Interpretation and Discussion of the Royal Australian College of General Practitioners' "Guidelines for Preventive Activities in General Practice": Post-print on Preventive Activities for Human Papillomavirus Infection

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Abstract

Globally, cervical cancer is a major health concern threatening women' s well-being. Preventive services for cervical cancer and female reproductive system diseases are important themes in primary healthcare and general practice services. Persistent human papillomavirus (HPV) infection is the primary causative factor of cervical cancer. Cervical cancer is a preventable tumor, and preventing HPV infection can reduce its incidence. This article will interpret and discuss the HPV infection prevention activities recommended in the tenth edition of the "Guidelines for Preventive Activities in General Practice" proposed by the Royal Australian College of General Practitioners (RACGP), and conduct a comparative analysis of the series of measures implemented in China for the prevention and control of HPV infection and cervical cancer. By referencing Australian general practice guidelines and practices, it is proposed that in China' s subsequent action plans to eliminate cervical cancer, it is necessary to strengthen the intervention intensity of primary healthcare and general practice. Furthermore, further research and the accumulation of more extensive evidence are required in areas such as improving HPV vaccine acceptance, promoting vaccination among male adolescents, and implementing self-collected sample testing. This will facilitate the continuous adjustment and optimization of prevention and control strategies for cervical cancer.

Full Text

Preamble

Interpretation and Discussion of the Royal Australian College of General Practitioners' *Guidelines for Preventive Activities in General Practice*: Preventive Activities for Human Papillomavirus Infection

1 Introduction

Human Papillomavirus (HPV) is a common group of viruses that can lead to various cancers and benign lesions, most notably cervical cancer, oropharyngeal cancer, and genital warts. As primary care providers, general practitioners (GPs) play a critical role in the prevention, screening, and early detection of HPV-related diseases. The Royal Australian College of General Practitioners (RACGP) provides comprehensive recommendations in its *Guidelines for Preventive Activities in General Practice* (often referred to as the "Red Book"). This article interprets these guidelines specifically regarding HPV prevention and discusses their implications for clinical practice.

2 Primary Prevention: HPV Vaccination

The cornerstone of HPV prevention is vaccination. The RACGP guidelines emphasize that vaccination is most effective when administered prior to the onset of sexual activity.

2.1 Target Populations and Timing The guidelines recommend routine HPV vaccination for adolescents. In Australia, the National Immunisation Program (NIP) typically targets children aged 12–13 years through school-based programs. However, the RACGP highlights that "catch-up" vaccinations are highly effective for older adolescents and young adults who were not vaccinated at the recommended age.

2.2 Vaccine Efficacy and Safety Current evidence supports the use of the 9-valent HPV vaccine, which protects against the high-risk types responsible for the majority of cervical cancers (Types 16, 18, 31, 33, 45, 52, and 58) and types that cause genital warts (Types 6 and 11). The guidelines reinforce that the vaccine is safe and has led to a significant reduction in the prevalence of vaccine-type HPV infections and related clinical outcomes.

3 Secondary Prevention: Cervical Screening

While vaccination significantly reduces risk, it does not eliminate it entirely. Therefore, secondary prevention through regular screening remains essential for women and people with a cervix.

3.1 Transition to HPV-Based Screening Australia has transitioned from the conventional Pap smear (cytology-based) to a more sensitive primary HPV test. The RACGP guidelines align with the National Cervical Screening Program (NCSP), recommending that screening begin at age 25 and continue every five years until age 70–74, provided the

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Interpretation and Discussion of the RACGP Guidelines for Preventive Activities in General Practice: Prevention and Control Strategies for Human Papillomavirus Infection

