

HPV Vaccination in Southeast Asia

LESSONS LEARNED FROM A PILOT PROGRAM IN VIETNAM



NATIONAL INSTITUTE OF
HYGIENE AND EPIDEMIOLOGY



PATH
A catalyst for global health

HPV Vaccination in Southeast Asia

LESSONS LEARNED FROM A PILOT PROGRAM IN VIETNAM

NOVEMBER 2012

PATH is an international nonprofit organization that transforms global health through innovation. We take an entrepreneurial approach to developing and delivering high-impact, low-cost solutions, from lifesaving vaccines and devices to collaborative programs with communities. Through our work in more than 70 countries, PATH and our partners empower people to achieve their full potential.

Headquartered in Seattle, Washington, PATH operates offices in 33 cities in 22 countries. PATH currently works in the areas of health technologies, maternal and child health, reproductive health, vaccines and immunization, and emerging and epidemic diseases.

For more information, please visit www.path.org.

The global *HPV Vaccines: Evidence for Impact* project was implemented by PATH and our partners and was funded in whole by a grant from the Bill & Melinda Gates Foundation. The views expressed herein are solely those of the authors and do not necessarily reflect the views of the Foundation.

Copyright © 2012, Program for Appropriate Technology in Health (PATH). All rights reserved. The material in this document may be freely used for educational or noncommercial purposes, provided that the material is accompanied by an acknowledgment line.

For more information, please contact:

PATH

Mailing address:

PO Box 900922
Seattle, WA 98109

Street address:

2201 Westlake Avenue
Suite 200
Seattle, WA 98121
Tel: (206) 285-3500

info@path.org

www.path.org/cervicalcancer

RHO Cervical Cancer resource library: www.rho.org

Suggested citation: PATH, National Institute of Hygiene and Epidemiology (NIHE), and the National Center for Health Education and Communication (NCHC). HPV Vaccination in Southeast Asia: Lessons Learned from a Pilot Program in Vietnam. Seattle: PATH; 2012.

Cover photo: PATH/Le Thi Nga

Acknowledgments

This document is a synthesis of the research reports:

PATH. *Evaluating different HPV vaccine delivery strategies in Vietnam 2008-2010: Coverage, acceptability, KAP, feasibility, and cost results*. Seattle: PATH; 2012.

PATH and Vietnam National Institute of Hygiene and Epidemiology. *Evaluating HPV Vaccine Delivery Strategies in Vietnam*. Seattle: PATH; 2010.

The demonstration project and operations research that serve as the basis for all documents were implemented by the National Institute of Hygiene and Epidemiology (NIHE) in collaboration with PATH and the National Center for Health Education and Communication (NCHC), as part of the *HPV Vaccines: Evidence for Impact* project. This work was supported by a grant from the Bill & Melinda Gates Foundation.

We would like to thank all those who contributed to the demonstration project and operational research in Vietnam:

- The Socialist Republic of Vietnam: senior officials and staff from the Ministry of Health; its departments: NIHE leadership, especially Dr. Nguyen Tran Hien, from NEPI, Dr. Nguyen Cuong, vice director, and Dr. Dang Thi Thanh Huyen, senior program officer, and from NCHC, Dr. Nguyen Kim Lien.
- Leaders of the Provincial Health Services, Preventive Medicine Centers (PMC) and Provincial Centers for Health Education and Communications in Thanh Hoa and Can Tho; and leaders of the District People's Committees, District PMCs, commune health centers, secondary schools, and Women's Union Committees of the communes in Nong Cong and Quan Hoa (Thanh Hoa province), Ninh Kieu, and Binh Thuy (Can Tho province).
- PATH, especially Allison Bingham, Mona Byrkit, Jane K. Cover, Aynnah Janmohamed, Le Thi Nga, Nguyen Thi Ngoc Diep, Nguyen Quy Nghi, Ngo Thi Kim Hoa, D. Scott LaMontagne, Carol Levin, Proma Paul, Vivien Tsu, Scott Wittet, and consultants Bu Thi Than Mai, and Tran Hung Minh from the Consultation of Investment in Health Promotion (CIHP).
- Merck & Co., Inc. for donations of HPV vaccine used in the project.

This report was prepared by Dr. Marjorie Murray of PATH. The teams at PATH, NIHE, and NCHC provided technical review of this document. The report was designed by Patrick McKern and proofread by Rica Asuncion.

We would also like to acknowledge the administrative support received throughout the research process from Adam Drolet and Rica Asuncion.

Finally, we would like to express our gratitude to the parents, guardians, children, teachers, community leaders, health workers, and local, district, and national leaders who participated in the project and shared their time and thoughts to help us understand the issues.

Contents

Executive summary	5
Introduction	8
Lessons learned: Developing and implementing an HPV vaccination strategy	11
Target groups and venues for vaccination	11
Operational issues	13
Lessons learned: Training, community mobilization, and information and education	17
Health worker and teacher training	17
Community outreach	18
Messaging	20
Conclusion	22
References	24



School girls in Hoa Binh, Vietnam.

PAT/Amynah/Janmohamed

Executive summary

Two vaccines to prevent human papillomavirus (HPV) infection, the primary cause of cervical cancer, are now approved for use in more than 120 countries. The availability of these safe and highly efficacious vaccines presents an exceptional opportunity to advance women's health, particularly in low-resource settings. However, low- and middle-income countries, where women are most likely to die of the disease, often face significant obstacles to integrating new vaccines into their national immunization programs. People living in these countries often must wait many years for access to life-saving interventions available in higher-income settings.

In 2006, PATH initiated the *HPV Vaccines: Evidence for Impact* project to generate the critical evidence and experience for informed public-sector introduction of HPV vaccine for improved cervical cancer prevention.¹ PATH collaborated with the governments of four countries—India, Peru, Uganda, and Vietnam—to implement the project in selected areas so that policymakers and program planners would have the information they need to determine when and how best to introduce HPV vaccine nationwide. The experience of these countries also will be helpful to other countries in their regions that may want to include HPV vaccinations in their national programs.

