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Chapter 25: Education, training, and communication for HPV vaccines

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Abstract

As human papillomavirus (HPV) vaccines come to market, they will face education and training challenges similar to those of other new vaccines, along with HPV-specific issues. Recent studies document stark knowledge gaps about HPV at all levels – among policy makers, healthcare providers, parents, and teens – in both the industrialized and developing worlds. Pharmaceutical companies, public health advocates, medical trainers, and health educators need to understand their diverse audiences and respond appropriately to the needs of each. They also must use research-based communication strategies and materials to most effectively, and accurately, convey the need for an HPV vaccine and to manage expectations about how the vaccine can, and cannot, protect women and men.
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1. Introduction

The successful introduction of any new vaccine depends on many factors, including the need for broad-based support from policy decision-makers, healthcare professionals, and the general public [1–5]. This support requires an appropriate understanding of the risks associated with HPV as well as the benefits, and drawbacks, of vaccination to prevent infection. While awareness of HPV is relatively high among healthcare providers in the industrialized world – and growing in the developing world – globally there is a paucity of epidemiologic data specific to countries and sub-regions, confusion about the various types of HPV, uncertainty about how HPV leads to cervical cancer, and little knowledge about HPV vaccine other than what is presented in the media. Effective HPV education and training programs must be put in place in order to achieve the public health benefits of any HPV vaccination program [6,7]. This chapter focuses on the education, training, and communication needs and strategies for HPV vaccine; related information can be found in Chapters 14, 15, 18, and 24.

Public health education is inherently difficult and lengthy, regardless of the information being communicated, and misinformation and miscommunication are frequent when a new technology or approach is introduced [3]. Target audiences and the information they require vary radically – researchers need detailed information on HPV types, clinicians need key HPV information and guidance on how best to communicate it to their patients, decision-makers want cost-effectiveness data, and parents may ask why their pre-teen should receive the vaccine. It must be remembered that within those basic audience categories there is much diversity – there are individuals with more or less capacity to absorb medical information, some who may never have attended a high-school science course, and others who cannot read at all. Further-

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When communication fails

Sometimes immunization levels drop because the *quality* of information is poor. Rumors about the safety of vaccines have been around since Jenner's day – but in the current global communication environment, misinformation travels farther and faster than ever before. In recent years rumors and misinformation have crippled efforts to vaccinate children against polio in Nigeria and India, measles in England, and hepatitis B in France, India, and West Africa. No country is immune to vaccine rumors. Conflicting messages are inevitable. Yet the impact of misinformation can be reduced when the health system is responsive to public questioning, has established effective partnerships with mass media, and when health workers have accurate information and strong ties to communities. Speedy recognition of and appropriate communication response to vaccine misinformation can be a key factor in mitigating impact.

more, the complexity of the HPV story, together with the fact that it is a sexually transmitted infection (STI), means that effective education about HPV vaccine may be especially challenging (see Table 1). A comprehensive communication strategy should take all these information needs into account and should develop different sets of messages, and different kinds of communication interventions, to meet all the varied needs.

To overcome these challenges, organizations that can influence HPV vaccine programs will need to work together to ensure that HPV and HPV vaccine messages are clear to non-specialists, factually correct, and consistent among key sources. Many different individuals and organizations should be involved, including governmental departments of health, international donor agencies, medical societies (related to cancer control, reproductive health, adolescent health, immunization, and other areas), and non-governmental organizations (NGOs) that promote health. These organizations may not normally liaise with each other, and special efforts will be necessary to facilitate linkages and coordination. To the fullest extent possible, the public health community should also coordinate its efforts with pharmaceutical companies preparing to launch their vaccines to avoid contradictory messages, confusion, and misunderstanding.

Fortunately, in recent years the world has had significant experience of introducing new vaccines in many countries, and proponents of HPV vaccination can benefit from the lessons learned with hepatitis B, *Haemophilus influenzae* type b, and rotavirus vaccines.

2. Reaching health-policy makers

Health policymakers are generally not experts in the field of cervical cancer prevention, so in order to make informed

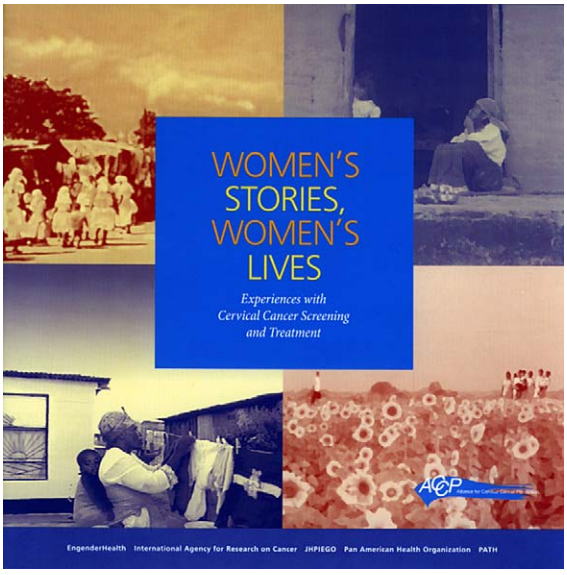
Table 1
Key challenges relating to effective communication about new HPV vaccines

