JSI Research & Training Institute, Inc.

Resource Guide for Strengthening HPV Vaccination Service Delivery

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Cover photo: Girl receiving HPV vaccination, Ethiopia. © UNICEF Ethiopia /2018/Nahom Tesfaye

ACRONYMS

EPI	Expanded Program on Immunization
HF	health facility
HPV	human papillomavirus
KII	key informant interview
LMIC	low- and middle-income countries
NSO	national statistical office
RED	Reaching Every District
RI	routine immunization
SAGE	Strategic Advisory Group of Experts
UNICEF	United Nations Children's Fund
WHO	World Health Organization

INTRODUCTION

Cervical cancer is the fourth-most frequently diagnosed cancer and the fourth leading cause of cancer deaths in women globally, with an estimated 604,000 new cases and 342,000 deaths occurring in 2020 (Sung et al. 2021). Almost all cervical cancer cases are caused by the human papillomavirus (HPV). In 2020, approximately 90 percent of cervical cancer deaths worldwide occurred in low- and middle-income countries (LMICs). Sub-Saharan Africa has the highest regional incidence of HPV infection and mortality (Sung et al. 2021).

HPV often causes asymptomatic infections that may resolve on their own. However, if untreated, some infections progress to cancers of the cervix, vagina, vulva, oropharynx, penis, anus, head, or neck. HPV vaccines, available since 2006, can prevent 90 percent of cervical cancer cases (Simelela 2021). In 2020, the World Health Assembly adopted a global strategy for eliminating cervical cancer that includes the 2030 goal of fully vaccinating 90 percent of girls with the HPV vaccine by age 15 (World Health Organization 2020a).

The World Health Organization (WHO) recommends including HPV vaccines in national immunization programs. The vaccines are intended to be administered before the onset of sexual activity, that is, before first potential exposure to HPV infection (World Health Organization 2017a). In most LMICs, the primary target group for the vaccine is girls ages 9–14.

Despite its benefits, the HPV vaccine has been widely underutilized. In addition, HPV vaccination was adversely affected by the COVID-19 pandemic, as demonstrated in 2021 data that revealed only 15 percent global coverage for HPV vaccine dose 1 ("WHO/UNICEF Estimates of National Immunization Coverage" n.d.), significantly lower than the 80 percent target required for herd immunity.

JSI conducted an evidence-based analysis to delineate factors that influence HPV vaccination rates and enable high HPV vaccine coverage in low-, middle-, and high-income countries. The analysis included a desk review of the published and gray literature on HPV vaccine delivery and key informant interviews (KIIs) with a number of national and global immunization stakeholders who work in HPV vaccine service delivery and/or are engaged in documenting HPV vaccination learnings.

JSI drew on these desk review and KII findings in developing this resource document, which provides operational guidance on the key elements of HPV delivery systems critical to increasing HPV vaccine coverage. The guide features our findings related to service delivery challenges, strategies, and recommendations.

Supportive supervision on HPV vaccination, Kenya

DEFINITIONS

Caregiver: An individual directly responsible for the care of a child or adolescent, including but not limited to mothers, fathers, and adults in the extended family, who is eligible to provide consent for the child to receive health services.

Health facility: A publically funded or privately owned organization that provides a range of healthcare services, including immunization.

Healthcare provider: An individual who provides health services in a professional capacity, including but not limited to physicians, nurses, and community health workers.

School staff: Employees of publicly or privately funded primary and secondary schools, including but not limited to school leaders, administrators, teachers, and support staff.

PURPOSE

This guide is a broad synthesis of the HPV vaccine service delivery-related challenges, evidence-based solutions, and promising practices that national and sub-national program planners and implementers in LMICs commonly encounter. Because the opportunities for and obstacles to HPV vaccine service delivery vary significantly by country, this guide does not provide a checklist of recommended actions to be followed in a specific sequence. Instead, it elucidates what we know from the literature, best

practices, and global stakeholders, and presents issues to consider and resources to explore when developing and refining a national, regional, or local approach to HPV vaccination. Given that there is no one-size-fits-all approach to HPV vaccine service delivery, program planners and implementers will need to adapt this information to their context, including aligning their approaches with national guidance and plans.

The objectives of this guide are to:

1. Support countries to make informed decisions about HPV vaccination service delivery.
2. Provide practical guidance to national and subnational stakeholders on HPV vaccination planning, implementation, and monitoring and evaluation to strengthen service delivery.

HOW TO USE THIS GUIDE

This guide is designed for use by individuals who plan, implement, and manage HPV vaccination programs and/or strategies at a national or subnational level. In addition to the information provided here, many other resources provide solid guidance on overarching issues related to HPV vaccination. A brief list of these appears at the end of this guide.

The guide is divided into seven main sections:

- Planning and Coordination
- Service Delivery Strategies
- Integrating HPV Vaccination with Other Health Services
- Training and Supportive Supervision
- Microplanning for HPV Vaccination
- Routine Monitoring and Evaluation
- Communications and Social Mobilization

The sections that follow include information on common HPV vaccination challenges and potential solutions, resource documents, and key considerations.