In Vietnam, the National Institute for Hygiene and Epidemiology (NIHE) within the Ministry of Health and PATH identified and tested strategies for HPV vaccine delivery in urban, rural, and mountainous areas reflecting the diverse geography of the country. The National Center for Health Education and Communication (NCHEC), also within the Ministry of Health, conducted information, education, and communication (IEC) activities for the project. While PATH led the evaluation of the project, both NIHE and NCHEC were consulted during the evaluation design phase.

Through a vaccination demonstration project carried out from 2008 to 2010, more than 6,300 girls aged 11 years (or in grade 6) received all three doses of the vaccine. Two vaccine delivery strategies were implemented. In the first, vaccinations were conducted at schools for girls enrolled in grade 6, with active outreach later in health centers to vaccinate girls who had been missed. In the second strategy, girls aged 11 years were vaccinated at commune health centers. These two strategies were applied in urban, rural, and mountainous regions. Vaccination activities were conducted through the National Expanded Program on Immunization (NEPI), making use of the personnel, systems, and structures normally used for activities such as training health workers, delivering vaccines, maintaining the cold chain, and monitoring adverse events.

Evaluation of the project showed that high vaccine coverage was achieved through both of the delivery strategies. The health and education sectors collaborated effectively regardless of strategy. This cooperation, along with participation from community-based organizations, led to program success. Health workers were provided information and skills needed for the HPV vaccination program, and these skills proved useful for their other, routine activities. The project had some impact on regular activities at commune health centers and schools, but no negative impact on transport and storage of other NEPI vaccines was observed after the

addition of HPV vaccine to the system. High vaccine acceptability within communities was achieved by targeted messages developed from formative research conducted prior to vaccine implementation.

Lessons learned from the Vietnam project can inform plans to introduce HPV vaccine or other new vaccines into routine government programs, and also may be applicable in other countries with similar cultural, economic, and health-system contexts. This report interprets project results and summarizes helpful lessons for policymakers and program managers hoping to implement HPV vaccination programs.

Lessons learned: Developing and implementing an HPV vaccination strategy

TARGET GROUPS AND VENUES FOR VACCINATION

- Lesson 1:* Both school-based and commune health center-based strategies can achieve high vaccine coverage.
- Lesson 2:* The six-month vaccination schedule must be coordinated with the school-year schedule, and the timing of sessions should avoid major disruptions of school activities.
- Lesson 3:* Creating a list of eligible girls prior to vaccination takes extra effort but helps to facilitate program implementation.

OPERATIONAL ISSUES

- Lesson 4:* Formative research is an effective means of gathering information that can guide development of a successful HPV vaccine introduction strategy.
- Lesson 5:* Strong partnerships across sectors—including the Ministry of Health, Ministry of Education, and community organizations—lead to effective implementation.
- Lesson 6:* Introducing a new vaccine can strengthen many functions of the health system, including vaccine education and communication, health worker training, and compliance with Ministry of Health regulations concerning immunization.
- Lesson 7:* Careful assessment and management can ensure that the cold chain and transport systems are not overburdened by the addition of HPV vaccine.
- Lesson 8:* Immunization microplanning is an essential process for vaccine introduction and is especially important in areas where there is considerable population movement.
- Lesson 9:* While the workload for health center staff and teachers will increase due to their participation in HPV vaccination activities, the extra duties are manageable because they occur only three times per year (according to the vaccine delivery schedule).
- Lesson 10:* Integrating HPV vaccination work into an existing system may reduce costs to an affordable level.

Lessons learned: Training, community mobilization, and information and education

HEALTH WORKER AND TEACHER TRAINING

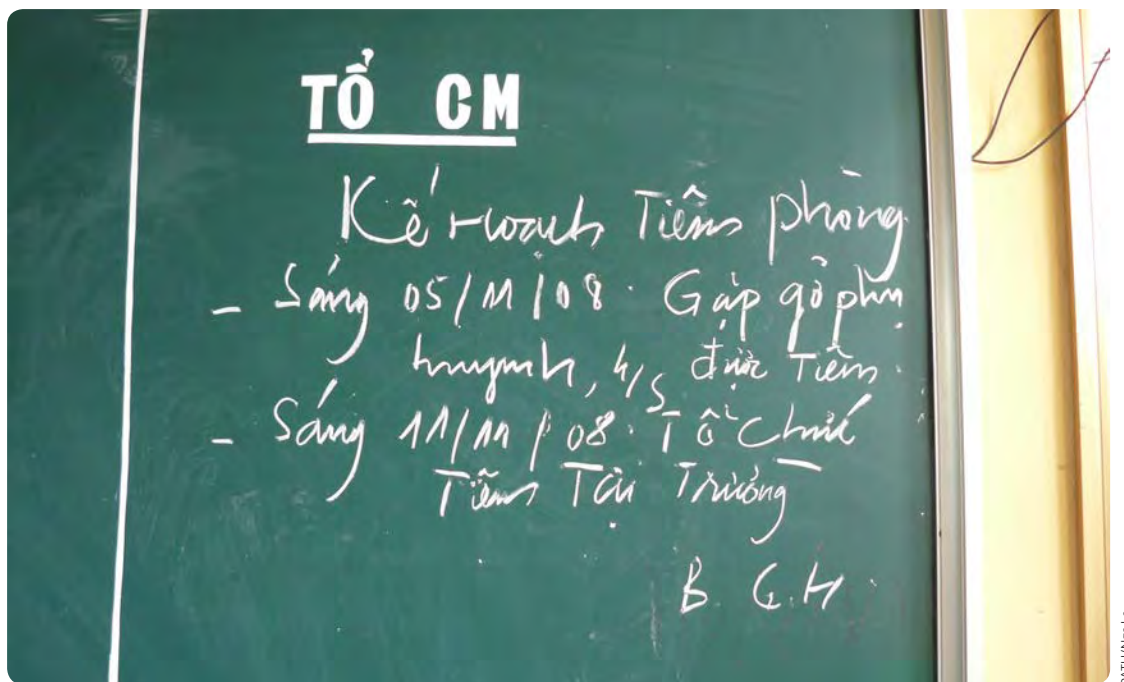
- Lesson 11:* Training methods and materials should be developed and schedules for training should be set up well in advance of the first training sessions.
- Lesson 12:* Separate training sessions for teachers and health workers allow for a focus on their specific roles.