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Abstract: Globally, cervical cancer remains a major threat to women' s health. Preventive services for cervical cancer and diseases of the female reproductive system are critical themes within primary healthcare and general practice. Persistent infection with Human Papillomavirus (HPV) is the primary causative factor for cervical cancer. As a preventable malignancy, reducing the incidence of cervical cancer can be achieved by preventing HPV infection. This article interprets and discusses the recommendations for HPV prevention activities proposed in the 10th edition of the *Guidelines for Preventive Activities in General Practice* by the Royal Australian College of General Practitioners (RACGP). Furthermore, it provides a comparative analysis of the various measures implemented in China for the prevention and control of HPV infection and cervical cancer. By referencing Australian general practice guidelines and clinical experiences, this paper suggests that China' s subsequent action plans to eliminate cervical cancer should strengthen interventions within primary care and general practice. Additionally, further research and the accumulation of robust evidence are required in areas such as improving HPV vaccine acceptance, promoting vaccination among male adolescents, and implementing self-sampling for screening. Such efforts will facilitate the continuous adjustment and optimization of cervical cancer prevention and control strategies.

Keywords: Cervical cancer; Human Papillomavirus; Vaccination; Screening; General practice

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Globally, cervical cancer is a significant health challenge for women. Preventive services targeting cervical cancer and related reproductive system disorders represent a core component of primary healthcare and general practice. It is well-established that persistent infection with high-risk types of Human Papillomavirus (HPV) is the leading cause of cervical cancer. Because cervical cancer

is a preventable disease, effective prevention of HPV infection directly leads to a reduction in its incidence.

This article focuses on the 10th edition of the *Guidelines for Preventive Activities in General Practice* published by the Royal Australian College of General Practitioners (RACGP). We interpret the specific HPV prevention activities recommended in these guidelines and compare them with the current strategies employed in China. Australia has been a global leader in cervical cancer prevention, and its integrated approach provides valuable insights for other nations.

By analyzing the Australian framework, we propose that China's future "Action Plan to Eliminate Cervical Cancer" should place a greater emphasis on the role of primary care providers and general practitioners. Specifically, there is a need for targeted interventions to increase HPV vaccine uptake and public acceptance. Furthermore, exploring the expansion of vaccination programs to include male adolescents and the promotion of HPV self-sampling technologies are critical steps. These initiatives require further localized research and the accumulation of clinical evidence to ensure that prevention and control strategies are evidence-based and optimized for the Chinese context.

Abstract

Cervical cancer represents a substantial global health issue that adversely affects the well-being of women.

The provision of preventive services for cervical cancer and diseases of the female reproductive system represents a crucial component of primary healthcare and general medical practice. Persistent infection with human papillomavirus (HPV) has been identified as the primary etiological factor in the development of cervical cancer. Being a preventable malignancy, cervical cancer can have its incidence substantially reduced through the effective prevention of HPV infection. This article seeks to analyze and evaluate the strategies for preventing HPV infection as outlined in the 10th edition of the Royal Australian College of General Practitioners (RACGP) Guidelines, specifically regarding their implementation in China for the prevention and control of HPV infection and cervical cancer. Drawing on established guidelines and practices from Australia, it is advisable that the upcoming cervical cancer elimination program in China should prioritize strengthening intervention efforts within primary healthcare and general practice. Furthermore, it is imperative to conduct additional research to optimize these strategies.

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Chinese General Practice research and gather more robust evidence in domains such as enhancing the acceptance of HPV vaccines, encouraging vaccination among male adolescents, and implementing self-collected sample testing. The ultimate aim is to enable the ongoing refinement and enhancement of strategies for the prevention and management of cervical cancer.

Key words: cervical cancer; Human papillomavirus viruses; vaccination; screening; General practice

Cervical cancer is the fourth most common malignancy among women worldwide. Persistent infection with human papillomavirus (HPV) is one of the primary pathogenic factors for cervical cancer. As a preventable tumor, the prevention of HPV infection plays a vital role in reducing the incidence of cervical cancer.

