

HPV Vaccines: Evidence for Impact

Small Grants Program
Final Report

March 11, 2013

MAILING ADDRESS

PO Box 900922
Seattle, WA 98109
USA

ADDRESS

2201 Westlake Avenue
Suite 200
Seattle, WA, USA

TEL: 206.285.3500

FAX: 206.285.6619

www.path.org



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Abbreviations

EPI	Expanded Programme on Immunization
FGD	focus group discussion
HPV	human papillomavirus
IDI	in-depth interview
IEC	information, education, and communication
MOH	Ministry of Health
NGO	nongovernmental organization
PATH	Program for Appropriate Technology in Health
PIH	Partners In Health
UMATI	Uzazi Na Malezi Bora Tanzania
VIA	visual inspection with acetic acid

Executive summary

The *HPV Vaccines: Evidence for Impact* project was initiated by PATH in 2006 to generate evidence from middle- and low-resource countries about public-sector introduction of human papillomavirus (HPV) vaccines. The major focus of the project was in four countries—India, Peru, Uganda, and Vietnam—where extensive formative research and vaccination demonstration projects were carried out. Another component of the project was a small grants program, whose purpose was to support efforts by agencies in other countries to gather evidence that would improve access to cervical cancer prevention activities in their regions. Seven of the nine small grants that were awarded went to research projects, while two were given to enhance local capacity for providing secondary prevention activities.

The socio-cultural research studies from the small grants program affirmed many findings from the four major project countries, such as the low level of knowledge about cervical cancer and HPV vaccines in these settings and the need to provide appropriate educational messages to ensure acceptance of vaccination programs and high coverage of the target population. Studies that investigated health system readiness found, as did those in the four major countries, that existing national immunization programs were best equipped to deliver HPV vaccinations, with some stakeholders preferring vaccinations at health centers and others favoring schools.

In the two countries where grants were awarded to strengthen secondary prevention, local health providers were trained in visual inspection with acetic acid (VIA) and cryotherapy, and cervical cancer screening was started in a number of local clinics. The final grant was provided for research into the cost of scaling up comprehensive cervical cancer prevention (screening and treatment for older women as well as vaccination for young adolescents), a field not investigated in the major project countries.

In addition to adding to the evidence base for planning HPV vaccination in low- and middle-income countries and for improving comprehensive cervical cancer prevention, the findings from the small grants projects suggested a number of benefits related to the value of the small grants program itself, as part of the overall *HPV Vaccines: Evidence for Impact* project:

1. Small grants for formative research allowed local researchers and planners to develop or enhance their expertise and “claim the space” of cervical cancer prevention within their countries, enabling them to have greater influence on national decisions and plans.
2. Small formative research or pilot projects moved cervical cancer prevention agendas forward, acting as building blocks for further activities.
3. Studies funded by the small grants that published results in peer-reviewed journals or presented findings at national and regional conferences raised the visibility of cervical cancer prevention and informed the broader community.

Introduction

In June 2006, PATH initiated the *HPV Vaccines: Evidence for Impact* project to generate information for decision-making about public-sector introduction of human papillomavirus (HPV) vaccines in middle- and low-resource countries. The major focus of the project was a collaboration with partners in four countries—India, Peru, Uganda, and Vietnam—to conduct formative research and use this research to implement vaccination demonstration projects. Results from the formative research and from the demonstration projects have been published in the peer-reviewed literature and in a number of “lessons learned” documents (available at the [RHO cervical cancer library](#) and the [PATH website](#)).

A critical mechanism for supporting the decision-making processes of additional countries and broadening the impact of the project was a targeted small grants program. Grants were available to governments, universities, and nongovernmental organizations (NGOs) in Africa, Asia, and Latin America that had experience working in cervical cancer prevention, vaccination, and adolescent or reproductive health for work in the following areas:

1. Conducting formative research related to:
 - Community knowledge, attitudes, or behavior related to cervical cancer prevention/HPV vaccine.
 - The capacity of service delivery or community-based systems to deliver HPV vaccine, including mechanisms for reaching adolescents with vaccine.
2. Strengthening secondary prevention.
3. Documenting the cost of comprehensive cervical cancer prevention.

A multidisciplinary team evaluated proposals according to their relevance to cervical cancer program and policy planning, rigor of the planned approach, organizational capacity to carry out the proposed work, past history conducting similar work, adequacy of the monitoring and evaluation plan, the organizational track record related to fiscal responsibility, and the expertise of the principal investigator.

This small grants program expanded the evidence base generated by the four major *HPV Vaccines* project countries, providing rich research information and enhancing capacity in an additional nine countries. The findings complement results from the four major countries and are summarized in this report.