COMMUNITY OUTREACH

- Lesson 13:* Tailoring methods and messages for specific audiences and planning well in advance are essential to successful community sensitization and mobilization.
- Lesson 14:* The visible involvement of government agencies demonstrates that a vaccination program has official support and increases community participation.
- Lesson 15:* Participation of community leaders is essential to acceptance of the program.

MESSAGING

- Lesson 16:* Describing HPV vaccine as a “cervical cancer vaccine” facilitates understanding by the public, focuses interest on preventing disease, and provides a building block for messages.
- Lesson 17:* Messages should be based on an understanding of the information needs of different audiences, such as parents, girls, community groups, and community leaders.
- Lesson 18:* Refusal to accept HPV vaccination often is due to confusion or misinformation.



HPV vaccine announcement on school chalkboard.

Introduction

Human papillomavirus (HPV) infection causes cervical cancer, a preventable disease that each year affects an estimated 529,000 women worldwide and leads to more than 275,000 deaths, with 88 percent of these in low-income countries.⁶ Cervical screening identifies precancerous lesions that can occur after HPV infection. Regular screening for lesions, with treatment when needed, has been the key to lowering the rates of cervical cancer incidence and death in high-income countries. But many countries with limited resources lack the infrastructure and systems needed to support effective screening services, and very few women ever are screened.

The availability of two safe and effective vaccines to prevent HPV infection and precancerous lesions presents an exceptional opportunity to advance women's health, particularly in low-resource settings. The vaccines are now approved for use in more than 120 countries. Unfortunately, low- and middle-income countries often face significant obstacles to integrating new vaccines into their national immunization programs, and people living in these countries often must wait many years for access to life-saving interventions available in higher-income settings. Policymakers increasingly are seeking information and recommendations on whether and how to incorporate HPV vaccination into their health systems.

Unique characteristics of HPV vaccines

Although countries often face a set of common challenges when introducing new vaccines into their national immunization programs (including financing, health worker training, strengthening cold chain and storage capacity, and educating communities), some attributes of HPV vaccines require special consideration:

- **Optimal age range for vaccination:** HPV vaccines are more than 90 percent effective in preventing infection with the two types of HPV that cause about 70 percent of cervical cancer cases (HPV-16 and -18)—but only in girls and women with no prior HPV-16 or -18 infection.⁷⁻¹¹ Because peak incidence of HPV infection occurs soon after the onset of sexual activity, immunization should occur before sexual initiation. Therefore, young adolescent girls (aged 9 to 13 years) comprise the appropriate target group for HPV vaccination, as recommended by the World Health Organization.¹¹ Adolescents are not routinely targeted for multi-dose vaccinations, so new approaches to reaching them may be necessary.
- **Sex:** HPV infection is common among men and women. However, while men can transmit HPV, they cannot develop cervical cancer. The potential benefits of vaccinating girls are clear; the benefits of also vaccinating boys are still under investigation.¹⁴
- **Sexually transmitted infection and disease of the reproductive system:** HPV is a sexually transmitted infection, and parents in some high-resource countries have expressed concern that the vaccine might encourage early initiation of sexual activity, even though there is no evidence to suggest this has occurred after HPV vaccination.¹⁵⁻¹⁸ Further, because the cervix is part of the reproductive system, some concern has been voiced that the vaccine might adversely affect girls' future fertility. Both of these possible concerns should be taken into account when planning HPV vaccination programs.
- **Long delay in benefit:** Many vaccines prevent diseases that progress rapidly in young children; by contrast, cervical cancer does not usually develop until a woman is an adult, decades after the target age of vaccination. The benefits of HPV vaccination are therefore less immediate than those of other vaccines.

In 2006, to help policymakers and health program planners worldwide make informed decisions regarding regional and national HPV vaccine introduction, PATH initiated the *HPV Vaccines: Evidence for Impact* project in selected areas of four low- and middle-income countries. The goals of the project were to generate evidence for decision-making and operational planning and to address information needs for introducing HPV vaccination into public-sector programs.¹ Vietnam was one of the countries chosen as a site for the project, along with India, Peru, and Uganda. Prior to development of the demonstration projects, PATH negotiated an agreement with the two HPV vaccine manufacturers (Merck & Co., Inc. and GlaxoSmithKline) to provide vaccine for the projects free of cost and without any conditions related to project design or data use, as long as vaccine was used according to approved indications and after the vaccines had been licensed in the countries involved.

In the first phase of the project, formative research was conducted to build understanding of critical issues that could affect vaccine delivery.^{12,13} This research found that Vietnam had a strong immunization delivery system in place, as well as communities and policymakers receptive to the idea of a vaccine to prevent cervical cancer. It also identified the gap areas where further information, education, and communication (IEC) on cervical cancer and its prevention were needed. These results informed the design of the strategies and tools that were implemented in the second phase of the project, evaluation of different HPV vaccine delivery strategies in Vietnam, also called the demonstration project.

Two vaccine delivery strategies in Vietnam

Two different vaccine delivery strategies were implemented in Vietnam. In the first strategy, vaccinations were conducted at schools for girls enrolled in grade 6, with active outreach later in health centers to vaccinate girls who had been missed. The second strategy vaccinated girls aged 11 years at commune health centers. These two strategies were applied in urban, rural, and mountainous locations (see map).

HPV vaccination sessions were arranged either the day before or the day after regularly scheduled vaccination days for routine infant immunizations. Prior to the HPV vaccination day, health workers checked the lists of eligible girls, assembled vaccine and immunization materials, and assigned specific tasks to staff.

For the school-based strategy, health workers worked with the head of the school and grade 6 teachers to prepare the vaccination site. A library, meeting room, or office of the head of the school was reorganized as an injection room, and school staff arranged waiting and post-vaccination observation and rest areas. School heads and grade 6 teachers facilitated the participation of eligible girls and assisted with post-vaccination observations.

