



A Policy Review for the National Cervical Cancer Elimination Plan as the Primary Prevention of Cervical Cancer in Indonesia: Perspective on HPV Vaccination Recommendations from the Centers for Disease Control and Prevention

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ABSTRACT

Introduction: Cervical cancer is the second most prevalent cancer among women in Indonesia and ranks third globally. It accounts for 7.5% of cancer-related deaths worldwide, with a notable impact in developing nations like Indonesia. The primary cause is high-risk Human Papillomavirus (HPV); however, the risk can be lowered through vaccination. This review aims to evaluate Indonesia's policy for implementing a national HPV vaccination program targeting school-aged children and assess its conformity with CDC guidelines. **Methods:** The study involved an extensive review of literature, as well as international and Indonesian policy documents. **Results:** The CDC recommends HPV vaccination for individuals aged 9–26, ideally beginning at 11 or 12 years old. In line with this, Indonesia has included the HPV vaccine in its national immunization schedule. The Indonesian Ministry of Health intends to require HPV vaccination for school-aged children, aiming for full national implementation by 2023. This reflects Indonesia's strong commitment to a comprehensive cervical cancer prevention strategy. The policy's alignment with CDC recommendations emphasizes the country's dedication to primary prevention through HPV vaccination. **Conclusion:** By enforcing HPV vaccination for school-aged children, Indonesia aims to substantially decrease the incidence and mortality rates associated with cervical cancer. This policy represents a significant advance in the fight against cervical cancer in Indonesia and could serve as a model for other countries contending with similar public health issues.

Keywords: Cervical cancer, HPV (Human Papillomavirus), Indonesia, national policy, vaccination.

ABSTRAK

Pendahuluan: Kanker serviks merupakan kanker kedua yang paling banyak terjadi pada wanita di Indonesia dan menduduki peringkat ketiga di dunia. Penyakit ini menyumbang 7,5% dari kematian terkait kanker di seluruh dunia, dengan dampak signifikan di negara-negara berkembang seperti Indonesia. Penyebab utamanya adalah *Human Papillomavirus* (HPV) berisiko tinggi; namun, risikonya dapat dikurangi melalui vaksinasi. Tinjauan ini bertujuan untuk mengevaluasi kebijakan Indonesia terkait pelaksanaan program vaksinasi HPV nasional yang ditujukan untuk anak-anak usia sekolah, dengan menilai kesesuaiannya dengan pedoman CDC. **Metode:** Studi ini melibatkan tinjauan literatur serta dokumen kebijakan internasional dan Indonesia. **Hasil:** CDC merekomendasikan vaksinasi HPV untuk individu berusia 9 hingga 26 tahun, dengan usia ideal dimulai pada 11 atau 12 tahun. Sejalan dengan itu, Indonesia telah memasukkan vaksin HPV ke dalam jadwal imunisasi nasional. Kementerian Kesehatan Indonesia bermaksud untuk mewajibkan vaksinasi HPV bagi anak-anak usia sekolah, dengan target implementasi penuh secara nasional pada tahun 2023. Hal ini mencerminkan komitmen kuat Indonesia terhadap strategi komprehensif untuk pencegahan kanker serviks. Keselarasan kebijakan ini dengan rekomendasi CDC menekankan dedikasi negara dalam pencegahan primer melalui vaksinasi HPV. **Simpulan:** Dengan mewajibkan vaksinasi HPV bagi anak-anak usia sekolah, Indonesia bertujuan untuk secara signifikan menurunkan angka kejadian dan kematian yang terkait dengan kanker serviks. Kebijakan ini merupakan langkah maju yang penting dalam memerangi kanker serviks di Indonesia dan dapat menjadi model bagi negara-negara lain yang menghadapi masalah kesehatan masyarakat serupa. **Fitriyadi Kusuma, Kemal Akbar Suryoadji. Tinjauan Kebijakan pada Rencana Aksi Nasional Eliminasi Kanker Leher Rahim sebagai Pencegahan Primer Kanker Serviks di Indonesia: Perspektif Vaksinasi HPV berdasarkan Rekomendasi Pusat Pengendalian dan Pencegahan Penyakit.**

Kata Kunci: Kanker serviks, HPV (*Human Papillomavirus*), Indonesia, kebijakan nasional, vaksinasi.