Overview of the small grants projects

The primary purpose of the small grants program was to support efforts by agencies in countries other than the four main project countries (India, Peru, Uganda, and Vietnam) to gather evidence that would improve access to cervical cancer prevention activities. Eight grants were awarded to countries outside of the main HPV vaccine project and one grant was made to a group in a part of India not covered by the main Indian project activities (the research was conducted in a different Indian state). Seven of the nine small grants projects focused on original research, while the two dealing with strengthening of cervical cancer screening and treatment were designed to enhance local capacity.

Formative research studies

The first category of activities funded by the small grants program involved formative research—conducted to help formulate a policy, strategy, or message. They comprised the majority of the small grants issued. Since most of the small grants were initiated early in the project, before much information had been gathered and published about these topics, this was the logical focus of many of the requests received. The following small grants fall under that rubric:

- **Argentina: Knowledge and attitudes regarding HPV vaccination in Argentina.** Centro de Estudios de Estado y Sociedad and Consejo Nacional de Investigaciones Científicas y Técnicas
Project period: August 1, 2008 to June 20, 2010
- **Colombia: Knowledge and acceptability of the HPV vaccine among parents of adolescents, decision-makers and doctors in Colombia.** Instituto Nacional de Cancerología
Project period: October 1, 2007 to March 31, 2009
- **India: Assessment of acceptability of HPV vaccine among parents of adolescent girls and physicians' attitudes toward HPV immunization.** Public Health Research Institute and C.S.I. Holdsworth Memorial Hospital
Project period: October 1, 2007 to December 31, 2008
- **Nepal: Challenges of HPV vaccine introduction and management in Nepal.** Center for Research on Environment, Health, and Population Activities and Nepal Network for Cancer Treatment and Research
Project period: April 15, 2010 to April 14, 2011
- **Ethiopia: Challenges and opportunities in introducing HPV vaccine with other adolescent health interventions: health care system and socio-cultural perspective.** Jimma University and Federal Ministry of Health of Ethiopia
Project period: September 1, 2010 to April 30, 2011
- **Malawi: An assessment of the health system in readiness for HPV vaccine introduction among adolescent girls in Malawi.** University of Malawi
Project period: January 1, 2012 to August 31, 2012

Projects to strengthen secondary prevention

The *HPV Vaccines* project in the four major countries included a component to strengthen secondary prevention. This component was also addressed in two small grants:

- **Rwanda: Introduction of cervical cancer screening and treatment into Rwandan district health system.** Partners In Health/Inshuti Mu Buzima
Project period: August 1, 2010 to April 30, 2011
- **Tanzania: Making cervical cancer screening available in clinics throughout the country: assessment of needs and logistics of service.** UMATI (Uzazi Na Malezi Bora Tanzania, affiliate of the International Planned Parenthood Federation)
Project period: May 1, 2010 to April 30, 2011

Cost study

Cost considerations are an important part of vaccine implementation programs as well as comprehensive cervical cancer programs. The *HPV Vaccines* project in the four major countries included cost studies,¹ and one cost study was funded under the small grants program:

- **South Africa: The cost of scaling up the integrated cervical cancer prevention program in South Africa.** University of Cape Town
Project period: July 1, 2009 to June 20, 2010

Findings from the small grants projects

This section summarizes the most important findings from the nine small grants studies. Readers interested in obtaining individual project reports should contact PATH at info@path.org.

Formative research studies

Formative research in the four major project countries—India, Peru, Uganda, and Vietnam—included three topic areas: the socio-cultural environment, health systems structures, and policy pathways. The findings provide a foundation for a communications strategy (for outreach to communities), a vaccine delivery strategy, and an advocacy strategy (for outreach to policymakers).² The research identified common themes across the countries.^{2,6} PATH researchers were surprised at the consistency of findings across such diverse settings.

Most of the research in the six small grants countries focused on the socio-cultural environment, gathering information on target audience beliefs, values, attitudes, knowledge, and behaviors. Some studies also investigated health systems, to provide information on the best way to deliver vaccine to adolescent girls.

By and large, the small grants study results echoed findings in the four major project countries. This section of the report summarizes the objectives and results of small grants formative research projects and draws some comparisons with findings from the four major countries, which have been reported in two peer-reviewed, scientific publications^{6,9} as well as in [lessons learned](#) and [practical experience](#) documents.

The small grants studies involving formative research used questionnaires, focus group discussions, and in-depth interviews as their major tools. Sampling generally was purposive, designed to ensure general rather than statistical representativeness. Table 1 shows the number of participants and methods used in the various studies.

Study country	Number of participants and type of data
Argentina	Women aged 18–49 years in Buenos Aires: 1,200 structured questionnaires Gynecologists: 676 IDIs Pediatricians: 94 IDIs
Colombia	Parents of adolescents: 182 FGDs Physicians: 46 FGDs Health care decision-makers: 14 IDIs
India	Parents, extended family members of adolescent girls, community health workers: 10 FGDs Physicians serving adolescent girls: 20 IDIs
Nepal	Parents of adolescent girls: 18 FGDs Adolescent girls: 18 FGDs Community leaders: 18 FGDs National and district-level stakeholders: 100 IDIs
Ethiopia	Adolescents, parents, community leaders: 30 FGDs Policymakers, health workers, program coordinators: 46 IDIs
Malawi	Key informant interviews Girls aged 9- 14, men, women: 49 FGDs Users of immunization services: 404 exit interviews

FGD: focus group discussion; **IDI:** in-depth interview.