For the health facility-based strategy, health workers prepared the vaccination sites. On vaccination day, communicators and community leaders sometimes provided additional support, and girls' parents or grandparents brought them to the appropriate health facility.



The demonstration project was implemented in Vietnam by the National Institute for Hygiene and Epidemiology (NIHE), the National Center for Health Education and Communication (NCHEC), and PATH from 2008 to 2010. Because the existing immunization system appeared adequate for including HPV vaccine delivery, the demonstration project in Vietnam investigated how that system could be used to provide HPV vaccine to young adolescent girls and how delivery of the vaccine could be integrated into the National Expanded Program on Immunization (NEPI). The National Center for Health Education and Communication (NCHEC) conducted information, education, and communication activities that were essential to sensitizing and mobilizing communities prior to vaccinations.

After each year of vaccinations, PATH, in collaboration with NIHE and NCHEC, conducted evaluations of the vaccine delivery strategies. Qualitative and quantitative data were collected to assess coverage, acceptability, feasibility, and costs of the two delivery strategies. The detailed results of evaluations are available in the peer-reviewed literature.²⁻⁵ This report interprets project results and summarizes helpful lessons for policymakers and program managers. Lessons learned in Vietnam may be useful for other countries that are hoping to implement HPV vaccination programs and have similar sociocultural, policy, and health-system environments.

Summary of results from Vietnam's demonstration project

- **Coverage:** During a two-year period, 6,358 of 7,016 eligible girls were vaccinated with three doses of HPV vaccine in two districts of Thanh Hoa province and two districts of Can Tho province. Overall, coverage achieved in the school-based delivery in the second year (96 percent) was not statistically different from that achieved in the commune health center-based strategy (99 percent).²
- **Acceptability:** High vaccine coverage indicated that acceptability of the vaccine was high. Parents in Vietnam were motivated to allow their daughters to receive HPV vaccine by health-related reasons and by the involvement of the government (NEPI and NCHEC) in the vaccine program. Those who declined participation were influenced by concerns about vaccine safety and side effects. Like parents in high-resource settings, many Vietnamese parents are active decision-makers, seeking out a number of sources of information to inform and confirm their vaccination decisions.^{3,4}
- **Feasibility:** The HPV vaccine program applied a training-of-trainers model with mixed groups of participants, which allowed training of a large number of staff at local levels in a short period of time. Content and materials were tailored for the needs of specific target groups. As with all new programs, HPV vaccination temporarily disrupted health and education systems to some extent, but the majority of health care providers, teachers, and others spoke of their involvement in the program in positive terms. Support from local authorities and smooth, cross-sector collaboration were key factors for success.
- **Cost:** The total economic cost per dose of delivering HPV vaccine was US\$2.08 in the school-based strategy and US\$1.92 in the health center-based strategy (in US\$ 2009). Start-up costs comprised the highest part of economic costs, and when these were subtracted, economic cost per dose was US\$1.15 for both school- and health-center based programs.⁵

LESSONS LEARNED:

Developing and implementing an HPV vaccination strategy

Target groups and venues for vaccination

LESSON 1: Both school-based and commune health center-based strategies can achieve high vaccine coverage.

High coverage was attained in both the school-based and health center-based strategies. All sites showed improvement during the second year of the project, and in the final analysis, there was no significant difference between the coverage in the two strategies. The drop-out rate between doses was very low—less than one percent for the second and third doses of vaccine.

The main difference between the two strategies was vaccination location (school or health center). Other programmatic aspects, such as IEC activities and training, were similar in all sites. The school-based strategy raised awareness of the benefits of vaccination among teachers and girls. Health workers and teachers found it more efficient to vaccinate large numbers of children at school.

Since both strategies are feasible and can yield potentially high coverage rates, the choice of strategy for HPV vaccination in Vietnam or other countries with similar health and school systems can be based on factors that will optimize the use of available resources.



HPV vaccination in Nong Cong district school.

LESSON 2: For the school-based delivery strategy, the six-month vaccination schedule must be coordinated with the school-year schedule, and the timing of sessions should avoid major disruptions of school activities.

In the first project year, vaccination schedules were not always well synchronized with school schedules; for example, some sessions were conducted during exam periods. In the second year, vaccination activities were more carefully planned around school schedules.

The most frequently cited impacts of vaccination sessions at schools were on the learning activities of students, school events, and the volume of work for teachers. Due to the shortage of physical space, many schools mobilized meeting rooms or libraries for vaccination days, and consequently, academic activities in these locations were disrupted on vaccination days.

To avoid disturbance of important classes, some teachers suggested that students receive their vaccinations during a “less important lesson” in the schedule, and many schools organized vaccination sessions outside of usual school hours. Most teachers said that prevention of cervical cancer was worth the temporary disruption and inconvenience to the school schedule and that they would be willing to participate again in HPV vaccinations.

Before immunization days are scheduled, planners should first assess school facilities to see whether immunization sessions can be accommodated. Then careful attention should be directed to the school schedule for holidays and exam periods, as well as daily lessons, in order to minimize disruptions and ensure that girls can be reached.

LESSON 3: Creating a list of eligible girls prior to vaccination takes extra effort but helps to facilitate program implementation.

Lists of all eligible girls were made in advance of vaccinations, as this was important for verifying that the appropriate population was vaccinated and that correct amounts of vaccine, equipment, and supplies were in place. Teachers and health workers noted that this created extra work, but that it was an important part of the process.

In Vietnam, lists are kept of all babies born in each commune and names are registered with authorities to ensure that health services teams can provide the necessary vaccinations and other health care. Other countries may also have vaccination registers, or may find it useful to create them.

Because the target age group (11-year-old girls) for HPV vaccinations is different from that for routine Expanded Program on Immunization (EPI) programs, identifying eligible girls is an important task. In any areas where populations are migratory, it is a good idea to check the lists of girls before each dose, since families may move in and out of the area over the six-month vaccine-dosing period.

Operational issues

LESSON 4: Formative research is an effective means of gathering information that can guide development of a successful HPV vaccine introduction strategy.