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INTRODUCTION

Cervical cancer is one of the leading causes of cancer-related deaths among women globally, ranking as the third most common cancer in women and accounting for 7.5% of all female cancer deaths. In Indonesia, cervical cancer holds an even more alarming position, as the second most prevalent cancer among women. The burden of cervical cancer disproportionately affects developing countries, with over 85% of new cases and related deaths occurring in low- and middle-income regions, including Indonesia. The majority of these cases are caused by high-risk strains of the Human Papillomavirus (HPV), particularly types 16 and 18, which are responsible for approximately 70% of all cervical cancer cases globally. HPV is a sexually transmitted infection (STI) with widespread prevalence, but not all infections lead to cancer. In most cases, the infection is transient and is cleared by the immune system. However, persistent infections with high-risk HPV types can lead to the development of precancerous lesions, which may progress to cervical cancer if left untreated. Despite this, cervical cancer is largely preventable through early detection, screening, and, crucially, vaccination. HPV vaccines have been shown to be highly effective in preventing infection with the most common cancer-causing HPV types. According to the World Health Organization (WHO), the introduction of the HPV vaccine has the potential to significantly reduce the global burden of cervical cancer,

particularly in regions where cervical cancer screening is limited. Indonesia has recently made strides toward addressing this public health issue by integrating HPV vaccination into its national immunization program. In 2022, Indonesia announced the inclusion of the HPV vaccine in the national mandatory immunization program, targeting school-aged girls as part of the country's effort to reduce the incidence of cervical cancer. The program aims to provide HPV vaccination to girls in the 5th grade (approximately 11–12 years old), with plans for gradual nationwide coverage. However, the successful implementation of this initiative requires comprehensive policy strategies that account for Indonesia's unique socio-cultural and healthcare landscape, including challenges related to vaccine accessibility, public awareness, and infrastructure limitations in rural areas.^{1–3}

In this policy review, we aim to examine the national HPV vaccination program from the perspective of recommendations provided by the Centers for Disease Control and Prevention (CDC). The CDC's guidelines on HPV vaccination emphasize its role as a primary prevention strategy for cervical cancer, recommending routine vaccination for children aged 11–12 years, with catch-up vaccinations for older adolescents and young adults. By analyzing Indonesia's HPV vaccination strategy within this framework, this review seeks to highlight key areas

where policy alignment with international best practices could enhance the program's effectiveness in curbing cervical cancer rates. Moreover, this review will examine potential barriers to the program's success and propose recommendations to optimize HPV vaccination coverage across regions in Indonesia.

METHODS

In this policy review, we conducted a comprehensive analysis of the National Mandated HPV Vaccination Program for school-aged children in Indonesia. Our methods included a systematic examination of HPV vaccination recommendations from the Centers for Disease Control and Prevention (CDC), a manual review of relevant Indonesian health policies and legislation, and an evaluation of the existing literature on the efficacy and outcomes of HPV vaccination programs worldwide. We also gathered data from government reports, public health records, and peer-reviewed journals to assess the current state and impact of HPV vaccination initiatives in Indonesia.

RESULTS

In this policy review, the analysis provides a detailed comparison between Indonesia's National Mandated HPV Vaccination Program and the CDC's HPV vaccination guidelines. **Table 1** outlines the key components of Indonesia's vaccination program, including free immunization for school-aged girls,

Table 1. Overview of the National Mandated HPV Vaccination Program in Indonesia Based on the National Action Plan 2023.^{4–7}

Key Points	Details
Free Immunization	The vaccine will be provided free of charge to all girls enrolled in grades 5 and 6 of secondary school, typically aged between 10 and 12 years old.
National Coverage	The program will be expanded to cover all cities and districts in Indonesia, ensuring that at least 90% of girls are vaccinated.
School-Based Program	The vaccination will be carried out through the School Children Immunization Month (BIAS) program, targeting students in elementary schools and their equivalents.
Government Support	The government has committed to making the HPV immunization a success through the issuance of a Joint Decree of Four Ministers, mandating all elementary schools to run a complete immunization program, including HPV vaccination.
Advocacy Efforts	Civil society organizations, NGOs, and women's health or cancer advocacy groups will play a crucial role in promoting the program, educating parents, and ensuring sustained momentum.
Logistical Support	The program will require careful planning and logistical support to rapidly expand the program and effectively vaccinate more than two million girls each year.
Monitoring and Evaluation	The program will be closely monitored and evaluated to ensure its success and long-term sustainability.