Socio-cultural formative research

Argentina: Knowledge and attitudes regarding HPV vaccination in Argentina⁷

Argentinean investigators carried out formative research among women in the Buenos Aires metropolitan area to assess their knowledge of HPV vaccines and to explore determinants of HPV vaccine uptake and acceptability after an extensive, controversial HPV vaccine advertising campaign. HPV vaccination was approved for sale in Argentina in 2006 but was not included in the national immunization program. In 2008, a mass media campaign carried out by a cancer NGO was halted due to criticisms, especially for the lack of clarity about the fact that individuals would need to pay for the vaccine.

Researchers analyzed HPV vaccine uptake/acceptability for women and their daughters aged 9–15, and assessed willingness of mothers with daughters younger than 9 years to have them vaccinated in the future. The researchers also carried out surveys among gynecologists and pediatricians to document their knowledge about the role of HPV vaccine in cervical cancer prevention and their willingness to recommend HPV vaccination.

Only 25 percent (about 300) of the women interviewed remembered the advertising campaign, and 75 percent (226) of these said they would be willing to receive the vaccine. In this sample, the advertising campaign did not appear to have had a negative effect on women’s willingness to receive vaccine or to have their daughters vaccinated. The main reasons given by women for not having their

daughters vaccinated were: “Doctor does not recommend it;” “My daughter is not sexually active;” “I did not think that the vaccine was for my daughter;” and “The vaccine is too expensive.” Among women who had at least one daughter younger than 9 years and knew about HPV (a total of 100 women), 36 percent had heard about HPV vaccination. Seventy-four percent of these answered that they would have their daughters vaccinated if they were preadolescents. Again, this was a small, but carefully defined, sample. The reason most commonly given was, “I want my daughter to be protected against cervical cancer.”

The study found that acceptability of HPV vaccine was high among gynecologists and pediatricians. But both groups of physicians considered the high cost of the vaccine to be the major barrier to widespread vaccination, while concern about vaccine safety, voiced by around 20 percent of each group, was the second most important barrier. While 82 percent of gynecologists and 75 percent of pediatricians interviewed reported that they had prescribed the vaccine, they did so for only about 10 percent of their patients.

A number of findings in the Argentina study were similar to findings in the four major project countries. For example, in the four countries, understanding of cervical cancer and HPV was limited,⁶ and this was reflected in the Argentina study, where only 35 percent of women surveyed knew about HPV infections. The Argentina results differed from findings in the four major project countries in regard to endorsement of the vaccine: in the four countries, respondents mentioned the importance of government endorsement of the vaccine, while in Argentina, recommendation by physicians was emphasized by the women interviewed. In both the four-country findings reports and the Argentina study, the desire to prevent cervical cancer was consistently mentioned as an important reason for receiving the vaccine.

Colombia: Knowledge and acceptability of the HPV vaccine among parents of adolescents, decision-makers and doctors in Colombia⁵

The purpose of the study in Colombia was to explore socio-cultural determinants of vaccination against HPV, particularly knowledge, attitudes, and acceptability among parents of adolescents, physicians (general practitioners, gynecologists, and pediatricians), and local health decision-makers in four regions of the country.

As was found in nearly all countries investigated for the *HPV Vaccines* project, knowledge levels for HPV and HPV vaccines among parents in Colombia were low. Participants in large cities were more likely to be familiar with the vaccine than those in rural areas, and some were skeptical about its use, noting that the vaccine had not been added to the national immunization plan. They interpreted this as possible government disapproval.

While the *HPV Vaccines* project findings from India, Peru, Uganda, and Vietnam did not indicate that the issue of the vaccine promoting sexual promiscuity was an important consideration for most parents,⁶ in one of the four regions in Colombia where focus groups were conducted, parents commented that HPV vaccination could promote promiscuity, as it could give children a false sensation of protection, fostering risky behaviors. This concern was not noted in the other three regions.

Surveys of physicians showed that the level of knowledge of HPV and HPV vaccines was highest among pediatricians, moderately high among gynecologists, and low among general practitioners. The specialists interviewed knew about the vaccine through visits or events organized by the vaccine manufacturers. Overall, physicians familiar with the vaccine expressed a high acceptance, as was found in the Argentina study. Physicians mentioned a number of barriers to vaccination, including vaccine price and the fact that parents do not believe their adolescent children are at risk.

Decision-makers at the local level generally were not well informed about HPV or HPV vaccines. The study investigators concluded that parents, community leaders, and physicians should have better information about HPV and HPV vaccines and that there was an urgent need for national decisions and guidelines on HPV vaccination.