Formative research conducted as the first part of the HPV vaccination project in Vietnam focused on the values, attitudes, and behaviors of the target audience as well as on the structure and functioning of the health system and the requirements of national health policies. Findings from this research played a crucial role in the design of the two delivery strategies and of the key elements of the communication plan, which the project used to sensitize and mobilize the community.¹²

A new HPV vaccination program in any country will benefit from audience and systems research conducted prior to vaccine launch. Resources available and the level of evidence required for planning a vaccination program will vary by country and program, but even a modest research effort will help to lay a solid foundation for the design of effective programs to reach young adolescent girls.^{19,20}

LESSON 5: Strong partnerships across sectors—including the Ministry of Health, Ministry of Education, and community organizations—lead to effective implementation.

At the provincial level, collaboration between Ministry of Health departments focused on broad issues such as policies to facilitate project implementation at lower levels. The immunization department (NEPI) played the key implementation role at the provincial level, while the health promotion department (NCHEC) trained and mobilized community IEC workers and schools provided support. It was important to have representatives from all three sectors agree on clearly stated roles and responsibilities of each party in the project to avoid duplication or misunderstandings. Overall, the HPV vaccination program strengthened the partnerships between the health and education sectors.

Participation of local authorities, especially leaders from organizations such as commune People's Committees and Women's Unions, was essential for smooth implementation. People's Committee leaders not only mobilized other organizations, but also directly launched the HPV vaccination campaign and actively supervised and encouraged project implementers during the initial vaccination days.

An HPV vaccination program design should involve stakeholders at all levels and enable a partnership among them. At the national level, collaboration among sectors can be fostered if there have been positive long-term relationships in the past. Careful coordination between school officials, health promotion staff, and health workers is important for IEC activities and community mobilization.

LESSON 6: Introducing a new vaccine can strengthen many functions of the health system, including vaccine education and communication, health worker training, and compliance with Ministry of Health regulations concerning immunization.

Health workers reported that training for HPV vaccinations strengthened the capacity of staff at various levels, in areas such as immunization skills, planning and monitoring activities, vaccination waste management, communication skills, and community mobilization. Consistent supportive supervision provided guidance on Ministry of Health regulations. Leaders of various agencies confirmed that the HPV vaccine project provided a chance to standardize staff knowledge and skills.

Many participants confirmed the applicability of project training to activities other than HPV vaccine-related work, for example, general counseling, dengue fever activities, and family planning communications. Most participants said they were able to produce a better work plan following the training and that they were more confident and could provide higher quality services in their daily activities.

Intensive training and supervision for introducing HPV vaccination into country programs can help workers at the local level become more confident in performing their assignments. Supportive supervision should be included as a key assignment for designated health workers and should be detailed in a written plan.

Training for HPV vaccination improved general knowledge and skills of health workers

Leaders at several levels confirmed that the *HPV Vaccines* project provided a chance to standardize the skills and capacity of staff. Health workers noted that training for HPV vaccinations carried over into their other duties, as evidenced by the following comments:

“Beside the improvement of knowledge in HPV vaccine, our health staff have better skills in immunization planning, not just for HPV vaccine but also for other EPI vaccines.”

–*Trainee in Thanh Hoa*

“After the training, I could see that my knowledge about planning was improved and I could make a better plan for immunization. In addition, I feel more confident when giving injection of the vaccine because I had been trained how to carry out safe immunization.”

–*Trainee in Thanh Hoa*

“In the past, we talked and talked without knowing what should be first and what should be last. After the training, we could communicate more professionally. For example, we prepared ourselves before going to talk with people from the community; we listened to them, learned to understand them, and then held discussions with them to determine any changes in behavior.”

–*Trainee in Can Tho*

LESSON 7: Careful assessment and management can ensure that cold chain and transport systems are not overburdened by the addition of HPV vaccine.

NEPI staff at all levels of the health care system were responsible for examining cold chain capacity, and their assessment informed the plan for distribution, transport, and storage of vaccine and other supplies to introduce the HPV vaccine. Most participants said that vaccine was transported and stored following standard regulations and that activities were well supervised. Health workers greatly appreciated the fact that the transport and storage procedures for HPV vaccines followed usual Ministry of Health guidelines.

While consideration of impacts on routine health center activities is important when evaluating the feasibility of an HPV vaccination program, logistical issues, such as integrity of the cold chain, and vaccine storage and transport, are also critical elements.

LESSON 8: Immunization microplanning is an essential process for vaccine introduction and is especially important in areas where there is considerable population movement.

The microplanning process includes scheduling dates for each of the key activities in implementation of an immunization program, such as training health workers, sensitizing and mobilizing communities, delivering vaccines and injection materials, and monitoring all processes. NIHE and PATH organized 15 planning workshops (8 in the first year and 7 in the second) for provincial and district staff in order to prepare for vaccination in the provinces. At the local level, commune health center staff organized meetings with representatives from the commune People's Committees and Women's and Youth Unions to plan for HPV vaccination. This microplanning helped ensure that the project would run smoothly.

In rural and mountainous areas of Vietnam, workers in health centers put extra effort into registering and keeping track of migratory clients and in working with impoverished, less-educated families. Careful monitoring before, during, and after vaccination sessions was important in order to verify that girls were eligible and were receiving the correct dose of the vaccine series.

Stakeholders included in microplanning should be drawn from all sectors and should include health officials, school authorities, and community leaders; and roles and responsibilities should be defined for each. Other factors to be considered are staff vacancies; transfers and new appointments; school schedules, examinations, and holidays; and local festivals. Planners also need to take into account services currently being provided by health workers to avoid overbooking facilities and health worker time. Long-term program planning also should take into account the possibility of unstable electricity and poor infrastructure, which may be particularly problematic in mountainous and remote areas. In general, microplanning tailors a vaccination program for the educational level, cultural norms, climate, and geography of each region.

LESSON 9: While the workload for health center staff and teachers will increase due to their participation in HPV vaccination activities, the extra duties are manageable because they occur only three times per year (according to the vaccine delivery schedule).

Although health workers noted the impact of HPV vaccination on their regular work, they consistently said that the extra work was acceptable and manageable. Based on observations from supervisory visits during vaccination sessions, the negative impact appeared to be minor since most vaccination sessions took only half a working day, with one session per vaccine dose required (i.e., three times per school year).

