ECO Good Practice Guide on HPV Vaccination: a Factsheet

Make it policy. Make it happen. Make it last

VACCINATION DELIVERY

Principles

Principle 1. Choose delivery platforms that maximise reach and reliability

Are HPV vaccines delivered through platforms that easily and reliably reach the target population?

Countries should select vaccination platforms best suited for their context, including school-based, healthcare-based, and pharmacist-led delivery, to maximise reach and sustained coverage of the target population.

Principle 2. Build workforce and system readiness for consistent delivery

Are there adequate systems and sufficient people to deliver HPV vaccination programmes consistently at scale?

Countries should ensure appropriate delivery systems are in place, supported by sufficiently trained personnel and logistical readiness to support reliable HPV vaccination across all selected delivery platforms.

Principle 3. Design vaccination policies that support routine delivery

Are HPV vaccination policies easy to implement in routine practice?

Countries should adopt HPV vaccination policies, including age eligibility, dosing and administration schedules, and consent and authorisation requirements that are straightforward to implement, are aligned with routine delivery opportunities, and minimise the risk of missed or delayed vaccination.

Vaccine Doses and Scheduling

In the European Union, HPV vaccines are authorised by the European Medicines Agency (EMA) with licensed schedules of two or three doses, depending on age and immune status.

The World Health Organization (WHO) has a critical role in helping to guide countries around the globe on how best to meet global health commitments, such as cervical cancer elimination. It is in this context that the WHO produces guidance documents to support countries at any level of health system development to meet public health obligations, including on vaccination. These are often especially useful in the most resource-constrained environments, such as low and middle-income Countries (LMICs).

WHO public health guidance on HPV vaccine dosing

Two-dose schedule

Current WHO guidance (2022) recommends a two-dose schedule to be used in the primary target group from 9 years of age, and for all older age groups for which HPV vaccines are licensed. The minimum recommended interval between the first and second dose is 6 months [1].

Alternative single dose schedule

However, the same guidance document also contains permissive recommendations about off-label dosing options. In particular, it suggests that a single-dose schedule could be considered in girls and boys aged 9-20 years. This recommendation reflects analyses of available evidence suggesting that a single dose might have comparable efficacy and duration of protection to a two-dose schedule.

However, WHO also notes that additional evidence should be generated on the long-term immunogenicity, efficacy, effectiveness, and duration of protection of single-dose HPV schedules in girls aged 9-14 years, boys, older women and men, and children aged under 9 years of age. As a priority, evidence is needed on the immune response and efficacy of reduced-dose schedules in immunocompromised individuals and people living with HIV. [1].

Scientific discussion on single-dose scheduling continues, particularly in high-income country settings where multidose programmes are well-established [14]. Practice examples from countries experimenting with single-dose programmes are still being collated, with Australia among those currently in the process of reporting outcomes [15].

As with use of other types of medications, the European Cancer Organisation recommends HPV vaccination for girls and boys in accordance with the most current licensed schedules, while also supporting the WHO's call for the generation of further evidence on the long-term immunogenicity, efficacy, effectiveness, and duration of protection of single-dose HPV schedules.

Justification & Scientific Evidence

School-based HPV programmes are among the most effective and equitable way to achieve high vaccination coverage. High coverage can also be achieved through well-organised healthcare-based or other delivery platforms.

Organised delivery platforms that reliably reach adolescents are a key determinant of high HPV vaccination coverage, regardless of the specific setting used [2].

Across multiple countries in Europe, school-based HPV vaccination programmes are consistently associated with high overall coverage and more equitable reach as this is the setting where children and adolescents spend a significant portion of their time [3, 4]. European guidance further indicates that, where feasible, school-based immunisation is often among the lowest-cost delivery options for HPV vaccination, as it reaches whole cohorts efficiently and keeps organisational and delivery costs relatively low, although local factors such as school health infrastructure, consent arrangements, and funding mechanisms influence feasibility [5, 6].

European experience also demonstrates that high coverage can be achieved through well-organised healthcare-based or other delivery platforms, reinforcing that delivery success is not dependent on a single model [2, 4]. In some settings, primary care services and pharmacist-led delivery may help expand access by providing additional vaccination opportunities, supporting vaccine confidence through trusted patient-doctor relationships, and increasing the number of accessible vaccination sites. Evidence from high-income countries with established school-based HPV vaccination programmes indicates that inequalities in uptake may persist, with girls from lower socioeconomic status (SES) and minority ethnic groups tending to be less likely to be vaccinated [7]. These findings could inform targeted approaches to catch-up vaccination. HPV vaccination delivery should also be considered within a life-course immunisation approach, with opportunities to vaccinate through adolescent programmes, catch-up activities, and primary care services. Further detail on catch-up and extended-age vaccination is provided in section 6.

Adequate delivery systems, supported by sufficient trained personal and logistics, are a prerequisite for consistent and scalable HPV vaccination programmes

HPV vaccination programmes that achieve sustained coverage are characterised by planned and recurrent delivery arrangements for adolescents, with clearly designated vaccinators who are trained and authorised to deliver HPV vaccination within those settings, reflecting the additional coordination required compared with infant immunisation [8].