nationwide coverage targets, government support through a Joint Decree, and advocacy efforts involving civil society organizations. The program's implementation relies heavily on school-based initiatives, supported by extensive logistical planning to vaccinate over two million girls each year. **Table 2** provides a comparative analysis of key differences and similarities across target age groups, vaccination costs, and government involvement. The Indonesian program focuses specifically on school-aged girls, while the CDC recommends vaccination for both boys and girls through age 26. While the CDC's guidelines depend on healthcare providers for vaccine administration, Indonesia adopts a more structured, school-based approach. Additionally, adult vaccination and pregnancy considerations, which are central to the CDC's guidelines, are not included in Indonesia's

current plan. This comparative analysis underscores the unique strategies employed by each country to combat cervical cancer through HPV vaccination.

DISCUSSION

The comparison between Indonesia's National Mandated HPV Vaccination Program and the CDC's HPV vaccination guidelines highlights several important differences and similarities in their approach to cervical cancer prevention through immunization. Both programs emphasize the importance of vaccinating children early. However, Indonesia specifically targets girls aged 10–12 in grades 5 and 6, while the CDC recommends routine vaccination for both boys and girls starting at ages 11–12, with the option to begin as early as age 9.^{4,7} In terms of vaccine cost and coverage, Indonesia's program

provides the HPV vaccine free of charge, with a goal of achieving at least 90% coverage among eligible girls, demonstrating a strong commitment to widespread immunization. In contrast, the CDC's guidelines do not set specific coverage targets but focus on vaccinations administered by healthcare providers, where costs can vary by insurance.^{6,7}

When it comes to implementation, Indonesia runs a school-based program through the School Children Immunization Month (BIAS), which ensures structured, comprehensive outreach. In comparison, the CDC's strategy relies on healthcare providers to administer vaccines, which may lead to uneven access depending on healthcare availability.^{4,7} Government involvement and advocacy also differ between the two approaches. In

Table 2. Comparison of the Indonesian National Mandated HPV Vaccination Program and CDC HPV Vaccination Guidelines.^{4–7}

Aspect	Indonesian Program	CDC Guidelines
Target Age Group	Girls aged 10–12 years, enrolled in grades 5 and 6 of secondary school.	Children and adults aged 9–26 years are routinely recommended at ages 11 or 12, but can start at age 9. Vaccination is recommended for all up to age 26 who were not previously adequately vaccinated.
Vaccine Cost	Provided free of charge.	Varies by healthcare provider and insurance coverage.
Coverage Goal	At least 90% of girls nationwide.	No specific percentage goal is stated, the focus is on recommended age groups.
Implementation Method	School-based program through the School Children Immunization Month (BIAS) program.	Healthcare providers and clinics administer the vaccine.
Government Involvement	Joint Decree of Four Ministers mandating all elementary schools to run a complete immunization program, including HPV vaccination.	Recommendations issued by the Advisory Committee on Immunization Practices (ACIP) under CDC guidance.
Advocacy and Promotion	Supported by civil society organizations, NGOs, and women's health or cancer advocacy groups.	Emphasis on healthcare provider recommendations and patient education.
Logistical Requirements	Careful planning and logistical support to vaccinate over two million girls annually.	Managed by healthcare systems with guidance from CDC.
Monitoring and Evaluation	Program monitored and evaluated for success and sustainability.	Monitoring and evaluation through healthcare providers and public health systems.
Adult Vaccination	Not specified in the National Action Plan for Cervical Cancer Control 2023.	Recommended for adults aged 27–45 years based on individual clinical decision-making. HPV vaccination benefits are smaller in this age group due to likely prior exposure.
Pregnancy Consideration	Not specified.	Vaccination should be delayed until after pregnancy. No pregnancy test required before vaccination. No evidence of harm to the fetus or pregnancy.