The following icons appear throughout the guide:

Essential Documents provides a list of the leading resources on a given topic.

Key Considerations describes critical issues to explore throughout the planning and implementation processes.

PLANNING AND COORDINATION

HPV vaccination planning and coordination should occur in the context of comprehensive annual/multi-year country planning for health and immunization service delivery. Doing so enables HPV vaccination to leverage the strengths of the existing health system and can help ensure that the range of resources required (e.g., vaccines, cold chain equipment, human resources, capacity building) is continuously available.

Planning and coordination is also the time to explore incorporating HPV vaccination in the country's Expanded Program on Immunization (EPI) so it can draw on that system's broader programmatic, human, and financial resources. When processes such as HPV and routine immunization (RI) microplanning and vaccine distribution are combined, HPV vaccination becomes a standard component of the EPI, rather than an isolated component that must be funded separately.

Countries should plan HPV vaccination programs that are compatible with their health system's infrastructure (including cold chain capacity), focusing on delivery strategies that are affordable, cost-effective, sustainable, and capable of achieving the highest possible coverage.

During HPV vaccination planning, determine the target population, delivery strategies, vaccination schedule, and relevant logistics. Plans should delineate the government agencies, organizations, and implementing partners that will be involved and include a timeline, budget, and a description of the activities to be conducted and who is responsible for each.

Consistent with standards for introducing vaccines, national stakeholders must thoroughly assess cold chain capacity to plan vaccine storage and transport before making the HPV vaccine available.

During the planning stage, gather and begin to communicate data about the incidence of HPV infection, the national cervical cancer burden, and HPV vaccine efficacy, cost-effectiveness, and safety. Share this information first with decision-makers and, prior to vaccine rollout, the public.

Successful HPV vaccine service delivery requires close coordination of the health, education, and financial sectors and the engagement of a range of stakeholders, including civil society organizations and other non-traditional partners (e.g., specialists in cancer/noncommunicable diseases, adolescent health, women's rights, and gender equity; parent-teacher associations and professional associations of oncologists, gynecologists, and nurses). Carefully consider which partners need to be highly engaged in decision-making for vaccine implementation and those whose efforts will be more effective in advocacy and community engagement efforts.

Training for healthcare professionals on HPV vaccination should be planned and managed at the national level. Involve education and health sector representatives to ensure that the training effectively conveys essential information and skills so that local education staff and healthcare workers understand the purpose of HPV vaccination and can respond to the public's questions and deliver (or support) vaccine services.

As HPV vaccine supplies increase, more countries will consider whether to vaccinate adolescent boys and girls (Kreimer et al 2023). While including adolescent boys in the target population for HPV vaccination can reduce transmission of HPV and the incidence of HPV-related cancers, it is not encouraged for countries that lack the human resources and/or vaccine supply to reach the primary target population of girls 9–14. Countries should conduct a thorough analysis and engage national advisory bodies, such as the National Immunization Technical Advisory Group, before deciding whether vaccinating adolescent boys will advance or impede implementation of a robust, sustainable program.

HPV VACCINE SINGLE-DOSE SCHEDULE

Girl receiving HPV vaccination, Kenya

In April 2022, the WHO Strategic Advisory Group of Experts on Immunization (SAGE) assessed evidence on the efficacy of a single-dose HPV vaccine schedule compared to two- and three-dose schedules. Following the meeting, WHO updated its position paper on HPV vaccines to say that an off-label single-dose schedule provides efficacy and duration of protection comparable to a two-dose schedule.

They recommend:

- A one- or two-dose schedule for girls ages 9-14
- A one- or two-dose schedule for girls and women ages 15-20
- Two doses with a six-month interval for women over 21
- A minimum of two doses and where possible three for immunocompromised people and those living with HIV (World Health Organization 2022).

The single-dose HPV vaccination schedule contains distinct benefits, including significant reductions in the cost of procuring, transporting, storing, and delivering the vaccine, and the potential to integrate it more readily with other health services. Decisions related to vaccination regimes should be individualized to the setting, infrastructure, and health economics of the country, with changes closely monitored.

Countries that transition from two to one dose may decide to either double the number of girls of the same age to be vaccinated or use the same number of doses to vaccinate a multiage cohort of girls, but with lower coverage at each age. Countries are being encouraged to leverage the single-dose schedule to improve access to HPV vaccination, namely by prioritizing vaccination of multiage cohorts of girls to "avert the millions of projected cervical cancer cases, which account for most global HPV-related cancers expected to occur over the coming decades" (Kreimer et al. 2022).

Countries planning to transition from a two- to a single-dose regimen should revise relevant policy guidelines and operational plans, including the national HPV strategy; training curricula; information, education, and communications materials; and monitoring and evaluation tools. Orient health workers to the new dosing schedule and widely communicate the change to stakeholders, caregivers, educators (if schools are involved in vaccine delivery), and communities, while reassuring all audiences of the efficacy of a single dose. Prioritize strategies to reach underserved communities and populations at the highest risk for HPV infection and cervical cancer.