India: Assessment of acceptability of HPV vaccine among parents of adolescent girls and physicians' attitudes toward HPV immunization⁸

As in Argentina and Colombia, formative researchers in Mysore, in the southwestern Indian state of Karnataka, investigated attitudes toward HPV vaccination among parents and physicians. Results from parents were stratified by sex, religion, and urban versus rural residence. Acceptability of HPV vaccination was high in all groups of parents, and this appeared to be related more to positive feelings about government vaccine programs than to knowledge about HPV or cervical cancer. The investigators stated that the main facilitators of the acceptability of HPV vaccination were endorsement of the vaccine by the government and the desire to avoid cancer, a finding that echoed results in the four major project countries, where vaccination and government-sponsored immunization programs were generally supported by respondents.⁶

While many parents believed that some girls were at risk for HPV infection, few felt their own daughters would be sexually active before marriage. Decision-making on vaccines appeared to be centered in the family, as was the case in the four major project countries.⁶ Fathers felt both parents were equal decision-makers, while mothers stated that the mother-in-law was the primary decision-maker.

Although most of the 20 physicians interviewed expressed positive attitudes toward vaccination in general, and HPV vaccination in particular, a majority also believed that few of their patients would react positively to an HPV vaccine recommendation. Eighty percent gave the high cost of the vaccine as the reason for this, while 40 percent noted that parents would not consider a vaccine against a sexually transmitted disease because they would not believe their daughters were sexually active and could be exposed to HPV infection. Because of these comments, researchers predicted that many physicians would not recommend the vaccine.

The authors of the study in Karnataka concluded that messages used during introduction of HPV vaccine should build on positive feelings for current government vaccine programs and that HPV vaccination would be more successful targeting girls after puberty in India.

Nepal: Challenges of HPV vaccine introduction and management in Nepal³

The overall objectives of the study in Nepal were to explore stakeholders' and community members' knowledge, attitudes, perceptions, and acceptability around cervical cancer prevention programs, and to identify challenges and barriers to HPV vaccine introduction. The investigators intended that the findings of the study would help establish an evidence base for Nepal and enable the government to design strategic policies and programs, including information, education, and communication (IEC) and advocacy strategies for the promotion of HPV vaccination.

Although awareness about cervical cancer was high among all three categories of community-based informants—community leaders, parents, and adolescent girls—awareness about the HPV vaccine was low across all districts except for one where HPV vaccination already had been implemented. Despite the low knowledge, response to the idea of a vaccination program was very positive.

National and district stakeholders mentioned several challenges regarding HPV vaccination: illiteracy and ignorance among women, low level of awareness of cervical cancer risk, women's health taking a lower priority in the family and community, political instability, and geographical challenges for vaccine delivery.

Questions were voiced among community leaders regarding the risk of infertility in women from the vaccine, because of rumors about other vaccines in the past. This echoed similar, unfounded concerns in the four-country reports.⁶

Community-level participants in the study noted the importance of implementing an HPV vaccination program through the government health system because of the faith that the community has in government immunization programs. The researchers recommended that once the national policy on vaccination is determined, interdepartmental workshops should be conducted with the health and education sectors, and subsequently, awareness-raising programs could be incorporated into the school curriculum.

Ethiopia: Challenges and opportunities in introducing HPV vaccine with other adolescent health interventions: health care system and socio-cultural perspective⁴

Like the formative research conducted in the four main project countries, the study in Ethiopia focused both on socio-cultural and systems issues. The aim of the socio-cultural aspect was to determine the acceptability of HPV vaccine to adolescents, parents, and health workers. The majority of participants did not know cervical cancer by name; however, they recognized the illness by its symptoms and noted that it is common in their communities. None of the participants mentioned a microbial cause of the disease and none was aware of a vaccine to prevent cervical cancer, although nearly half of study participants believed that cervical cancer is a communicable disease and sexual intercourse is the main route of transmission.

The community had a positive attitude toward vaccination in general, as noted for virtually all other countries involved in the *HPV Vaccines* project. In the Ethiopian study, mothers generally were found to

be the decision-makers for adolescents. Parents and community leaders indicated willingness to have their daughters vaccinated, and adolescents were willing to be vaccinated for HPV, but they requested detailed information about the disease, including HPV transmission, prevention strategies, and HPV vaccine and its side effects, before they would agree to be vaccinated. The study in Ethiopia found that some people associated the vaccination of girls with infertility, as was the case in other countries.

Severe stigma is associated with cervical cancer in Ethiopia, and this has contributed to delayed health-seeking behavior and a poor quality of life for affected women. Educational messages for communities will need to address all related topics.

The researchers recommended that an HPV vaccination demonstration project be initiated to gather further evidence for the national introduction of the vaccine in Ethiopia and stated that their study provides a basis for the design of such a project within the existing government immunization program.