The incidence of cervical cancer exhibits regional variations and is correlated with the level of economic development. Africa has the highest incidence rate, while the rate in Asia is half that of Africa (12.7 per 100,000 women). Europe and the United States have the lowest incidence rates, approximately half of those in Asia. The high incidence and mortality rates of cervical cancer in low- and middle-income countries may be related to inequalities in access to services such as HPV vaccination, cervical cancer screening, and treatment caused by social and economic factors. Previous studies have shown that cervical cancer can be eliminated early through highly accessible public health services, high HPV vaccination rates, and high-quality screening. Through HPV vaccination and regular screening, cervical cancer is both preventable and treatable. Countries worldwide are making efforts to accelerate the elimination of cervical cancer under the guidance of the WHO' s "90-70-90" targets. Specifically, these targets are: 90% of girls fully vaccinated with the HPV vaccine by age 15; 70% of women screened for cervical cancer between ages 35 and 45; and 90% of women with precancerous lesions or invasive cervical cancer receiving appropriate treatment. In most countries, cervical cancer prevention activities are undertaken by primary care and general practice service systems. The 10th edition of the *Guidelines for Preventive Activities in General Practice* (hereinafter referred to as the "Red Book"), published by the Royal Australian College of General Practitioners (RACGP), provides professional recommendations for general practitioners (GPs) on HPV vaccination activities based on existing scientific evidence and implementation experience. This article will interpret and discuss the HPV infection prevention activities recommended in the "Red Book," compare and analyze the series of measures implemented in China for HPV infection and cervical cancer prevention and control, and propose adjustments and optimizations for China' s subsequent cervical cancer elimination action plans.

Recommendations for Cervical Cancer Prevention in the "Red Book"

The "Red Book" recommendations for HPV screening: Individuals aged 25–74 who have a history of sexual activity and meet screening criteria (including women and transgender men with a cervix) should participate in cervical HPV screening every five years. Screening methods can involve either self-collected vaginal samples or clinician-collected samples. Women aged 70–74 who have a negative oncogenic HPV test result do not need to continue participating in HPV screening. The "Red Book" strongly recommends HPV immunization for adolescents and young adults aged 9–25. Australia' s specific "90-70-90" goals for cervical cancer elimination (90% vaccination, 70% screening, 90% treatment) are:

By 2030, 90% of girls will be fully vaccinated against HPV by age 15; 70% of women will receive high-performance HPV screening by age 35 and again by age 45; and 90% of women diagnosed with cervical cancer will receive treatment.

GPs play an important role in achieving these goals by providing vaccinations and encouraging women to participate in cervical cancer screening programs to ensure early detection. In Australia, both HPV vaccination activities and HPV/cervical cancer screening programs are free of charge, funded by the National Immunisation Program, specialized screening programs, and Medicare.

Interpretation of the "Red Book" Recommendations for Cervical Cancer Prevention

In Australia, cervical cancer is the 13th most common cancer among women. In vulnerable communities and groups (Aboriginal and Torres Strait Islander peoples), the incidence of cervical cancer is significantly higher than in other populations. Australia reported 942 new diagnostic cases in 2022 (7.1 per 100,000 women); in 2023, 265 people died from cervical cancer in Australia. It is estimated that by 2025, the risk of a woman dying from cervical cancer by age 85 will be 1 in 688 (or 0.15%). HPV is a common sexually transmitted pathogen, and its infection can affect the skin, genitals, anus, and throat. Almost all sexually active individuals will be infected with HPV; in most cases, the human immune system clears the virus, and over 90% of HPV infections resolve spontaneously within 1–2 years, usually without symptoms. Persistent HPV infection of the cervix may lead to precancerous lesions. Among these, 1% to 4% will progress to cervical intraepithelial neoplasia (CIN) or cancer, though 10% of women will experience persistent infection [**?**]. The transformation of abnormal cells into cancer typically takes 15 to 20 years. For women with weakened immune systems, such as untreated HIV patients, this process may be faster, taking only 5 to 10 years. More than 90% of cervical cancers are caused by HPV infection, with over 85% caused by high-risk HPV types (primarily types 16 and 18). Among the more than 200 identified HPV types, 40 can infect the reproductive system, and 13 are high-risk oncogenic types, including 16, 18, 31, 33, 35, 39, 45, 51, 52, 56, 58, and 59. HPV-16 is the most oncogenic, with over 60%

of cervical squamous cell carcinomas, adenocarcinomas, oropharyngeal cancers, and other genital cancers associated with HPV-16 infection. The persistence and progression of HPV infection are closely related to individual immune status in addition to the HPV type. HIV-positive women, patients with acquired immunodeficiency syndrome (AIDS), and organ transplant recipients belong to high-risk groups.