Among the concerns of health workers was a shortage of personnel on vaccination day. To address this challenge many commune health center teams mobilized available personnel from commune mass organizations or health staff from the district and provincial levels, a common practice in Vietnam. Teachers found ways to incorporate the extra work into their schedules; for example, they tried to use already-scheduled parent meetings for discussions about HPV vaccination.

Introduction of a new vaccine usually requires a significant investment in communication activities, training, and supervision during the initial project stages, placing a greater burden of work on health staff in provinces and districts. These activities can be expected to decrease when HPV vaccinations become part of routine services.

LESSON 10: Integrating HPV vaccination into an existing system may reduce costs to an affordable level.

Evaluation of the project suggested that the cost of adding HPV vaccine to the current EPI system may be affordable when activities are well integrated into routine EPI practices. In comparison with the cost per dose of other vaccines in the EPI system in Vietnam, the program costs for HPV vaccination were higher, but when start-up costs were omitted, the cost per dose was comparable to that for other vaccines. This was especially true for the urban and rural areas, as opposed to the mountainous regions. Start-up costs comprised between 50 and 60 percent of the total economic cost. Among the recurrent costs (excluding the cost of vaccine), staff costs were highest—comprising around 50 percent across all strategies and regions—followed by other implementation costs.

While there were no clear differences in costs per dose between the two vaccine delivery strategies of the HPV demonstration project, there was significant difference in the cost for delivery based on location, with remote and mountainous sites being more expensive.

It is expected that start-up costs for scaling up an HPV vaccination program will be a significant investment for any country, but probably will be limited in duration to about two years.

LESSONS LEARNED:

Training, community mobilization, and information and education

Health worker and teacher training

LESSON 11: Training methods and materials should be developed and schedules for training should be set up well in advance of the first training sessions.

Preparing carefully for training sessions is essential, as the quality of training will be low if there is not enough time to prepare, training sessions are too short, or there are too many trainees in each class. The training program should provide instruction on cervical cancer, HPV infection, and HPV vaccines, as well as on the vaccination process. In training staff to conduct community education, it is best to have the final versions of IEC materials ready prior to training so that they can become familiar with the materials well before conducting community visits.

A variety of training methods were used in Vietnam, including presentations, demonstrations, group discussions, role-plays, and games. Both trainers and trainees highly appreciated the variety of training methods used in the courses because they promoted two-way communication and interaction between trainers and participants. The activity-based participatory training helped service providers gain experience with potential field situations.

Specific training materials can be helpful for different audiences; for example, for training of physicians, scientific information can be provided about cervical screening and the HPV vaccine. Country-specific information about cervical cancer can help health workers clearly understand the threat in local communities.



HPV vaccine program in Can Tho City school.

Health workers considered participatory training sessions highly effective

When asked about preferred teaching methods, both trainers and trainees mentioned group discussion, role-play, and practicum as effective learning methods. Comments from trainees included the following:

“These methods facilitated two-way communication. Both trainers and trainees worked together. It was easier to memorize things... After a short presentation, participants received the handouts and then did group work or practice. It is a good sequence. Thus, it is relevant to me and easier for me to conduct the communication later on in the community.”

–Trainee in Nong Cong, Thanh Hoa

“We had chance to practice different skills, even minor ones like how to get vaccine into the syringe. In previous training courses, only the trainer gave demonstrations. We did not have the chance to practice like in these courses.”

–Trainee in Long Hoa commune, Quan Hoa, Thanh Hoa

“I mostly preferred the role play and group discussion because these two methods helped to practically understand the work; for example, the role play on household visits helped me learn more about what one would need to do in a household visit and how to talk with the local people.”

–Trainee in Nam Xuan commune, Quan Hoa, Thanh Hoa

LESSON 12: Separate training sessions for teachers and health workers allow for a focus on their specific roles.

PATH, NCHEC, and NEPI staff developed four training curricula, tailoring them for each target group: trainers, health workers, teachers, and IEC workers. Participants found it useful when instructions on conducting IEC activities for different community populations were included along with the training materials.

In general, training programs will be more efficient and effective if content, format, and materials are tailored to specific trainee groups. For example, health workers need detailed technical training, while teachers would benefit from guidance on how to communicate and to manage an immunization session if it will be held at school. In addition to specialized training for their particular level and expertise, all groups need training on how to communicate with the community about cervical cancer prevention.

Trainings were organized by NCHEC following a cascade design, in which national trainers conducted training-of-trainers’ sessions for provincial and district staff, who then conducted trainings for commune health workers and teachers. National EPI staff were present during the trainings conducted by national and provincial trainers to provide monitoring and supportive supervision to the trainers.

Parents actively sought information on HPV vaccination

Many parents were active decision-makers—they sought out information beyond that offered by the *HPV Vaccines* project to inform and confirm their vaccination decisions.

A quantitative survey showed that more than four out of five parents of fully vaccinated girls had discussed HPV vaccination with someone in the community prior to their decision in the first year. As the vaccination campaign matured in the second year and coverage rates rose, there was more communication and discussion about the program. Moreover, active decision-makers were significantly more likely to accept vaccination than passive decision-makers who made a decision without discussion.³

Examples of statements from parents who were active decision-makers:

“After the doctor said that the vaccine has been circulated in the market for everyone and has passed the trial period, I felt more secure. Plus, my relatives said the vaccine has been used in America so that’s why I agreed to vaccinate my daughter.”

–Parent of fully-vaccinated girl, Year 1, urban area

“I searched in newspapers and found that although this vaccine was new in Vietnam, it had been growing in many countries. So when I received the information, I talked to my wife and came to a final decision. In Southeast Asia, cervical cancer is quite common, so when there is a scientific advance in treatment, we, the parents, should create good conditions for our child. We both decided that.”

–Parent of fully-vaccinated girl, Year 1, urban area

Community outreach

LESSON 13: Tailoring methods and messages for specific audiences, and planning well in advance, are essential to successful community sensitization and mobilization.