Health systems formative research

The currently ongoing small grants project in Malawi is focusing specifically on health system readiness, while the studies in Nepal and Ethiopia gathered information both on health systems and the socio-cultural environment. Research into health systems relevant to HPV vaccine introduction explored such issues as health services for young adolescents, vaccine logistics and the cold chain, and possible HPV vaccine delivery strategies.

Malawi: An assessment of the health system in readiness for HPV vaccine introduction among adolescent girls in Malawi¹³

The overall objective of this study was to identify factors that would hinder or facilitate the effective delivery of the HPV vaccine in the public sector in Malawi. The researchers conducted focus group discussions, exit interviews at immunization sites, and interviews with key informants such as district health officers and primary education advisers.

Participants in focus group discussions and in interviews indicated that schools would be an appropriate venue for delivering the HPV vaccine, since that is where the majority of the target population will be found. The report noted that some vaccinations and other health outreach activities currently are delivered at schools.

Obstacles to HPV vaccine introduction include the fact that it will only target girls aged 9-14; hence, this may fuel the speculation that the vaccine is given to girls for contraception. Interviewees stated that this can be addressed by adequately informing the community before the vaccine is introduced. Some key informants suggested that village chiefs should be briefed first, and that they should inform other members of the community.

Health workers who were asked about the challenges that they experience in the delivery of immunization services mentioned mobility: they noted that they did not have transport and the distances they covered were large. In a number of districts health workers reported that there was a

general shortage of syringes and vaccines and that the cold chain was not adequate. In terms of staffing, a number of health workers reported that the introduction of the vaccine will increase their workload and hence strain the already understaffed health facilities.

Based on their work, the researchers recommended that intensive awareness campaigns be conducted at community level, especially concerning the fear about effects on the reproductive health of girls. Since most of the girls aged 9-14 are in school, the vaccine should be delivered through schools. Vaccinators should be encouraged to work with community leaders to track unimmunized children. Further, because of some inadequacies in the cold chain, the Government of Malawi should ensure that there are adequate storage facilities for the new vaccine and that there will not be stock-outs.

Nepal: Challenges of HPV vaccine introduction and management in Nepal³

Health systems research for the four major project countries⁹ found that Expanded Program on Immunization (EPI) systems already in place were the best method for incorporating HPV vaccinations into national programs. At the same time, it was considered essential to inventory the health system infrastructure and strengthen it where necessary before adding HPV vaccinations.

Investigators found problems with Nepal's national immunization program, such as inadequate cold chain storage space, poor repair and maintenance of cold systems, and weak immunization management, supervision, monitoring, and reporting. They also reported an inadequate number of vaccinators.

Some suggestions for improvement in the four-country reports included increasing refrigerator capacity at local levels (especially if vaccine were supplied as single-dose vials and if other new vaccines would soon be introduced as well), replacing nonfunctioning equipment, ensuring adequate supply of fuel, and providing additional training to health workers.

In Nepal, community leaders listed facilities such as health posts or sub-posts as preferred venues for vaccinations. Parents from all ethnic groups also suggested using health posts, as did the majority of adolescent girls who participated in focus group discussions. The main reason cited was that the vaccine would be given by a skilled health provider who could answer questions and treat any side effects. Girls who were attending schools, however, felt that school-based vaccination (with vaccines being given by visiting government health workers) would be best, since teachers could remind them to take all three doses, and their parents would trust vaccinations arranged by school authorities. Community leaders and parents also listed schools as possible venues, but not as their first choice.

Ethiopia: Challenges and opportunities in introducing HPV vaccine with other adolescent health interventions: health care system and socio-cultural perspective⁴

In addition to the socio-cultural components of the Ethiopia study (summarized above), this study investigated appropriate delivery strategies for the HPV vaccine and how other adolescent health interventions might be combined with an HPV vaccination program.

According to study investigators, adolescents are the most neglected segment of the community in terms of health service programs. They reportedly visit a health facility only when they are very ill. Most health interventions, such as nutrition, vaccination, and deworming, typically are provided for children younger than around 9 years of age, the youngest age approved for HPV vaccination. National-level policymakers strongly supported the idea of integrating HPV vaccination into the recently developed School Health and Nutrition Program.

In regard to venues for HPV vaccination, the Federal Ministry of Health of Ethiopia reported that more than 80 percent of young adolescents attend schools, although in a few regions, the enrollment rate is as low as 30 percent. Thus, vaccinating at schools is a viable plan; however, reaching girls who do not attend school would be a particular challenge. Health centers were noted as options for reaching this population.

Ethiopia has ample experience in running a routine EPI program, although there are some challenges, including maintaining the cold chain at the health post level, a shortage of kerosene, transportation problems leading to supply breakdown, and mobility of the target population. This information will be important to program planners working toward implementation of HPV vaccinations.