Furthermore, the presence of other sexually transmitted infections (such as *Chlamydia trachomatis*), parity, age at first pregnancy, use of oral contraceptives, smoking, obesity, and severe mental illness are also considered to be associated with the persistence and progression of HPV infection.

Screening refers to regular examinations conducted on asymptomatic "healthy" individuals to detect problems early and implement targeted management and treatment measures. The WHO recommends HPV-DNA testing as the preferred screening method for cervical cancer, while HPV-mRNA testing can also be used. HPV screening is a critical measure for the early detection of cervical cancer. In addition to complying with the WHO' s ten principles of screening, particular emphasis is placed on the feasibility of implementation. The "Red Book"suggests that women can visit a general practice clinic to have a clinician or nurse collect a cervical sample, or they can collect the sample themselves at home. This significantly removes barriers to screening and improves participation rates. The "Red Book" emphasizes that GPs should ensure women receive clear information and have a full understanding of HPV screening, including the relationship between HPV and cervical cancer, the likelihood of HPV being detected, and the necessary follow-up treatments if HPV is detected. If a woman chooses self-collection at home, general practice staff should provide information on how to collect the sample (such as online instructional videos or written materials) and how to obtain the test results. For women who self-collect, the GP should issue the pathology request and track the self-sampling and submission process.

If a woman' s initial screening identifies oncogenic HPV, the "Red Book" recommends follow-up HPV testing. Although follow-up HPV testing can be performed via either clinician collection or self-collection, GPs should inform women that clinician collection allows for concurrent liquid-based cytology (LBC), eliminating the need for self-collecting women to return to the clinic for LBC. Similarly, GPs should inform women of the possible results of follow-up HPV testing and LBC, as well as the treatment measures required in the event of a positive result.

The "Red Book" also provides clear recommendations regarding cervical screening for pregnant women. Prenatal and postnatal care services provided by GPs should include an assessment of cervical cancer screening history. For pregnant or postpartum women who are due or overdue for screening according to the regular schedule, screening tests should be provided. Screening is safe at any stage of pregnancy, provided the correct sampling tools are used. During sampling, the cervical brush should not be inserted into the cervical canal to prevent the risk of bleeding or avoid discomfort for the pregnant woman. All pregnant

women may choose between clinician collection or self-collection, but the GP should inform them in advance that there may be a small amount of bleeding during sampling. If a pregnant woman' s self-collected sample is HPV-positive (non-16/18 types), she should be recalled for further examination, such as LBC.

As seen above, in cases where there is sufficient evidence that the benefits of HPV screening clearly outweigh the harms, the "Red Book" focuses more on how to ensure screening is implemented effectively and allows women to choose a sampling method based on their own circumstances. The "Red Book"places great emphasis on information disclosure regarding screening and follow-up activities.

According to the WHO strategy for eliminating cervical cancer, raising public awareness, enhancing health literacy, and improving access to information and services are essential for prevention and control efforts throughout the life course. The "Red Book" strongly recommends HPV immunization for adolescents and young adults aged 9–25. The primary strategy involves vaccinating all male and female students aged 14–16 with the 9-valent HPV vaccine through the school-based National Immunisation Program. Generally, a single dose of the HPV vaccine is recommended; for immunocompromised adolescents and adults, a three-dose schedule is advised. For those who did not participate in the school-based HPV vaccination program, the maximum age for catch-up vaccination is 25. HPV vaccination is generally not recommended for adults aged 26 and older; however, since the vaccine may offer uncertain benefits to some adults who may be infected with HPV or are at risk of further exposure, it is not routinely recommended for this group. For women under 25, there is a lack of supporting evidence for cervical cancer screening regardless of sexual activity (i.e., screening is not recommended for women under 25).