HPV specific implementation guidance indicates that HPV vaccine introduction requires careful planning of delivery strategies and logistics because the target group is outside of routine immunisation, and that building health worker capacity and skills is an essential part of implementation support [3, 8].

European countries show substantial variation in HPV vaccination coverage, alongside marked differences in delivery organisation, workforce arrangements, and system readiness [1].

Policy design choices relating to age eligibility, dosing schedules, and consent requirements directly shape how easily HPV vaccination can be delivered in routine practice, with more complex or restrictive policies increasing the risk of missed or delayed vaccination.

WHO implementation guidance emphasises that delivery feasibility should be considered at the policy design stage, including alignment of eligibility criteria and vaccination schedules with existing delivery opportunities, such as school-based or other adolescent health platforms, to support consistent implementation and reduce missed vaccinations [8]. Additionally, complex eligibility criteria such as multiple age cut-offs, sex-specific rules, or narrowly defined target cohorts, as well as restrictive scheduling or delivery arrangements that are poorly aligned with service organisation can increase operational burden and hinder programme performance [8,9].

ECDC guidance on HPV vaccine introduction in EU countries, and information from the Vaccine Scheduler describes how age eligibility, consent models, and scheduling choices affect the feasibility of delivery across different settings, including schools and healthcare services [2,10].

Case Studies

Sweden

Sweden's school-based HPV vaccination programme offers a compelling example of effective public health intervention. Introduced in 2012 for girls and expanded in 2020 to include boys, the programme is delivered primarily through schools, ensuring high coverage and equitable access. Sweden is internationally recognised for the political decision taken by Parliament in 2021 that cervical cancer should be eliminated as soon as possible, with the target year set at 2027. The strategy involves i) rapidly achieving a population immunity (herd immunity) against HPV using an ambitious HPV vaccination strategy including routine universal (gender-neutral) vaccination free of charge for all individuals up to age 26 and systematic HPV vaccination concomitant with cervical screening (using HPV) for women up to age 30 and ii) achieving high coverage of HPV screening using population-based mail-to-home HPV self-sampling for women in the age span 23-77 years of age.

There is growing evidence of herd effects from school-based HPV vaccination, with reductions in HPV prevalence appearing greater than would be expected from direct protection alone, as well as reductions in cervical lesions among unvaccinated individuals from the same birth cohort. [10, 11]. The incidence of invasive cervical cancer in Sweden is decreasing rapidly. [18].

Portugal

Portugal has been achieving high HPV vaccination rates among boys and girls. However, in Portugal, the strategy was not through school-based HPV vaccination programmes, but through integration into primary healthcare. Children and young people are regularly monitored through medical and nursing consultations under the National Child and Youth Health Program, which aligns these consultations with the national vaccination programme to enhance accessibility. Additionally, primary healthcare nurses use the VACINAS platform, a centralised digital registry to monitor vaccination records. In cases of delayed vaccinations, parents or legal guardians are notified, and a schedule for HPV vaccine administration is proposed, ensuring continuity and high vaccination coverage. Nevertheless, it is important to acknowledge that no approach will be universally applicable, as vaccination strategies must be adapted to each country's healthcare system, infrastructure, cultural context, and population needs, with Portugal serving only as an example that high coverage can be achieved without a school-based programme [12].

Kosovo

Kosovo provides a recent example of how early investment in workforce capacity and system readiness can support the successful introduction of HPV vaccination at national scale. Following a recommendation from the NITAG, HPV vaccination was introduced in February 2024 for 12-year-old girls using a single-dose schedule, with expansion to boys of the same age in 2025 [16, 17]. Preparation for vaccine introduction included the development and delivery of a standardised training module for healthcare workers and immunisation staff, adapted from WHO materials and covering vaccine safety, effectiveness and practical aspects of delivery in both school-based and healthcare settings. Delivery readiness was further strengthened through

coordinated planning and monitoring involving the Ministry of Health, Institute of Public Health and the WHO. This enabled routine field monitoring, tracking of vaccine coverage and efficiency, systematic surveillance of adverse events following immunization (AEFI), and follow-up on priority implementation actions. In parallel, the digital vaccination module within the national Health Information System was updated, allowing real-time data collection, reporting and performance monitoring.

HPV vaccination was delivered primarily through schools, complemented by primary healthcare facilities and targeted outreach efforts, including mobile teams for children not regularly attending school. According to the 2024 administrative data from the National Institute of Public Health (NIPH), HPV vaccination coverage in girls reached 85% in the first year of programme implementation [17].

Further Reading & Bibliography

- WHO – Guide to introducing HPV vaccine into national immunization programmes
- WHO – Scaling up HPV vaccine introduction
- ECDC – Guidance on HPV Vaccination in EU Countries: Focus on boys, living with HIV and 9-valent HPV vaccine introduction

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