For the Vietnam project, communication experts developed a number of IEC materials including leaflets, posters, panels, and radio spots for communities, and a handbook for village health workers and teachers. Materials were reviewed and pretested before finalization. (Instructions for materials development and pretesting can be found online.²¹) Using mass media was more effective in urban settings, while direct and interactive methods worked better in rural and mountainous areas. Many urban, educated families reached out to friends, family, and opinion leaders for guidance prior to making their decision. Thus, it was important to have information available early so everyone had time to become informed, seek the opinions of others, and come to decisions.

During new vaccine introduction, it is important to develop a communication strategy and to then create messages and use channels for specific situations, including various audiences and geographic regions. Creation of a comprehensive package of informational materials in various formats designed for different audiences will help ensure informed choice among families and will help health workers, teachers, and others to respond accurately and confidently to questions. Incorporating a crisis communication plan into the overall strategy to address possible unfavorable responses to an HPV vaccination program is a good first step in preparing for timely responses and management if a difficult situation should arise.



Community leaders discuss communication materials.

LESSON 14: High-visibility involvement of government agencies demonstrates that a vaccination program has official support and increases community participation.

The demonstration vaccination program in Vietnam was planned and implemented by NIHE and NCHEC in partnership with PATH, and this government involvement created trust and fostered participation by families. NIHE has a reputation for high standards and rigor, which contributes to a positive attitude in the population toward vaccination in general. Involving influential government stakeholders in a visible fashion encouraged people to participate, and parents felt reassured when they saw that HPV vaccine, like other vaccines, was being delivered by ministry of health staff and that informational materials carried ministry of health logos.

In many countries, the EPI is held in high regard for successfully delivering life-saving vaccines, and people trust government programs. HPV immunization programs will benefit from the positive experience communities have with their EPI.

LESSON 15: Participation of community leaders is essential to acceptance of the program.

In Vietnam, groups that became involved in community education and mobilization included political officials, school headmasters, members of the Women's and Youth Unions, heads of villages, and members of parents' associations. Cultural and information groups and district and commune officials participated by broadcasting radio messages and placing posters and banners in the community. Health workers and teachers also were valuable and credible spokespersons for cervical cancer prevention because parents had positive attitudes toward both of these groups.

The opinions of local leaders can affect vaccine acceptance in the community, so it is important to invite participation of these stakeholders early and to brief them thoroughly in advance of vaccine introduction. Influential figures, teachers, health workers, and other members of the public can have a large impact on vaccination programs, even if they are not directly participating, through informal consultations with families.

Messaging

LESSON 16: Describing HPV vaccine as a “cervical cancer vaccine” facilitates understanding by the public, focuses interest on preventing disease, and provides a building block for messages.

Referring to the vaccine as a “cervical cancer vaccine” when communicating with non-professionals and less-educated community members, and as an “HPV vaccine” when communicating with health staff, worked well. Initially, some parents were uncertain about the reason for vaccinating 11-year-old girls, since they considered their daughters too young to have sex and get HPV infections. However, the majority of them understood that cancer is a deadly disease and that this was an opportunity to protect their children, and they were open to a cervical cancer vaccine. The message also was a successful one with girls: in discussion groups after vaccinations, girls in all project regions knew that vaccination helps to prevent cervical cancer.

Understanding detailed biological information about HPV infections and how they can lead to cervical cancer may be difficult for some audiences, especially those without formal education. However, families everywhere have some experience with cancer and are more likely to understand a simpler message about a vaccine that can help to prevent a type of cancer.



School girls with pamphlets about HPV vaccination.

LESSON 17: Messages should be based on an understanding of the information needs of different audiences, such as parents, girls, community groups, and community leaders.

Parents, girls, and communities will need different kinds of messages, and these groups in urban areas may need different messages from the same groups in rural areas. Members of medical societies, local health experts, and practicing physicians can be given detailed information on HPV infection, the epidemiology of cervical cancer, current practice in screening and treatment for cervical cancer, and HPV vaccination.

Parents were particularly interested in vaccine safety and effectiveness and were concerned that the HPV vaccine was new and—they thought—possibly experimental; thus, it was important to assure them that the vaccine was already licensed and approved by the government. Parents whose daughters were vaccinated consistently cited “health promotion” and “disease prevention” as the primary reasons for having their daughters immunized.

As suggested in Lesson 4, doing formative research before beginning IEC campaigns in order to learn which messages will find rapport with different audiences will make communication more effective.

LESSON 18: Refusal to accept HPV vaccination often is due to misinformation.

In Vietnam, even though vaccine coverage was high, there were some parents who did not want their daughter vaccinated, especially during the first year of the project. In one urban area, coverage was lower than in other areas in the first year due to community concerns. However, in the second year, revised educational materials and communication messages that directly addressed the concerns from the first year were disseminated to parents and girls, and coverage increased to the high levels observed in the other areas.

Parental reasons for non-acceptance of the vaccine included concern about side effects, safety, effectiveness, potential effect on girls’ health and fertility, and the fact that the vaccine was new.² In addition, some families heard about adverse events reported in connection with other vaccinations, such as rabies or hepatitis B, and became worried about all vaccinations. In other instances, misinformation in newspapers or on television led them to refuse the HPV vaccine.

Misconceptions can be overcome and vaccine acceptance can be improved when outreach addressing specific questions and concerns is provided in a timely manner.

Conclusion

The purpose of the *HPV Vaccines: Evidence for Impact* project was to provide policymakers and program managers in low- and middle-income countries with the data they need to make decisions about introducing HPV vaccine in their national immunization programs. Experience in Vietnam demonstrates that high coverage for the vaccine can be achieved through either a school- or health center-based vaccine delivery strategy. Health, health promotion, and education sectors can collaborate effectively regardless of delivery strategy, and this, coupled with participation from other community-based organizations, can lead to program success. Health workers and teachers can be trained and systems strengthened to successfully implement HPV vaccinations without significantly disrupting other work and priorities at the provincial, district, and commune levels. High program acceptability within communities can be achieved through formative research followed by targeted messaging and effective communication strategies using multiple information channels.