In some areas there is limited understanding about cervical cancer and its impact on women. This is especially true among the most vulnerable populations in developing countries.
The public has low awareness about the risks of HPV. Both patients and providers may confuse HPV, HBV, HSV, and HIV[*].
Healthcare policy makers and providers have significant gaps in their knowledge of HPV and HPV vaccine. Because new data are being generated rapidly, it is difficult for them to stay up-to-date.
There currently is no established strategy for describing the vaccine—is it a vaccine against an STI? against cancer? Different producers and organizations may take different approaches, which could lead to confusion.
The industrialized and developing worlds lack data on HPV incidence and prevalence, and developing countries often lack epidemiological information on cervical cancer. Further, the impact of HPV vaccination (lowered incidence of cervical cancer) will not be measurable for years. If decision-makers insist on waiting for local epidemiological data or vaccine impact data from other countries, introduction of the vaccine could be delayed significantly in some places.
The vaccine may provide different levels of benefit to different vaccinees. Sexually active girls and women may not see the same effect against prevention of cervical dysplasia and cancer as populations that have not initiated sexual contact. Moreover, if boys are also vaccinated, they may not reap equal health benefits.
Uncertainties remain relating to a number of critical vaccine efficacy issues. For example, it is unclear whether an HPV vaccine booster will be required for adequate long term protection. It may also be desirable in some countries to add protection against additional HPV types to a vaccine. This could be confusing both for policy-makers and healthcare providers.
Cervical cancer screening needs to continue as the vaccines only cover two oncogenic HPV types. Screening recommendations may have to change (when to start? how often to screen?) based on vaccination status to increase cost-effectiveness.
Healthcare providers, especially doctors, often feel uncomfortable discussing sexual issues; traditionally, they only discuss HPV when a patient presents with a genital wart or cervical abnormality [8]. Providers must be trained to discuss the vaccine with girls and their parents before onset of sexual activity.
The sexually transmitted nature of HPV may generate concerns about promoting youth sexual behavior.
Some parents are concerned about immunizing their children with too many vaccines.

[*] HPV, human papillomavirus; HBV, hepatitis B virus; HSV, herpes-simplex virus; HIV, human immunodeficiency virus.

decisions about new approaches to cervical cancer prevention they need a range of clear, accurate, and up-to-date information on HPV, cervical cancer, screening and treatment, and HPV vaccine. Health policymakers include legislators, ministry of health and ministry of finance officials, leaders of medical/health professional associations, and cancer/health institutes, and influential NGOs and women's health advocates. Information needs to be summarized in terms that non-experts can easily understand and presented in a way that facilitates comparisons with existing or proposed health interventions [9]. Modeling of health outcomes and cost-benefits is a convenient means to condense a wide range of data (burden of disease, vaccine effectiveness, anticipated coverage of the target population, and time required to measurable disease reduction) into summary statistics that are of direct relevance to public health decision-making.

A 2005 PATH survey of policymakers from 12 developing countries found that they generally view cervical cancer as an important health problem and that there is considerable interest in HPV vaccine, although current technical information that is essential to informed decision-making, such as national burden-of-disease data, cost-effectiveness data comparing vaccination to other health interventions, and information on national capacity to introduce vaccine, is often unavailable or inaccessible. Furthermore, many policymakers anticipate that there will be community-level resistance to an HPV vaccine program based on concerns about vaccinating adolescents against a sexually transmitted virus. They need information to address these issues [10].



Some people respond better to hard data, others react best to personal stories, and most appreciate both. This booklet for high-level decision-makers emphasizes the human face of cervical cancer [11].

In designing programs to communicate with health policymakers, it is important to recognize that they must consider many competing interests while trying to achieve the best overall balance in the provision of healthcare for the populations they serve. With regard to HPV vaccination, the benefits of preventing future disease will therefore be compared to those of addressing the immediate needs of people who are already ill or injured and may be assigned lower priority. In addition, policymakers must take into account the fact that screening programs have already produced, or have the potential to produce, measurable reductions in cervical cancer incidence and mortality. Understanding the appropriate balance between primary prevention programs (vaccination) and secondary prevention programs (screening and treatment) will be important for the decision-making process.