Projects to strengthen secondary prevention

An important component of the *HPV Vaccines* project in the four main countries was to assess and strengthen secondary prevention services (screening and treatment) to prevent cervical cancer in adult women. These efforts included in-country capacity-building and provision of technical assistance, especially for screening and treatment using simpler, low-cost methods, such as VIA and cryotherapy. Small grants were made in two countries for secondary prevention programs, Rwanda and Tanzania.

Rwanda: Introduction of cervical cancer screening and treatment into Rwandan district health system¹⁰

A grant to the international NGO Partners In Health (PIH) provided funds for a project in partnership with the Government of Rwanda to establish a model for the screening and treatment of cervical cancer in one health district. The objective was to demonstrate the feasibility, effectiveness, and acceptability of offering cervical cancer screening and treatment through the district health system.

Over the course of the project, PIH worked to raise awareness of cervical cancer, established cervical cancer screening and treatment services in local health centers, and helped to build local capacity to conduct VIA and cryotherapy. In addition to organizing four service provider trainings, PIH organized a training-of-trainers program to support the development of a cadre of national trainers. Further, six doctors and one nurse participated in an intensive training on the loop electrosurgical excision procedure and on colposcopy. Graduates of all of these trainings will provide needed expertise as the Government of Rwanda continues to roll out the national strategy on prevention, care, and treatment for cervical cancer, which was launched in April 2011. Evaluation data from the project will assist the Rwandan Ministry of Health (MOH) in developing a national strategy for cervical cancer.

Tanzania: Making cervical cancer screening available in clinics throughout the country: assessment of needs and logistics of service¹¹

The objective of this grant was for UMATI (the International Planned Parenthood Federation affiliate for Tanzania) to establish pilot cervical cancer screening and treatment services in four of its family planning clinics, and for those sites to serve as training centers for VIA and cryotherapy to support later expansion of screening and treatment to all its clinics in Tanzania. During the course of the project, PATH provided technical assistance through visits to project sites by Dr. Willy Mbawala of the PATH Tanzania country office. Assistance also included providing a master trainer for initial training of local providers and conducting supervisory visits to project sites.

While this project has faced a number of hurdles, through the combined efforts of UMATI and PATH Tanzania country staff, health providers have been trained, cryotherapy equipment provided, community mobilization activities launched, and screening services started. At one clinic, four providers were trained in November 2010 and refresher training was conducted in April 2011. In July 2011, the clinic carried out a mass campaign on cervical cancer screening, and in August 2011, 569 clients were screened using VIA. At another clinic, seven providers--five clinicians and two nurses --were trained in November 2011. The third clinic trained five providers and screened 1,040 clients.

Cost study

South Africa: The cost of scaling up the integrated cervical cancer prevention program in South Africa¹²

The small grants study in South Africa investigated future resource requirements for adding the HPV vaccine to the existing cervical cancer prevention program, which currently is focused on screening only. The objectives of the study included estimating the cost of scaling up the integrated prevention program (i.e., vaccination followed by screening) and developing recommendations for South African public-sector authorities on the costs associated with scaling up a comprehensive cervical cancer prevention approach.

Cost studies performed as part of the major four-country project estimated the incremental delivery costs associated with reaching young adolescent girls for HPV vaccination in India, Peru, Uganda, and Vietnam,¹ but unlike this study, they did not include estimates of costs for comprehensive screening and vaccination programs.

The findings in South Africa suggest that the extra costs of scaling up the prevention programs for cervical cancer range from US\$1.20 to US\$10.87 per capita, depending on the vaccine price and vaccine type. Although the estimated investments are not large in absolute terms, they represent an additional 4.86 percent of total public spending on health. If the vaccine price is reduced by 90 percent, this spending would be 0.75 percent—much less of a burden on the health budget but still a sizable amount. The study findings provide a contextual basis for insight into the magnitude of the financial needs for different programs. The study concluded that, provided the vaccine price is significantly reduced and the planning and management of the scaled-up response well implemented, the potential for reducing the

burden of cervical cancer in South Africa could be achieved through the integrated cervical cancer prevention program.

The South Africa study concluded that estimating costs required for achieving high coverage rates, as well as the long-term outcome associated with different combinations of screening and vaccination coverage, can help to inform decisions facing South Africa about balancing future investments in screening and vaccination.

Overall benefits of the small grants program

In addition to adding to the evidence base for planning HPV vaccination in low- and middle-income countries and for improving comprehensive cervical cancer prevention, the findings from the small grants projects suggest a number of benefits related to the value of the small grants program itself, as part of the overall *HPV Vaccines: Evidence for Impact* project.

1. Small grants for formative research allowed local researchers and planners to develop or enhance their expertise and “claim the space” of cervical cancer prevention within their countries, enabling them to have greater influence on national decisions and plans.

By engaging in research and collecting data, these leaders enhanced their expertise, increased their potential to provide well-informed advice to government at various levels, and may gain recognition from the international community. This in turn could accelerate the pace of improving cervical cancer prevention within their countries.