Cervical cancer continues to be a leading cause of death for women throughout the world. Information from HPV immunization experiences in Vietnam and the other PATH project countries can enable policymakers in other regions to engage in similar evidence-based planning and outreach, and to implement their own successful programs.

Cervical cancer prevention resources

RHO Cervical Cancer Library
www.rho.org

Cervical Cancer Prevention Action Planner
www.rho.org/actionplanner

World Health Organization (WHO) cervical cancer publications
www.who.int/reproductivehealth/topics/cancers

WHO position paper on HPV vaccines
www.who.int/wer/2009/wer8415.pdf

Progress in Cervical Cancer Prevention: The CCA Report Card
www.cervicalcanceraction.org/pubs/pubs.php

Alliance for Cervical Cancer Prevention
www.alliance-cxca.org

Cervical Cancer Action coalition
www.cervicalcanceraction.org

WHO/Institut Català d'Oncologia Information Centre on Human Papilloma Virus (HPV) and Cervical Cancer
www.who.int/hpvcentre

Cervical Cancer: The Real Lady Killer
Film from BBC World's "Kill or Cure?" series
www.rho.org/multimedia.htm

REFERENCES

1. Wittet S. Cervical cancer vaccine project [fact sheet]. Seattle: PATH; 2010.
2. LaMontagne DS, Barge S, Le NT, et al. Human papillomavirus vaccine delivery strategies that achieved high coverage in low- and middle-income countries. *Bulletin of the World Health Organization*. 2011;89(11):821-830B. Available at: www.who.int/bulletin/volumes/89/11/11-089862/en/index.html.
3. Cover J, Nghi NQ, LaMontagne DS, Huyen DTT, Hien NT, Nga LT. Acceptance patterns and decision-making for human papillomavirus vaccination among parents in Vietnam: an in-depth qualitative study post-vaccination. *BMC Public Health*. 2012; 2012 Aug 9;12:629.
4. Paul P, LaMontagne DS, Nga LT. Knowledge of cervical cancer and HPV vaccine post-vaccination among mothers and daughters in Vietnam. *Asian Pacific Journal of Cancer Prevention*. 2012; 2012;13(6):2587-92.
5. Levin CE, Minh HV, Odaga J, et al. Incremental costs of strategies to deliver human papillomavirus vaccine to young adolescent girls in Peru, Uganda and Viet Nam. *Bulletin of the World Health Organization*. Revision submitted.
6. Ferlay J, Shin HR, Bray F, Forman D, Mathers C, Parkin DM. GLOBOCAN 2008 v1.2, Cancer Incidence and Mortality Worldwide: IARC CancerBase No. 10 [Internet]. Lyon, France: International Agency for Research on Cancer; 2010. Available at: globocan.iarc.fr.
7. Smith JS, Lindsay L, Hoots B, et al. Human papillomavirus type distribution in invasive cervical cancer and high-grade cervical lesions: A meta-analysis update. *International Journal of Cancer*. 2007;121(3):621-632.
8. Ault KA, FUTURE II Study Group. Effect of prophylactic human papillomavirus L1 virus-like-particle vaccine on risk of cervical intraepithelial neoplasia grade 2, grade 3, and adenocarcinoma in situ: a combined analysis of four randomised clinical trials. *The Lancet*. 2007;369(9576):1861-1868.
9. Paavonen J, Naud P, Salmeron J, et al. Efficacy of human papillomavirus (HPV)-16/18 AS04-adjuvanted vaccine against cervical infection and precancer caused by oncogenic HPV types (PATRICIA): final analysis of a double-blind, randomised study in young women. *The Lancet*. 2009;374(9686):301-314.

10. Schiller JT, Castellsague X, Villa LL, Hildesheim A. An update of prophylactic human papillomavirus L1 virus-like particle vaccine clinical trial results. *Vaccine*. 2008;26:K53-K61.
11. World Health Organization. Human papillomavirus vaccines: WHO position paper. *Weekly Epidemiological Record*. 2009;84(15):118-131. Available at: www.who.int/wer/2009/wer8415.pdf.
12. Nghi NQ, LaMontagne DS, Bingham A, et al. Human papillomavirus vaccine introduction in Vietnam: formative research findings. *Sexual Health*. 2010;7(3):262-270.
13. PATH. *Shaping Strategies to Introduce HPV Vaccines: Formative Research Results from India, Peru, Uganda, and Vietnam*. Seattle, WA: PATH; 2009. Available at: www.rho.org/formative-res-reports.htm.
14. Giuliano AR, Salmon D. The case for a gender-neutral (universal) human papillomavirus vaccination policy in the United States: Point. *Cancer Epidemiology, Biomarkers & Prevention*. 2008;17(4):805-808.
15. Zimet GD, Liddon N, Rosenthal SL, Lazcano-Ponce E, Allen B. Chapter 24: Psychosocial aspects of vaccine acceptability. *Vaccine*. 2006;24(Suppl. 3):S201-S209.
16. Kahn JA, Burk RD. Papillomavirus vaccines in perspective. *The Lancet*. 2007;369(9580):2135-2137.
17. Mays RM, Sturm LM, Zimet GD. Parental perspectives on vaccinating children against sexually transmitted infections. *Social Science & Medicine*. 2004;58(7):1405-1413.
18. Bednarczyk RA, Davis R, Ault K, et al. Sexual Activity-Related Outcomes After Human Papillomavirus Vaccination of 11- to 12-Year-Olds. *Pediatrics*. 2012; 130(5):798-805.
19. Bingham A, Janmohamed A, Bartolini R, et al. An approach to formative research in HPV vaccine introduction planning in low-resource settings. *The Open Vaccine Journal*. 2009;2:1-16.
20. PATH. *Conducting Formative Research for HPV Vaccination Program Planning*. Seattle, WA: PATH; 2012. Cervical Cancer Prevention: Practical Experience from PATH. Available at: www.rho.org/HPV-formative-research.htm.
21. PATH. *Immunization and Child Health Materials Development Guide*. Seattle, WA: PATH; 2001. Available at: www.path.org/vaccineresources/files/CVP-Materials-Development-Guide.pdf.