Indonesia, the program is mandated by a Joint Decree of Four Ministers, reflecting a top-down policy supported by civil society organizations, NGOs, and women's health groups. On the other hand, the CDC's recommendations are developed by the Advisory Committee on Immunization Practices (ACIP), with healthcare providers playing a crucial role in education and advocacy for vaccination.^{5,7}

Both programs acknowledge the need for careful logistical planning and monitoring. Indonesia faces the substantial challenge of vaccinating over two million girls annually, whereas the CDC benefits from existing healthcare infrastructure to distribute and monitor vaccinations.^{6,7} Regarding adult vaccination and pregnancy considerations, the CDC offers specific guidelines for adults aged 27–45, recommending vaccination based on individual clinical decision-making, and advises against vaccinating during pregnancy. These considerations are not part of Indonesia's plan, which is solely focused on the younger target group.^{6,7}

Cervical cancer prevention is a multifaceted approach that involves three primary strategies, including HPV vaccination, regular screening, and early treatment of precancerous lesions. Each of these strategies plays an essential role in reducing the risk of cervical cancer and ensuring early detection and treatment when necessary.^{8,9}

HPV vaccination is the most effective way to prevent cervical cancer through vaccination against the Human Papillomavirus (HPV), which is the primary cause of cervical cancer. The HPV vaccine is recommended for both girls and boys aged 9–14 years, ideally before they become sexually active, as it provides the most protection when given before exposure to the virus. The vaccine

targets the high-risk strains of HPV that are most likely to lead to cervical cancer. The Centers for Disease Control and Prevention (CDC) recommends routine HPV vaccination for children aged 11 or 12, although vaccination can begin as early as age 9. For those who missed vaccination at a younger age, it is still beneficial for individuals up to age 26 to get vaccinated, though the vaccine is most effective when administered earlier. By vaccinating early, it is possible to protect individuals from the strains of HPV that cause the majority of cervical cancer cases.^{8,10,11}

Regular screening for cervical cancer is a critical component in preventing the disease by detecting precancerous changes in the cervix before they develop into cancer. Screening can help identify abnormal cells that, if left untreated, could eventually develop into cancer. The World Health Organization (WHO) recommends that screening be prioritized for women aged 35 and older, as they are at higher risk for cervical cancer. The screening process typically includes a Pap smear, in which cells from the cervix are collected and examined for abnormalities. The WHO recommends that women undergo screening every 5 years, with a total of 3 screenings over their lifetime. This regular screening schedule has been shown to significantly reduce the risk of cervical cancer by allowing for early detection and treatment of any precancerous lesions. In some cases, the Pap smear may be combined with testing for HPV, which further improves the ability to identify women at higher risk of developing cervical cancer.^{12–14}

Early detection of cervical cancer is crucial for effective treatment. When abnormal cells or precancerous lesions are identified during screening, prompt treatment can prevent the progression to cancer. Various treatment options are available to manage these lesions,

and the choice of treatment depends on the severity and location of the abnormalities. The most commonly recommended treatments for precancerous lesions include cryotherapy, the loop electrosurgical excision procedure (LEEP), and cold knife conization. Cryotherapy involves freezing the abnormal cells, while LEEP uses a small electrical loop to remove the tissue. Cold knife conization is a surgical procedure that removes a cone-shaped piece of tissue from the cervix. These treatments are highly effective in eliminating abnormal cells, and when performed early, they significantly reduce the risk of developing cervical cancer later on. WHO emphasizes that with early detection and prompt, high-quality treatment, cervical cancer can be cured at any stage, and women of all ages benefit from such interventions.^{15–16}

Together, these prevention strategies form a comprehensive approach to reducing the incidence of cervical cancer. The HPV vaccination protects individuals from the virus, screening allows for early detection of potential problems, and early treatment ensures that any precancerous conditions are addressed before they become cancerous. By following these strategies, cervical cancer can be effectively prevented, detected early, and treated, saving countless lives worldwide.

CONCLUSION

In conclusion, both Indonesia's National Mandated HPV Vaccination Program and the CDC's HPV vaccination guidelines aim to prevent cervical cancer through early immunization, but they differ in approach and implementation. Indonesia's top-down mandate and extensive advocacy contrast with the CDC's provider-driven and insurance-dependent model. Both programs face logistical challenges, emphasizing the need for effective planning and monitoring.

REFERENCES

1. World Health Organization. Estimated cancer incidence, mortality and prevalence worldwide in 2012 [Internet]. Geneva: World Health Organization; 2012 [cited 2024 Jun 1]. Available from: <http://globocan.iarc.fr/old/FactSheets/cancers/cervix-new.asp>.
2. Pusat Data dan Informasi Kementerian Kesehatan RI. Beban kanker di Indonesia [Internet]. Jakarta: Kementerian Kesehatan RI; 2019 [cited 2024 Jun 1]. Available from: <https://pusdatin.kemkes.go.id/download.php?file=download/pusdatin/infodatin/Infodatin-Kanker2019.pdf>.
3. University of Melbourne. Indonesia takes an impressive step toward cervical cancer control [Internet]. Pursuit; 2023 [cited 2024 Jun 1]. Available from: <https://pursuit.unimelb.edu.au/articles/indonesia-takes-an-impressive-step-toward-cervical-cancer-control>.