Essential Documents on Planning and Coordination

- WHO Guide to Introducing HPV Vaccine into National Immunization Programmes, 2016
- Human Papillomavirus Vaccines: WHO Position Paper (2022 Update)

Note that a variety of HPV vaccination planning tools are available in the WHO HPV Vaccine Introduction Clearing House, including resources on vaccine introduction, school vaccination readiness, planning communications, and vaccine consent.

Key Considerations for Planning and Coordination

- Identify and engage HPV vaccination stakeholders at the national and subnational levels in planning and throughout implementation and monitoring.
- Identify and engage nontraditional immunization partners (e.g., cancer, noncommunicable diseases, and adolescent health specialists; professional associations of oncologists and gynecologists) in specific aspects of HPV vaccination.

SERVICE DELIVERY STRATEGIES

HPV vaccine delivery strategies should be compatible with the country's health system infrastructure. The goal is to achieve the highest possible coverage while considering affordability, cost-effectiveness, and sustainability (World Health Organization 2016). The frequency with which HPV vaccination sessions occur can have a significant effect on access and coverage. Most LMICs use a combination of delivery strategies for HPV vaccination, namely health facility vaccination, school-based vaccination, and vaccine campaigns, as described below.

Health Facility Vaccination

Health facilities (HFs) provide routine primary vaccination through fixed immunization services (i.e., within the HF) and outreach services (to populations within five or more kilometers of the HF). Strategies that HFs employ may include integrating HPV vaccination during fixed RI sessions, providing the vaccine on designated days, and delivering the vaccine in schools or through outreach sessions at community sites.

Because RI has historically focused on infants and pregnant women, additional outreach may be needed for HPV vaccination, in particular activities designed to reach girls ages 9–14. HFs that also develop and implement strategies to reach out-of-school girls with the vaccine are typically better able to serve this population than programs that are exclusively school-based. HFs can coordinate with community health workers and networks to identify and reach out-of-school girls.

School-Based Vaccination

Schools provide a platform for vaccinating large numbers of adolescent girls against HPV quickly, thereby making school-based service delivery relatively effective in achieving high uptake. Offering the vaccine in schools provides access for girls who live far from or are unable to reach an HF, and means that girls do not have to miss an entire day of school to travel to an HF for vaccination. School-based vaccination also reduces socioeconomic obstacles, such as travel costs and time away from household duties or work, given that caregivers (typically mothers) do not need to accompany their daughters, as they might for HF-based vaccination.

School-based vaccination involves challenges including increased overall operational costs (especially in locations where school health services are limited or nonexistent); vaccine uptake and completion obstacles (e.g., students absent on vaccination days, transferring from one school to another, boarding at schools far from their home); and difficulty reaching out-of-school girls.

School-based delivery requires health and education systems to take joint ownership of the HPV vaccination program and collaborate with public, private, religious, and boarding schools. Private schools with more stringent policies that could limit in-school vaccination should be involved early in planning to increase their participation. If the vaccine will be delivered to a multiage cohort of girls, involve secondary and primary schools in planning and implementation. Inform caregivers about upcoming vaccination sessions in advance.

Consent for HPV vaccination

Opt-in consent methods (when caregivers provide written consent before vaccination) can result in comparatively low coverage rates because they rely on girls delivering the consent form to their caregiver, obtaining a signature, and returning the signed form to school. It is possible to increase the likelihood that caregivers will consent to their daughters' vaccination. Providing the vaccine as one of several being administered has resulted in greater caregiver acceptance (Middleman et al. 2016). Having school staff inform caregivers about the vaccine and obtain caregiver consent for vaccination can also be an effective strategy. Further, it has been demonstrated that including daughters in conversations about the vaccine can increase caregiver consent (La Vincente et al. 2015; Jones and Kawesa-Newell 2021; Feiring et al. 2015). Girls whose mothers discuss sex, contraception, and/or sexually transmitted infections with them are significantly more likely to initiate and finish the HPV vaccination series (Jones and Kawesa-Newell 2021).

Vaccination Campaigns

HPV vaccination campaigns are often conducted on a large or countrywide scale. They may be used only at vaccine introduction, as part of an ongoing strategy, to reach girls who were not vaccinated through HFs or schools, or to deliver catch-up doses. For a two-dose vaccine schedule, the campaign would need to be conducted twice a year or two years in a row and then every five years after that.

During a campaign, if the vaccine is delivered via healthcare providers, the providers travel to communities to vaccinate girls, which requires leaving their other work responsibilities for the day and most likely disrupting regularly scheduled HF services (World Health Organization 2016). HPV vaccination campaigns can be effective in countries with small and hard-to-reach populations but can also significantly strain health systems and be hard to sustain.

Essential Documents on Service Delivery Strategies

Health facility vaccination:

- WHO Guide to Introducing HPV Vaccine into National Immunization Programmes, 2016

School-based vaccination:

- School Vaccination Readiness Assessment Tool: A Tool for Countries to Assess the Capacity of Their Education and Health Systems to Support HPV Vaccination in Schools, 2013
- Considerations Regarding Consent in Vaccinating Children and Adolescents Between 6 and 17 Years Old, 2014

Vaccination campaigns:

- Guide to Introducing HPV Vaccine into National Immunization Programmes, 2016

Key Considerations for Service Delivery Strategies

Health facility vaccination:

- HFs need to partner with local healthcare providers and community leaders to identify and bring the vaccine to hard-to-reach girls and other underserved people.
- Eligibility is most accurately determined by a girl's age (i.e., year of birth).

