulated on the reliability of specially designed self-sampling (SS) devices, along with optimized processes for sample preparation, transport, storage, and validated PCR-based HPV testing platforms tailored for self-collected specimens [11,12]. Studies have assessed knowledge and attitudes towards cervical cancer prevention across various populations, including healthcare providers [13].

Research on survival rates and associated factors has underscored the critical role of early diagnosis and preventive measures in cervical cancer. Gene expression profiling of peripheral blood mononuclear cells has revealed potential new markers for the disease, emphasizing its complex nature and the significant role of immune response genes [14]. Collectively, these studies deepen our understanding of cervical cancer etiology, offering valuable insights for prevention, diagnosis, and treatment strategies. However, further research is essential to fully unravel the complex interactions of factors that contribute to the development and progression of cervical cancer. Additionally, more studies are needed to use the screening strategy was by Zu YE et al. to confirm its effective and cost-effective particularity making it valuable for early diagnosis and treatment of cervical cancer especially in economically limited areas.

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