- The local researchers in the Argentina study were from two well-regarded institutes, Centro de Estudios de Estado y Sociedad and Consejo Nacional de Investigaciones Científicas y Técnicas, lending weight to the results of the study and increasing the likelihood that the MOH will take the results into account in planning for HPV vaccinations.
- The cost study in South Africa was conducted by a senior researcher at the University of Cape Town School of Public Health and Family Medicine Economics Unit, who has published extensively in the field of public health, including HPV vaccination. This adds weight to the findings and likelihood that the MOH will take them into account.
- The researchers in the Colombia study commented that their results would provide support for advising the MOH on the need for developing national recommendations and guidelines on HPV vaccine. In addition, the results provide a basis for developing appropriate IEC materials.

2. Small formative research or pilot projects moved cervical cancer prevention agendas forward, acting as building blocks for further activities.

Countries where formative research was conducted can use this information to guide development of a vaccine delivery strategy, a communications strategy (for outreach to communities), and an advocacy strategy (for outreach to policymakers). Pilot projects can also move a country agenda forward in implementing comprehensive cervical cancer prevention—for both vaccination and screening with treatment.

- Formative research on knowledge, attitudes, and behaviors concerning HPV vaccination in a metropolitan area in Argentina indicated that women in this setting preferred to get their doctor's recommendations for HPV vaccination, while the study in Colombia reported that both parents and physicians voiced the opinion that it was important for the government to take a stand on HPV vaccination in order for people to know whether it was an approved health intervention. Governments in these countries now have information on important issues to address in educational campaigns for HPV vaccinations.
- In Rwanda, the PIH collaborated with the MOH to establish cervical cancer screening and treatment services within four health centers in Burera district: Butaro, Kinoni, Rusasa, and Gitare. This initiative is the initial phase of a more comprehensive nationwide plan to establish cervical cancer prevention services in all districts in Rwanda over the next three years.
- In Tanzania, UMATI received funding to establish pilot cervical cancer screening and treatment services in four of its family planning clinics, and for those sites to serve as training centers for VIA and cryotherapy to support later expansion of screening and treatment to all its clinics in Tanzania. Staff were trained, cryotherapy equipment was provided, community mobilization activities were launched, and screening services have started, thus moving the national agenda to expand access to screening forward.

3. Studies funded by the small grants that published results in peer-reviewed journals or presented findings at national and regional conferences raised the visibility of cervical cancer prevention and informed the broader community.

A number of grant recipients disseminated their findings by publishing in journals, and others are planning to publish. Findings have also been presented at meetings. (See Appendix 1 for a list of all current publications.)

- Researchers in both Argentina and India published their project results in papers in *Vaccine*, a highly respected peer-reviewed journal.
- Investigators in Colombia published papers in two well-regarded peer-reviewed journals in the Latin American region, *Revista Colombiana de Cancerología* and *Cadernos de Saúde Pública*.
- Results of the study in Ethiopia were presented at two conferences: the Third Annual National Research Conference, January 26–27, 2012, in Jimma, Ethiopia; and the 13th World Congress on Public Health, April 26, 2012, in Addis Ababa, Ethiopia.
- Results of the study in Nepal were presented during International Women's Week in Nepal in March 2012. This high-level meeting was part of an advocacy effort for incorporating HPV vaccination into the national immunization program, where guests included the Secretary of the Ministry of Health and Population and a Member of Parliament who was also a former first lady and chairperson of Nepal Safe Motherhood.

Appendix 1: Summary of small grants recipient publications

Dissemination meeting report

Center for Research on Environment, Health, and Population Activities (CREHPA), Nepal Network for Cancer Treatment and Research (NNCTR). *A Study on the Challenges of HPV Vaccine Introduction and Management in Nepal*. Nepal: CREHPA, NNCTR; 2012.

Presentation abstracts

Abdissa A, Belachew T, Birhanu Z, et al. Ethiopia's readiness for the introduction of HPV vaccine. Presented at: 13th World Congress on Public Health, April 26, 2012; Addis Ababa, Ethiopia.

Abdissa A, Belachew T, Birhanu Z, et al. Ethiopia's readiness for the introduction of HPV Vaccine. Presented at: Third Annual National Research Conference, January 26–27, 2012; Jimma, Ethiopia.

Arrossi S, Paolino M. Acceptability/Uptake of HPV vaccination in Argentina: a population-based survey. Presented at: 27th International Human Papillomavirus Conference, September 17–22, 2011; Berlin, Germany.

Piñeros M, Cortés C, Wiesner C, Trujillo LM. Toma de decisiones en el ámbito local en relación con la introducción de la vacuna contra el virus del papiloma humano (VPH). *Revista Colombiana de Cancerología*. 2009;13(4):217.

Piñeros M, Cortés C, Trujillo LM, Wiesner C. Conocimientos y aceptabilidad de la vacuna contra el virus del papiloma humano (VPH) entre médicos generales, ginecólogos y pediatras en Colombia. *Revista Colombiana de Cancerología*. 2009;13(4):221–225.