School-based vaccination:

- Strong partnerships between the national immunization program and schools are required for school-based delivery. These partnerships need to be fostered carefully, including through regularly scheduled meetings to exchange information.
- If the vaccine is delivered through schools primarily, the immunization program and community members must develop and implement strategies to identify and reach out-of-school girls.
- WHO recommends vaccinating girls by age rather than grade because girls of the same age may be spread across multiple grades.
- Opt-out vaccine consent (as opposed to opt-in) is recommended for school-based delivery.

Vaccination campaigns:

- HPV vaccination campaigns can be used to increase coverage quickly, to vaccinate hard-to-reach populations, and for catch-up vaccination. Campaign follow-up activities must be linked to the RI system to identify and reach girls missed during the campaign.

INTEGRATING HPV VACCINATION WITH OTHER HEALTH SERVICES

HPV outreach vaccination, Kenya

As countries begin to incorporate HPV vaccination in their national immunization program to achieve efficiencies, they often seek to identify other health interventions for adolescent girls that can be implemented in conjunction with HPV vaccination (Morgan et al. 2022). Integrating HPV vaccination with RI can be challenging because RI primarily focuses on a different population (children 0–11 months) from HPV vaccination.

HPV vaccination can be paired with services such as vision screening, the provision of health information and health commodities like deworming drugs, and the administration of other adolescent vaccines like the typhoid vaccine (Dochez et al. 2017). Tanzania's HPV-Plus project incorporates adolescent health education, deworming, nutrition, and vision screening services with HPV vaccination in schools and HFs and during outreach immunization sessions (Morgan et al. 2022). Health education (including information on cervical cancer and menstrual hygiene) is offered to girls ages 10–14 and vision and nutrition screening, deworming, and HPV vaccination are provided to girls age 14. Healthcare workers deliver these services with support from school health coordinators and teachers.

Because there is not yet an evidence base on the effects of integration on HPV vaccination, it is important to monitor and evaluate integration initiatives.

Essential Document on Integration

- Options for Linking Health Interventions for Adolescents with HPV Vaccination, 2014

Key Considerations for Integration

- Program planners and managers should consider integrating HPV vaccination into other health services, especially where established adolescent health, school health, sexual and reproductive health, or cancer control programs exist.
- Link HPV vaccination to effective health programs that are compatible with HPV prevention and services for adolescent girls instead of to unrelated interventions.
- Integrate vaccination with other health services that are age-appropriate, effective, and unlikely to hinder HPV vaccine service delivery.
- Monitor to ensure that integrating HPV vaccination with other health services does not compromise the quality of any of the services delivered.

TRAINING AND SUPPORTIVE SUPERVISION

HPV vaccination has requirements that diverge from other immunization efforts (e.g., it targets early adolescents, an age group that RI programs are unaccustomed to reaching; it typically requires using new delivery platforms and a combination of strategies). These factors underscore the need for training specific to HPV vaccination. It is crucial to provide healthcare and education professionals with initial and refresher training and supportive supervision on essential HPV vaccination information, resources, and skills.

Training can occur in-person, virtually, or through a mixture of in-person and virtual training sessions. The modality selected should align with training goals and content, available resources, and participant and trainer needs.

In-person cascade training has been widely used for various health interventions. In HPV vaccination cascade training, a group of national-level master trainers is trained in HPV vaccine service delivery, then charged with training subnational healthcare workers, who are tasked with training staff in HFs and schools. When done well, cascade training can be efficient and cost-effective.

The primary disadvantage of cascade training is the absence of quality control, especially for trainings conducted at the subnational level. Funding for training is often insufficient or delayed, and key messages are more likely to be diluted or misinterpreted by the time the training reaches staff in HFs and schools, negatively influencing HPV vaccine implementation. National and regional/provincial or equivalent level staff must monitor and follow up with trainers and participants to ensure that the transfer of information and skills is consistent and follows standards. There should be mechanisms for periodic refresher and update training as interventions and approaches evolve (e.g., when multi-age cohort vaccination is conducted in addition to routine HPV vaccine delivery).

It is also critical to reinforce and monitor skills learned during initial training through supportive supervision, including on-the-job training and mentorship. Supportive supervision strengthens health worker capacity and improves performance (Avortri, Nabukalu, and Nabyonga-Orem 2019). Supervision visits can be used to provide feedback, update staff on HPV and other vaccines, enhance motivation, and identify training needs. Adapt supportive supervision checklists to include HPV vaccination. Implement peer-learning strategies such as using district-level review meetings to build health worker capacity (Shimp et al. 2017) and using WhatsApp to advance health workers' ability to mentor their peers (Hossain 2021).

Educators have an important role in school-based HPV vaccination and should be trained before the vaccine is introduced in schools and included in refresher trainings and capacity-building opportunities. School staff who have been trained on HPV vaccination can educate caregivers and girls about the benefits of the vaccine, respond to their questions and concerns, and coordinate vaccinators and service delivery on school premises.