Keeping these issues in mind, there are a number of specific informational needs required for health policymakers to properly position HPV vaccination within the context of other approaches to cervical cancer prevention, broader health needs and opportunities, and the absorptive capacity of the health delivery infrastructure. This information is outlined in Table 2.

The process of communicating with health policymakers will vary according to the specific circumstances within their jurisdiction and their level of interest/awareness in cervical cancer and HPV. In developed nations, a substantial driving force will come from the pharmaceutical industry, which will provide a range of information on issues key to introducing HPV vaccine (particularly into upper- and middle-income markets). Given the information requirements for product licensure, governmental health departments in many developed countries have already convened, or are in the process of convening, panels of non-industry associated experts to assess the information coming from industry. These forums are efficient means for communicating with health policymakers in many developed nations. Other important mechanisms for educating policymakers include proceedings from professional meetings and syntheses of important journal supplements, among others. Material of a highly technical nature should be summarized or "translated" for non-scientists.

In developing countries, guidelines and technical updates from key global agencies, including the World Health Organization (WHO), are influential to country-level decision making [12]; for example, in May 2006, the WHO drafted a *Preparing for HPV vaccines: contributions of sexual and reproductive health programs* "guidance note," which is intended to "alert a broad array of stakeholders in sexual and reproductive health, vaccination, child and adolescent health and cancer control programs to several of the key issues surrounding the upcoming introduction of new vaccines against cervical cancer." The Global Alliance for Vaccines and Immunizations (GAVI) was an organization formed to harness the strengths and experience of multiple partners in immunization (see www.gavialliance.org). Besides GAVI Alliance forums, international health meetings, updates from

Table 2
Policy-maker information: needs and uses

Information need	How the information could be used
Natural history of HPV and cervical cancer	Ensure decisions are made with an accurate understanding of disease progression
Burden of HPV and cervical cancer and current health disparities in cervical cancer	Ensure burden of disease and impact on women's health is understood
Health outcomes and cost-effectiveness estimates from modeling	Understand long-term benefit of vaccination program and compare of the impact of HPV vaccination to other proposed or existing health interventions
Analyses of the interaction of HPV vaccination with existing cancer prevention strategies	Assess the roles of HPV vaccination and secondary prevention in reducing cervical cancer morbidity and mortality and decreasing the cost of cancer screening and managing Pap smear abnormalities
Clear explanation of the rationale underpinning the choice of target group	Overcome possible resistance to vaccination of young adolescents; plan strategy for delivering vaccine to target group, education programs, etc.
Analysis of the potential for providing HPV vaccine in conjunction with other vaccines or health interventions	Plan for inclusion of HPV vaccine into existing vaccination programs or for the launch of new vaccination programs
Analysis of supply, demand, and affordability of vaccine	Plan for stable vaccine supply and for logistics of vaccine delivery (phased implementation, choice/restriction of target groups, etc.)

professional societies, and recommendations from national regulatory groups also play a role in influencing the decision-making process. In all settings, it is crucial to encourage interested parties to coordinate their information submissions.

3. Reaching healthcare providers

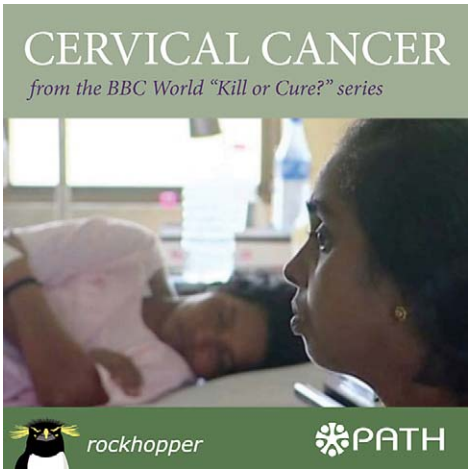
Healthcare providers are a key audience for HPV vaccine-related communication and training for several reasons. Healthcare providers include those who may be involved in delivering or discussing HPV vaccine through immunization services, adolescent health centers, women's health centers, cancer care centers, school health programs, and, in many countries, private pharmacies. They need to know how and why the vaccine is important, and understand the vaccine's limitations, including that it does not protect against all HPV types linked to cervical cancer. Providers also function as advisors to policymakers in government and in healthcare institutions, and, in most cultures, providers are considered the primary and most trusted source of health and vaccine information by members of the general public [1,2,8,13]. Provider endorsement will be a key determinant of HPV vaccine acceptance by parents and potential vaccine recipients [14]. Therefore, providers will need training, education, and communication tools to facilitate effective discussions with their patients, such as simple talking points and visual aids.