Peer-reviewed publications

Arrossi S, Maceira V, Paolino M, Sankaranarayanan R. Acceptability and uptake of HPV vaccine in Argentina before its inclusion in the immunization program: a population-based survey. *Vaccine*. 2012;30:2467–2474.

Krupp K, Marlow LA, Kielmann K, Doddaiiah N, Mysore S, Reingold AL. Factors associated with intention-to-recommend human papillomavirus vaccination among physicians in Mysore, India. *Journal of Adolescent Health*. 2010;46(4):379–384.

Madhivanan P, Krupp K, Yashodha MN, Marlow L, Klausner JD, Reingold AL. Attitudes toward HPV vaccination among parents of adolescent girls in Mysore, India. *Vaccine*. 2009;27(38):5203–5208.

Piñeros M, Cortés C, Trujillo L, Wiesner C. Knowledge, acceptability and attitudes towards the HPV vaccine among Colombian general practitioners, gynecologists and pediatricians in Colombia. *Revista Colombiana de Cancerología*. 2009;13(2):88–98.

Piñeros M, Wiesner C, Cortés C, Trujillo LM. HPV vaccine introduction at the local level in a developing country: attitudes and criteria among key actors. *Cadernos de Saúde Pública*. 2010;26(5):900–908.

References

1. Levin CE, Minh HV, Odaga J, et al. Incremental costs of strategies to deliver human papillomavirus vaccine to young adolescent girls in India, Peru, Uganda and Viet Nam. *Bulletin of the World Health Organization*. In press.
2. PATH. Shaping Strategies to Introduce HPV Vaccines: Formative Research Results from India, Peru, Uganda, and Vietnam. Seattle, Washington: PATH; 2009. Available at: <http://www.rho.org/formative-res-reports.htm>.
3. Tamang A. *The Challenges of HPV Vaccine Introduction and Management in Nepal: Final Report*. Kathmandu, Nepal: Center for Research on Environment, Health, and Population Activities, Nepal Network for Cancer Treatment and Research; 2011.
4. Abdissa A. *Ethiopia's Readiness for the Introduction of HPV Vaccine: Final Report*. Jimma, Ethiopia; Addis Ababa, Ethiopia: Jimma University; Federal Ministry of Health of Ethiopia; 2011.
5. Pineros M. *Knowledge and Acceptability of the HPV Vaccine Among Parents of Adolescents, Decision-Makers and Doctors in Colombia: Final Report*. Bogota, Colombia: Instituto Nacional de Cancerología; 2008.
6. Bingham A, Drake JK, Lamontagne DS. Sociocultural issues in the introduction of human papillomavirus vaccine in low-resource settings. *Archives of Pediatrics & Adolescent Medicine*. 2009;163(5):455–461.
7. Arrossi S, Paolino M, Mazzadi A, Maceira V. *Knowledge and Attitudes Regarding HPV and HPV Vaccination in Argentina Among Women, Gynecologists and Pediatricians: Final Report*. Buenos Aires, Argentina: Centro de Estudios de Estado y Sociedad, Consejo Nacional de Investigaciones Científicas y Técnicas, Universidad Nacional De San Martin; 2010.
8. Madhivanan P. *Assessment of Acceptability of HPV Vaccine Among Parents of Adolescent Girls and Physicians' Attitudes Toward HPV Immunization. Part 1: Physicians' Attitudes toward HPV Vaccination and Intention to Recommend Immunization in Mysore, India. Part 2: Attitudes to HPV Vaccinations Among Parents of Adolescent Girls and Key Gatekeepers in Mysore, India. Final Report*. Mysore, India: Public Health Research Institute, India, C.S.I. Holdsworth Memorial Hospital; 2009.
9. Biellik R, Levin C, Mugisha E, et al. Health systems and immunization financing for human papillomavirus vaccine introduction in low-resource settings. *Vaccine*. 2009;27(44):6203–6209.
10. Partners In Health. *Introduction of Cervical Cancer Screening and Treatment into Rwandan District Health System: Final Report*. Kigali, Rwanda; 2010.
11. Mbawala W. *Supervision Report: Chama cha Uzazi na Malezi Bora Tanzania (UMATI) Project, Cervical Cancer Prevention Activities in Tanzania: Making Cervical Cancer Screening Available in Clinics Throughout the Country: Assessment of Needs and Logistics of Service*. January 2012.

12. Sinanovic E. *The Cost of Scaling up the Integrated Cervical Cancer Prevention Programme in South Africa: Final Report*. Cape Town, South Africa: University of Cape Town School of Public Health and Family Medicine; 2010.
13. Munthali A, Ngwira B, Taulo F. An Assessment of the Health System in Readiness for HPV Vaccine introduction among Adolescent Girls in Malawi. Final Report. University of Malawi Centre for Social Research, Zomba, and College of Medicine, Blantyre, Malawi. 2013.