Comprehensive, timely training is required for healthcare workers to understand the target population and the strategies and procedures to vaccinate them. Training should be skills-based, interactive, and led by experienced trainers. One country's rushed training was criticized because after it, healthcare workers identified 14-year-old girls as eligible for vaccination rather than the target population of nine-year-olds. Additionally, out-of-school girls were not targeted because some communities thought the vaccine would only be administered in schools (Hausi et al. 2021).

Essential Document on Training and Supportive Supervision

- WHO Guide to Introducing HPV Vaccine into National Immunization Programmes, 2016

Key Considerations for Training and Supportive Supervision

- National-level stakeholders should adopt an HPV vaccination training curriculum for healthcare workers and educators and secure the resources to implement training and supportive supervision.
- Trainers should ensure that the training they provide is practical and interactive.
- Develop a database of which healthcare workers have and have not been trained to monitor training needs.
- Following initial training, senior healthcare professionals should provide vaccinators and school staff with continual on-the-job training and/or mentorship through supportive supervision.
- When following a multiple-dose schedule, consider conducting refresher training for healthcare providers at district and HF levels before administering the second dose.
- Due to high turnover among health and education staff and periodic changes in HPV vaccination (e.g., when countries transition from a two-dose to single-dose schedule), secure ongoing funding for refresher training.

MICROPLANNING FOR HPV VACCINATION

Microplanning for HPV vaccination is essential and should occur at the district, HF, and/or community levels. It should be part of EPI microplanning; at minimum, it should engage the health and education sectors (World Health Organization 2016). The microplanning process includes verifying the estimated target population (enumeration); ensuring that cold chain capacity is adequate; planning and coordinating logistics (especially for outreach and mobile services); and developing strategies to identify and reach girls who are out-of-school and those who are enrolled in school but were absent when the vaccine was administered.

Enumeration for HPV vaccination typically involves healthcare workers and school staff identifying and making lists of all girls who are eligible to receive the vaccine. The total number of girls is reported to staff at the regional/provincial then national level. Accurate RI enumeration is a difficult undertaking for many countries and the same is true for HPV vaccination. Challenges related to determining the target population of girls ages 9–14 can affect coverage calculations and estimates of the number of doses required. Enumeration can also be problematic in countries that have a large number of out-of-school girls.

Challenges with HPV vaccination enumeration can also include how to count girls whose year of birth is unknown; inadvertently missing those who are vaccine eligible; identifying and estimating the number of hard-to-reach girls; and poor enumeration training practices. To mitigate these issues, countries can use strategies such as implementing nationwide microplanning templates; ensuring that all enumerators

receive adequate training; and enhancing coordination between departments and organizations engaged in enumeration. Once identified, invite hard-to-reach girls and their caregivers to an HF or school to be vaccinated or include them in outreach immunization services.

WHO guidance on determining target populations and denominators for HPV vaccination recommends the use of estimates from national statistical offices (NSOs) (World Health Organization 2020b). Because census data is not collected frequently and in most cases is not disaggregated by a single age, there are limitations to its use in HPV vaccination enumeration. However, in Malawi, a post-introduction verification exercise to validate the eligibility of girls registered during the initial mapping process showed that using NSO projections was a reliable strategy for estimating future cohorts for HPV vaccination (Hausi et al. 2021). Some countries have begun asking their NSO for age-specific data to support efforts like enumerating girls ages 9–14 for HPV vaccination.

Some countries are able to develop more accurate estimates for school-based vaccine delivery using school headcounts or register checks in conjunction with school enrollment records. Registering eligible girls for HPV vaccination before school vaccination days also helps determine dose requirements.

In countries where HF staff implement school-based HPV vaccination, the HF/health district must ensure that it is sustainably resourced and tracked annually. When developing microplans for delivering the vaccine in schools, HF budgets should include costs associated with ongoing communications and planning sessions with school staff. In countries that have well-established school health programs, microplanning for HPV vaccination can be integrated with school health program planning.

The WHO guide *Microplanning for Service Delivery Using the Reaching Every District (RED) Strategy* describes how to develop HF-level microplans for RI and use them to inform district-level microplans. Much of the information and resources in the document, which includes templates and answers to frequently asked questions, are relevant for HPV microplanning.

Examples of national approaches to HPV vaccination microplanning follow.

In **India**, the Ministry of Health's EPI developed and distributed HPV-specific standardized forms for enumerating the target population and recording vaccine doses administered. These data are reported from HFs to the district and state levels (Ahmed et al. 2022).

In **Tanzania**, the HPV vaccine is available as a part of RI to a single-age cohort of 14-year-old girls. Before rollout, health workers at the national, regional, council, and HF levels and school personnel attended microplanning workshops (Mphuru et al. 2022).

In **South Africa**, to prepare for a national HPV vaccination campaign, every province and district appointed a coordinator to lead microplanning activities at each vaccination site. The coordinators were responsible for determining and reporting vaccine doses and resource needs (Delany-Moretlwe et al. 2018).