4. International Vaccine Access Center (IVAC). HPV vaccine progress and next steps for advocacy in Indonesia: findings from key informants [Internet]. Baltimore: Johns Hopkins Bloomberg School of Public Health; 2023 [cited 2024 Jun 1]. Available from: <https://publichealth.jhu.edu/sites/default/files/2024-02/hpv-vaccine-advocacy-in-indonesiaivac2023ax.pdf>.
5. International Vaccine Access Center (IVAC). Next steps for HPV vaccine advocacy in Indonesia [Internet]. Baltimore: Johns Hopkins Bloomberg School of Public Health; 2023 [cited 2024 Jun 1]. Available from: <https://publichealth.jhu.edu/sites/default/files/2024-02/3advocacy-needs-for-hpv-vaccines-in-indonesiaax.pdf>.
6. Minister of Health Republic of Indonesia. National cervical cancer elimination plan for Indonesia 2023-2030 [Internet]. Jakarta: Minister of Health Republic Indonesia 2023 [cited 2024 Jun 1]. Available from: https://www.iccp-portal.org/system/files/plans/National%20Cervical%20Cancer%20Elimination%20Plan%20for%20Indonesia%202023-2030_compressed.pdf.
7. Meites E, Szilagyi PG, Chesson HW, Unger ER, Romero JR, Markowitz LE. Human papillomavirus vaccination for adults: updated recommendations of the advisory committee on immunization practices. *MMWR Morbidity and Mortality Weekly Report* 2019;68(32):698–702. doi: 10.15585/mmwr.mm6832a3.
8. Fowler JR, Maani EV, Dunton CJ, Gasalberti DP, Jack BW. Cervical cancer. StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2026 Jan-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK431093/>.
9. Arrossi S, Temin S, Garland S, Eckert LO, Bhatla N, Castellsague X, et al. Primary prevention of cervical cancer: American society of clinical oncology resource-stratified guideline. *J Glob Oncol*. 2017;3(5):611–34. doi: 10.1200/JGO.2016.008151
10. Shamsi U, Zahid F, Abdul Jabbar AB, Musharraf MD, Gauhar F, Akbar I, et al. Human papillomavirus vaccine awareness and acceptability for primary prevention of cervical cancer in Pakistan: a cross-sectional study. *Asian Pac J Cancer Prev*. 2024;25(3):813–20. doi: 10.31557/APJCP.2024.25.3.813
11. Kaur P, Mehrotra R, Rengaswamy S, Kaur T, Hariprasad R, Mehendale SM, et al. Human papillomavirus vaccine for cancer cervix prevention: rationale & recommendations for implementation in India. *Indian J Med Res*. 2017;146(2):153–7. doi: 10.4103/ijmr.IJMR_1906_16.
12. Kim JJ, Burger EA, Regan C, Sy S. Screening for cervical cancer in primary care: a decision analysis for the US Preventive Services Task Force. *JAMA*. 2018;320(7):706–14.
13. Agorastos T, Chatzistamatiou K, Katsamagkas T, Koliopoulos G, Daponte A, Constantinidis T, et al. Primary screening for cervical cancer based on high-risk human papillomavirus (HPV) detection and HPV 16 and HPV 18 genotyping, in comparison to cytology. *PLoS One*. 2015;10(3):e0119755. doi: 10.1371/journal.pone.0119755.
14. Ramirez AT, Valls J, Baena A, Rojas FD, Ramirez K, Alvarez R, et al. Performance of cervical cytology and HPV testing for primary cervical cancer screening in Latin America: an analysis within the ESTAMPA study. *Lancet Reg Health Am*. 2023;26:100593. doi: 10.1016/j.lana.2023.100593.
15. Saidu R, Morhason-Bello I. Same-day test and treat for early detection and treatment of cervical cancer in LMICs. *Lancet Glob Health*. 2022;10(9):e1226–7. doi: 10.1016/S2214-109X(22)00316-3.
16. Update management of cervical precancer lesion. *J ObstetGynaecol Res*. 2023;49(Suppl 1):191–202. doi: 10.1111/jog.15604.