However, from a general practice perspective, for women who had their first sexual encounter before age 14 and were not vaccinated against HPV prior to sexual activity, GPs may consider administering one dose of the HPV vaccine between ages 20 and 24, though it should not be mandatory.

HPV vaccination is a success story for Australia' s infectious disease prevention programs. In 2007, Australia became the first country in the world to implement a national HPV vaccination program covering all female adolescents, and in 2013, the program was expanded to include all male adolescents. Australia promotes HPV vaccination using schools as the primary vaccination sites.

Although the "Red Book" mentions 9–25 as the vaccination age range, the concentrated age for vaccination is 12–13, corresponding to Year 7 students in Australia. If this window is missed, catch-up vaccination can be performed before age 26 (up to age 25). The specific procedure is as follows:

The HPV vaccine is provided free of charge to students through the National Immunisation Program. Before vaccination, parents and guardians receive information and consent forms. Immunization teams visit schools to administer the vaccine during school hours. Those who miss the school-based vaccination can receive it for free at a GP clinic or pharmacy. In Australia, school-based

immunization activities are not necessarily performed by GPs but are primarily implemented by immunization nurses (Registered Nurses) employed and trained by local governments or state health departments. This is related to the fact that Australian GPs are private practitioners. In this context, GPs play a role in providing catch-up vaccinations and alternative pathways for students who were unable to participate in the school-based immunization program.

3 全科医学宫颈癌预防活动的讨论

From 2005 to 2020, cervical cancer rose from the 7th to the 6th leading cause of cancer-related deaths among adult women in China. It currently ranks as the 3rd leading cause of cancer-related mortality among women aged 20–39. Furthermore, the number of deaths across all age groups has increased by an average of 2.72% annually, making it a significant public health concern that warrants urgent attention.

China' s "Action Plan to Accelerate the Elimination of Cervical Cancer (2023–2030)" has established phased goals for elimination. Specifically, by 2025, the plan aims to pilot the promotion of HPV vaccination services for eligible girls, achieve a cervical cancer screening rate of 50% among eligible women, and reach a 90% treatment rate for patients with cervical cancer and precancerous lesions. By 2030, the plan intends to continuously advance the HPV vaccination pilot programs for eligible girls, increase the screening rate for eligible women to 70%, and maintain a 90% treatment rate for affected patients. Currently, HPV vaccination services have gradually commenced and are progressing steadily nationwide.

Regarding cervical cancer screening in China, the government initiated cancer screening programs targeting rural areas across 31 provinces, autonomous regions, and municipalities as early as 2005. In 2009, China launched the "Two Cancers Screening" program, specifically targeting cervical and breast cancer for women aged 35–64 in rural areas. Although at least 100 million cervical cancer screenings were conducted over the following three years, the national screening coverage rate reached only 36.8% during the 2018–2019 period. Consequently, since 2019, "Two Cancers Screening" has been integrated into the scope of basic public health services, leading to the comprehensive expansion of cervical cancer screening across mainland China. In 2022, high-risk HPV (HR-HPV) testing was officially incorporated into the national "Two Cancers Screening" program. Leveraging the National Cancer Screening Programmes (NCSP), local hospitals and Centers for Disease Control and Prevention (CDCs) provide free cervical cancer screening services to local residents. The costs of these screenings are fully borne by the government, with no out-of-pocket expenses for individuals. However, national-level cancer screenings typically provide one-time screenings, selecting previously unscreened populations for each round to maximize coverage.

Based on the epidemiological status of cervical cancer in China, the "Chinese

Guidelines for Cervical Cancer Screening (I)" (hereinafter referred to as the "Guidelines") recommend the following HPV screening protocols. Since HPV testing and cervical cytology complement each other as essential components of cervical cancer screening, this article follows the Guidelines' recommendations and discusses them collectively rather than in isolation. The Guidelines provide specific screening recommendations for the general population, special populations (such as high-risk women under 25 and pregnant women), women post-hysterectomy, immunocompromised individuals, and those who have received prophylactic HPV vaccines.