In **Zimbabwe**, during microplanning (prior to nationwide introduction of the HPV vaccine), school health coordinators compiled lists of eligible girls and maintained registers, while community health workers identified and encouraged out-of-school girls to receive the vaccination, and HF staff developed weekly immunization plans. These data were reported up to the district, provincial, and national levels and used to inform the vaccine supply distribution plan (Carlton et al. 2022).

Essential Document on Microplanning

- Microplanning for Immunization Service Delivery Using the Reaching Every District (RED) Strategy, 2009

Key Consideration for Microplanning

- In general, countries should use NSO data for HPV vaccination microplanning.

ROUTINE MONITORING AND EVALUATION

Monitoring and evaluation are crucial components of HPV vaccination. Monitoring vaccination program coverage and performance is essential to determine its effects, identify gaps, improve uptake, and strengthen microplanning. Every HPV vaccination program should also evaluate its feasibility and outcomes, assess healthcare provider and public understanding of cervical cancer and the HPV vaccine, and measure vaccine acceptance among healthcare providers, community members, and key stakeholders.

Supportive supervision on HPV vaccination, Kenya

Data on HPV vaccination should be continuously compiled, analyzed, and used at national and subnational levels and discussed with local healthcare providers and educators. If low coverage or a high dropout rate is recognized early, targeted solutions can be developed in a timely manner, particularly when local stakeholders are actively involved.

Healthcare professionals at the HF level should use their local HPV vaccination data to analyze the HF's performance and take corrective action when coverage is lower than expected. As part of monitoring, some HFs display an HPV vaccination coverage wall chart that indicates the target population of girls in the HF or catchment area and the number vaccinated per month and dose over time.

The WHO RED guide provides five monitoring and evaluation steps: define the monitoring process; select indicators and targets; collect data and submit reports; analyze and interpret data; take action; and update the microplan ("Reaching Every District" 2017). Although this guide focuses on immunization for a range of vaccine-preventable diseases, the description of these steps is highly relevant for monitoring and evaluating HPV vaccination programs.

HPV vaccination programs should have a standard set of indicators for monitoring performance and an established process for reviewing indicator data from the point of service delivery to the national level. Ongoing data review gives health staff information about areas with low coverage and/or high dropout rates and facilitates identification of corrective actions.

HPV vaccination coverage and process indicators should be determined in part by the mode of service delivery (Ali et al. 2019). Sample indicators include:

- Coverage for each dose of the vaccine.
- Coverage for each dose administered by a healthcare professional for each delivery strategy (i.e., fixed, outreach, school-based).
- Number of vaccination sessions implemented according to plan by delivery strategy.
- Vaccination dropout rate.
- Percentage of caregivers who provide written consent, as applicable.
- Number and types of adverse events following immunization.
- Number of days the vaccine is stocked out.

Girls with their vaccination cards after receiving HPV vaccination

Immunization programs may develop HPV-specific tools or integrate HPV indicators into their RI system to collect and record vaccination data. While there may be operational challenges, RI tools and tracking systems (e.g., immunization registers, monitoring charts, tally sheets, immunization cards/home-based records, stock records) can typically be updated to include HPV vaccination (World Health Organization 2016). Whether new tools are developed or existing tools modified, involve health workers in decisions related to monitoring and evaluation tools because they use them on a regular basis.

Routine Tracking

Tracking is a consideration for countries that use a two-dose HPV vaccination schedule. Achieving high second-dose coverage requires following up to encourage girls to return for the subsequent dose. HF and school staff and community health workers should employ tickler files, HPV registers, and other defaulter tracking systems to follow up, including using short message service (SMS) reminders where possible.

Other approaches to improve second-dose coverage include conducting an annual school-based campaign combined with making the vaccine available at health clinics/posts for a limited time and having healthcare workers sensitize local leaders to the importance of the second dose. Another strategy is peer tracking in which health workers identify and vaccinate girls who have not completed their vaccination schedule and ask them to help locate peers who are also in need of a second dose (Bonner et al. 2017). Be sure to estimate in advance the time, finances, and human resources needed for this type of follow-up.

Essential Documents on Routine Monitoring and Evaluation

- HPV Vaccine Coverage Monitoring Manual, 2020
- A Guide for Conducting an Expanded Programme on Immunization (EPI) Review, 2022
- Guide to Introducing HPV Vaccine into National Immunization Programmes, 2016
- Reaching Every District (RED) - A Guide to Increasing Coverage and Equity in All Communities in the African Region, 2017
- WHO Human Papillomavirus (HPV) Vaccine Coverage Monitoring Manual, 2020

Key Considerations for Routine Monitoring and Evaluation

- It is critical to establish a standard set of HPV vaccination and performance indicators that is tracked and used at every level of the health system.
- Monitoring and evaluating can contribute to the evidence base of effective HPV vaccination program approaches.

COMMUNICATIONS AND SOCIAL MOBILIZATION

It is important to create and implement a communications and social mobilization strategy to introduce and sustain immunization services. To enhance demand, be sure that the intended audience's culture, needs, and practices inform service delivery; communications messages are clear and actionable; and strong partnerships with key stakeholders and communities are prioritized.