For the general population, the recommended starting age for screening is 25. For women aged 25–64, it is suggested to undergo either a standalone HPV nucleic acid test or a co-test (HPV plus cervical cytology) every five years, or a cytology test alone every three years. Regarding the upper age limit for screening, the Guidelines offer specific advice for women over 65. Screening may be discontinued for women over 65 who have a documented history of adequate negative screening results, no persistent HPV infection, and no history of treatment for CIN or other HPV-related diseases. If these criteria are not met, cervical cancer screening should continue. For high-risk women under 25, screening is recommended within one year of becoming sexually active. For individuals who have received prophylactic HPV vaccines, the Guidelines suggest following the same screening strategy as the general population. This is because prophylactic vaccines do not cover all high-risk HPV types and cannot prevent infection from all strains. However, the Guidelines also note that as HPV vaccination becomes more widespread, further evidence-based research will be required to refine screening intervals and methods for vaccinated populations.

Regarding screening modalities, the "Chinese Guidelines for Cervical Cancer Screening (II)" recommend HR-HPV nucleic acid testing as the preferred primary screening method. This should utilize HPV nucleic acid testing methods and reagents that are clinically validated for primary screening and recognized by authoritative domestic and international organizations. In regions where HR-HPV testing is unavailable, cytology may be used, with a transition to HR-HPV-based methods as conditions mature. Co-testing with HR-HPV and cytology is reserved for regions with sufficient medical resources, opportunistic screening populations, and certain special groups. Primary detection methods used in China, such as HPV-DNA testing, HR-HPV nucleic acid testing, and cervical cytology (e.g., ThinPrep Cytologic Test/Liquid-based Cytologic Test, TCT/LCT), are feasible within general practice settings. Advances in precision screening technologies—such as DNA methylation classification, HPV integration detection, liquid biopsy, and AI-assisted diagnosis—have addressed the limitations of traditional methods. When necessary, patients can be referred to specialists for precision screening. In summary, current treatment strategies for eradicating HPV infection and managing HPV-induced precancerous lesions are well-established and serve as key measures in preventing the disease.

In China, HPV and cervical cancer screening are primarily conducted by spe-

cialized obstetrics and gynecology departments and the preventive healthcare departments of primary healthcare institutions. Under the framework of basic public health services, preventive healthcare departments provide annual free cervical cancer screening to local residents. Specialized obstetrics and gynecology departments are mainly responsible for the diagnosis and treatment of patients referred from primary healthcare institutions, as well as for screening and treating individuals who seek care proactively. Notably, self-collected HPV samples have been proven to be as reliable as those collected by healthcare professionals. While not yet fully implemented across China, self-sampling is likely to become a future trend.

Cervical Cancer Prevention Measures in China

3.3.1 HPV 疫苗接种

In November 2025, seven Chinese government departments, including the National Disease Control and Prevention Administration and the National Health Commission, issued the "Notice on Matters Related to the Inclusion of the Human Papillomavirus (HPV) Vaccine into the National Immunization Program." This marks the official entry of the HPV vaccine into the national immunization framework, initiating free vaccinations for specific populations.

The specific measures are as follows: nationwide, under the principle of "informed and voluntary" consent, girls born after November 10, 2011, who have reached the age of 13, will receive two free doses of the domestic bivalent (HPV types 16/18) vaccine, with a 6-month interval between doses. Girls who have already completed a full course of other HPV vaccines (such as quadrivalent or nonavalent) at their own expense do not need to receive the immunization program vaccine. Currently, the HPV vaccines available in China include the bivalent (16, 18) vaccine, which prevents cervical lesions and cervical cancer, as well as the quadrivalent (6, 11, 16, 18) and nonavalent (6, 11, 16, 18, 31, 33,

45, 52, 58) vaccines, which prevent genital warts and related malignancies caused by various HPV subtype infections. According to the *Guidelines for Human Papillomavirus Vaccination in Children and Adolescents (2025)* (hereinafter referred to as the "Vaccination Guidelines"), the recommendations for HPV vaccination are as follows. The "Vaccination Guidelines" provide specific advice regarding vaccine selection (bivalent, quadrivalent, or nonavalent), vaccination age, dosage and interval recommendations, special populations (children and adolescents with impaired immune function), and follow-up vaccination after dose interruption. Routine HPV vaccination is recommended for both male and female children and adolescents aged 9–14 years; for those who were not vaccinated before age 14, vaccination should be completed by age 26 (Recommendation Level: Grade A). In national or provincial immunization program documents, the routine vaccination age is typically 11–13 years, with the upper age limit for catch-up vaccination ranging from 17 to 26 years. Recommendations from academic institutions are largely consistent with the WHO position

paper: girls aged 9–14 are the primary target group, with expansion to boys or older females when resources are sufficient. Vaccination for adult women aged $\geq$ 26 has limited cost-effectiveness, and individual-based vaccination is recommended. Latest information can typically be found by searching for "HPV vaccine" or "cervical cancer vaccine" on the official websites or WeChat public accounts of local district/county Health Commissions and Centers for Disease Control and Prevention (CDCs). Since the target population consists primarily of students, some schools will forward specific vaccination schedules; therefore, school notices should also be monitored. HPV vaccination efforts in China are primarily undertaken by the preventive healthcare departments of primary medical and health institutions and CDCs, ensuring high accessibility.

3.3.2 其他方法

Other significant methods for preventing HPV infection and reducing the risk of cervical cancer include abstaining from smoking or quitting smoking, and the consistent use of condoms. Additionally, men may voluntarily choose to undergo circumcision as a preventive measure.

4 拓展

Cervical precancerous lesions refer histologically to high-grade squamous intraepithelial lesions (HSIL), cervical intraepithelial neoplasia grade 3 (CIN3), and adenocarcinoma in situ (AIS). If left untreated, these conditions may progress to invasive cancer.

Once precancerous lesions are identified, timely treatment can effectively prevent the development of cervical cancer. If diagnosed and treated at an early stage, cervical cancer is highly curable. The implementation of repeated cytological examinations, colposcopy-guided biopsies, and surgical excision of precancerous lesions has reduced the population-level incidence and mortality of cervical cancer by 60% to 80%. Treatment can be administered during the same clinical visit (the "see-and-treat" approach) or following a secondary evaluative procedure (the "screen-triage-and-treat" approach).

The choice between these two approaches should be determined through shared decision-making between the physician and the patient, taking into account the patient' s specific circumstances and the accessibility of local medical resources. Within the framework of general practice management, once cervical precancerous lesions are identified, facilities lacking the necessary treatment capabilities should refer the patient to a specialized gynecology department for further diagnosis and management.

5 展望

Australia' s HPV immunization program has significantly reduced the incidence of HPV infection, genital warts, and precancerous cervical lesions. Notably,

in 2021, there were zero reported cases of cervical cancer among young women under the age of 25. these results demonstrate that Australia's HPV vaccination initiative has achieved substantial public health outcomes in disease prevention and control.

China is currently accelerating the implementation of nationwide HPV screening and vaccination programs; however, several challenges remain for successful execution. First, despite the vast population of potential beneficiaries, the level of HPV vaccine acceptance will directly impact overall coverage rates. Second, cervical cancer screening and HPV vaccination in China are currently integrated into basic medical and health services, primarily managed by specialized preventive healthcare or gynecology departments. It is worth discussing how to integrate these efforts with general practice services, conduct feasibility studies on HPV vaccination and cervical cancer screening within primary care, and develop specific Chinese general practice guidelines for these interventions. Future research should focus on: (1) the epidemiological characteristics of HPV infection among Chinese women; (2) the feasibility of implementing comprehensive school-based HPV immunization programs for both male and female adolescents; and (3) primary care implementation strategies for HPV and cervical cancer screening among eligible populations, including the feasibility of concurrent self-sampling and clinician-collected sampling methods.

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Note: Figure translations are in progress. See original paper for figures.