Use tools and approaches from behavioral sciences such as human-centered design to develop strategies to reach target populations, identify and address enablers and barriers to uptake, and gather community input on service delivery to improve its quality.

Individuals' interactions with health systems and the level of person-centered care present affect the uptake of health services, including immunization (World Health Organization 2015). The Immunization Service Experience Toolkit (JSI 2022) provides guidance for countries to prioritize people (e.g., health workers, clients, caregivers) and quality of care in immunization service delivery throughout the life course.

Before the vaccine is introduced and at regular intervals thereafter, subnational program staff should assess community knowledge and beliefs about HPV and the vaccine, and use this information to design communications strategies to dispel misconceptions, misinformation, and beliefs that are at odds with HPV vaccination.

The following section provides guidance on and examples of HPV vaccination communications efforts in LMICs.

Audiences and Messages

HPV vaccination uptake is influenced by adolescents', caregivers', and school staff awareness of the risks associated with HPV infection and cervical cancer and understanding of vaccine effectiveness (Patel and Berenson 2013).

A comprehensive HPV vaccination communications strategy incorporates methods to reach a wide range of stakeholders with clear messages (WHO 2017a). Communications should be tailored to the audience, easy to understand, translated into local languages, and include a clear call to action and government and partner logos. In terms of evaluating HPV vaccination communications, it can be challenging to quantify the effect of specific strategies on vaccine uptake because of the many variables that cannot be controlled.

Key communications message audiences include:

Adolescent girls: This population needs to understand what HPV and cervical cancer are and when and where they can be vaccinated. In some settings, it has been shown that girls can have significant influence on whether their parents allow them to be vaccinated. As described earlier, girls whose mothers talk with them about sex, contraception, and/or sexually transmitted infections are significantly more likely to initiate and finish the HPV vaccination series.

Caregivers: In most cases, caregivers must provide consent for their daughter to be vaccinated. When vaccination occurs outside school, it is common for mothers to accompany their daughters to the vaccination site. Caregivers must understand the vaccine's ability to prevent cervical cancer and be equipped with facts to refute misconceptions and misinformation that may circulate in their community. Communications messages to caregivers should clarify the government's support of the vaccine, why it is given to 9–14-year-old girls, and when and where it is offered. Caregivers should be encouraged to talk to healthcare providers (and school staff in school-based programs) if they have questions or concerns.

Male caregivers

HPV vaccination communications plans should consider local gender roles because in some countries men have more autonomy than women in decisions about family issues (Poole et al. 2013). In these settings, the father's approval for a daughter's vaccination is more important than the mother's. Additionally, a mother might require her husband's permission to take time from her household responsibilities to bring a daughter to a vaccination site (Adeyanju et al. 2021). In some cases, it may be necessary to design communications and social mobilization materials targeted to men.

Healthcare workers: Health workers must be well-versed in why the vaccine is needed and its effectiveness; why girls ages 9 to 14 should be vaccinated; and how to dispel vaccine misconceptions in the communities they serve. Healthcare workers must also know how to identify girls who are eligible to receive the vaccine.

School staff: Communications messages should familiarize teachers and other school staff—typically respected community members—with the importance and efficacy of HPV vaccination. While especially true for school-based vaccine delivery, messages should enable school staff to provide information about HPV, cervical cancer, why 9–14-year-old girls should be vaccinated, and where and when they can do so, regardless of where the vaccine is delivered.

The media: HF leaders should give local media representatives evidence-based information about cervical cancer and the benefits and safety of HPV vaccination and where to access the vaccine so they can disseminate timely accurate information about preventing HPV to the public.

In addition to these populations, sensitize religious and community leaders and political organizations to cervical cancer, HPV, and the vaccine prior to vaccine rollout.

Kenyan Health Workers and Teachers Use WhatsApp for HPV Vaccination Planning, Information Sharing, and Communications

Most countries use several channels, including parent-teacher meetings, healthcare worker presentations, posters and brochures, and mass and social media to communicate HPV infection and vaccine information (Tsu et al. 2021). Kenya uses a mix of methods, including WhatsApp groups for healthcare workers and teachers to facilitate peer learning about the vaccine. WhatsApp groups are also used to share information about events such as parent teacher association meetings at which healthcare workers talk about HPV and the vaccine. Healthcare professionals also use WhatsApp to coordinate vaccination dates with school staff.

Sample HPV Communications Messages and Materials

Many countries have designed and implemented HPV communications messages for a variety of audiences.

The following are a few examples.

Country: Côte d'Ivoire

Target Population: Adolescent girls and communities

What: The country's EPI adapted the Girl Focus Toolkit HPV Campaign Resource to implement a digital communications campaign (Girl Effect and Gavi n.d.). Animations designed to appeal to girls were shared on the EPI's social media pages. A YouTube video about the vaccine was created and posters, bracelets, radio spots, and stickers helped to spread the word about the vaccine.

Country: Zimbabwe

Target Population: Caregivers

What: A fact sheet about cervical cancer, HPV, and the vaccine was developed and disseminated. It addresses common misconceptions and fears by explaining what the HPV vaccine cannot do and is branded with government and partner logos (Zimbabwe Ministry of Health and Child Care n.d.).

Country: Tanzania

Target Population: Caregivers and advocates who have access to a vehicle

What: The EPI developed a tire cover as a part of an HPV vaccine communications campaign. It urges caregivers to protect their daughters from cervical cancer by getting them vaccinated (Tanzania Ministry of Health 2018).

Country: Rwanda

Target Population: Adolescent girls

What: Ni Nyampinga, a communications platform that includes a youth-branded magazine for girls and boys, parents, teachers, and community leaders, featured an article encouraging girls to receive the HPV vaccine (Icyizere 2020).

In Senegal, the 2016 National HPV Communications Plan featured HPV vaccination communications messages for ministries (Education, Interior, Youth, and Women) and professional associations (midwives, female doctors, and gynecologists). The messages focused on the national burden of disease, the vaccine's effect on cervical cancer morbidity and mortality, and the high cost of treating cervical cancer. The messages were presented at a launch ceremony in each region that involved local administrative authorities, and recordings by the first lady, the Ministry of Health and Social Action, religious leaders, traditional communicators, artists, and athletes were broadcast on the radio (Senegal Ministry of Health and Social Action 2016).

Misinformation, Fears, and Misconceptions

It is important to dispel misinformation and fears related to HPV vaccination (Girl Effect and Gavi n.d.). It is common to hear concerns about the young age of vaccine recipients, the vaccine's association with sexual activity, and its potential consequences for girls' fertility. As soon as rumors appear in communities, HPV programs should respond by communicating the facts through a variety of channels. Messages that focus on the vaccine's ability to prevent cervical cancer and avoid discussing sexuality are often well received.

Essential Documents on Communications and Social Mobilization

- Vaccination Demand Hub: Service Experience, 2022
- Behavioral Interventions to Increase Vaccine Demand, 2022
- Human-Centred Design 4 Health, n.d.
- Social Mobilization Guide for Vaccination Campaign and Routine Immunization, n.d.
- WHO HPV Vaccine Communication: Special Considerations for a Unique Vaccine, 2016
- Reaching Every District (RED) - A Guide to Increasing Coverage and Equity in All Communities in the African Region, 2017
- Girl Focus Toolkit HPV Campaign Resource, n.d.
- Creating Demand for the HPV Vaccine through Girl-Centred Communications, n.d.
- Vaccine Misinformation Management Field Guide, 2020.
- Field Guides: Global HPV Communication, 2018.

Key Considerations for Communications and Social Mobilization

- Before planning and implementing communications efforts, conduct formal or informal surveys to understand the community's knowledge and attitudes about HPV, cervical cancer, and the vaccine.
- HPV communications should address all relevant populations, including adolescent girls, caregivers (men and women), school staff, healthcare workers, and other stakeholders.

Adolescent and pre-adolescent girls in India

PHOTO CREDIT: ADAM COHN

CONCLUSION

Although almost entirely preventable, cervical cancer, with over 300,000 deaths occurring every year, is the fourth-leading cause of cancer mortality in women. More than 90 percent of cervical cancer deaths worldwide occur in LMICs. HPV vaccination is critical to reducing those deaths. The efficacy of HPV vaccines caused the World Health Organization in 2016 to release the "Global Strategy to Accelerate the Elimination of Cervical Cancer As a Public Health Problem."

This is a promising time in cervical cancer prevention and HPV vaccination in LMICs, as more countries introduce and scale up vaccination for girls ages 9–14; new vaccines come to market; countries begin to adopt a single-dose vaccination schedule; and innovative service delivery strategies, such as integrating the vaccine with other adolescent health services, advance.

All of these developments—and more—must be leveraged to overcome formidable and persistent challenges to identifying and encouraging out-of-school and hard-to-reach girls to be vaccinated; verifying estimated target populations; finding sustainable approaches to HPV vaccination training and supportive supervision for healthcare professionals; increasing use of standard HPV vaccination coverage and process indicators to monitor and evaluate programs; and correcting widespread misinformation and myths associated with HPV vaccination.

It is our hope that this resource guide contributes to the growing body of strategies to make HPV vaccination service delivery equitable, sustainable, and replicable so that we can attain the goal of eliminating cervical cancer across the globe.

RECOMMENDED OVERARCHING HPV VACCINATION RESOURCES

Girl Focus Toolkit HPV Campaign Resource, n.d.

A Guide for Conducting an Expanded Programme on Immunization (EPI) Review, 2022

Guide to Introducing HPV Vaccine into National Immunization Programmes, 2016

HPV Vaccine Communication: Special Considerations for a Unique Vaccine, 2016

HPV Vaccine Coverage Monitoring Manual, 2020

HPV Vaccine Introduction Clearing House

Meeting of the Strategic Advisory Group of Experts on Immunization, April 2022: Conclusions and Recommendations

Reaching Every District (RED) - A Guide to Increasing Coverage and Equity in All Communities in the African Region, 2017

School Vaccination Readiness Assessment Tool, 2013

TechNet 21 - HPV Introduction: Technical Resources

Considerations Regarding Consent in Vaccinating Children and Adolescents Between 6 and 17 Years Old, 2014

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