In the United States, focus group discussions and large-scale surveys conducted in 2002 and 2004 reported similar findings: HPV-related knowledge was not up-to-date, especially among primary-care clinicians [8,15]. Key knowledge gaps included basic information on HPV natural history and types, and the management, treatment, and prevention of HPV disease. More specifically, there was confusion about the link between genital warts and cervical cancer and the effectiveness of condom use for reducing the risk of HPV infection. Only 35% of respondents knew that most genital HPV infections clear without treatment, only 47% knew that the HPV types associated with genital warts differ from those usually associated with cervical cancer, and only 63% believed that HPV infection increases the risk of anogenital cancer in men [15]. In a study of 225 general practitioners (GPs) from Norway, the majority knew that cervical cancer is caused by HPV, but 60% admitted to having limited knowledge and the majority did not know where to get reliable information [16].

The situation is no better in the developing world. For example, one study has documented that providers sometimes get confused between HPV, HBV (hepatitis B virus), HSV (herpes-simplex virus), and HIV (human immunodeficiency virus) [17]. Another survey of 1,206 GPs, obstetricians, and gynecologists in Mexico found that while 80% correctly identified HPV as the cause of cervical cancer, the majority lacked further knowledge about this association and often confused the clinical outcomes of the low- and high-risk HPV types [7]. Lack of national data on type-specific HPV incidence and prevalence can result in the HPV problem being "invisible" to everyone except specialists and researchers.

When asked, providers uniformly demand HPV clinical training curricula, clinical decision support tools, and materials to facilitate patient counseling and education. They also request easy access to updated information about HPV from respected and authoritative sources [8,16]. One must keep in mind that papers published in expensive, peer-reviewed journals, or offered for download from the web, are not accessible to providers in much of the developing world. Other channels are needed to inform those audiences.

In addition to medical journals and other publications, effective ways of reaching providers include in-service trainings or Continuing Medical Education courses for credit, HPV information embedded in bulletins from employers or professional associations, forums and panel discussions during conferences, and the creation of resource websites and email discussions for those who can access them; for example, the Alliance for Cervical Cancer Prevention website



Film can be a powerful medium for reaching many audiences with less technical information. This 2005 documentary was broadcast on BBC World, which reaches over 100 million viewers.

(ACCP), www.alliance-cxca.org. Finally, advocates for HPV vaccine may wish to reach out to a diverse range of public health specialties with an interest in the topic, especially those focused on immunization, Ob/Gyn issues, STIs, and cancer control.

4. Reaching the general public

As HPV vaccine programs are launched it will be crucial to provide accurate, clear, simple, and readily digestible information to educate the public about HPV, cervical cancer, and vaccine programs so that they can distinguish truth from misinformation, and assess their own level of vaccine risk and benefit. For this article, we include as general public parents, adolescents, local politicians, civil society and community leaders, religious leaders, teachers, and media representatives. Ideally, the communication process encompasses integrated educational programs that deliver information through multiple media so that clients can access the information appropriate for their personal circumstances and progress to more complex information as required.

In many regions, it will be important to raise understanding about cervical cancer and the fact that it is a largely preventable disease with regular screening and follow up. For instance, in developing countries, there is a relatively low level of understanding about cervical cancer and its impact on women and their families [12,18]. There are knowledge gaps in the industrialized world as well. For instance, interviews with a representative sample of the general public in Britain found that less than 1% were able to name HPV as the cause of cervical cancer and only 14% were aware of a link between cervical cancer and a sexually transmitted infection [19]. Similar results were found in a survey of a random selection of the general population in Germany, where only 3.2% knew that HPV was a risk factor for cervical cancer [20].

HPV message-testing research remains limited in most parts of the world, but studies in the US have revealed that information about HPV may be confusing, anxiety-provoking, and stigmatizing [21–23]. For example, when presented with plain-language information about HPV, adults expressed confusion about the HPV–cervical cancer link, the distinction between high- and low-risk HPV types, and how HPV could be both incurable and transient [24]. Information about the asymptomatic and incurable nature of HPV and the high prevalence and ease of transmission caused anxiety and concern. Finally, despite audience understanding of the commonness of HPV, it was noted that discussions of HPV would prompt accusations and suspicions of infidelity within a relationship [16,25]. Communication programs must carefully assess these concerns and address them in communication materials as necessary.

In addition to information about cervical cancer and HPV, it will be necessary to provide basic information about the vaccine's safety, efficacy, side-effects, degree and duration of protection, and cost so that families can make informed decisions about vaccine use [14,21,26,27]. They must also understand the need for vaccination, the logistics for receiving the vaccine, and the recommended schedule of delivery [1]. Vaccine messages must be strategically crafted to accurately convey HPV risk and create appropriate demand for the vaccine, without creating undue anxiety or exaggerated promises [28,29].

HPV communications must be sensitive to the concerns among some groups that the use of HPV vaccine may encourage or condone youth sexual behaviors. It should also be noted that 15 years ago some individuals expressed the same objection to hepatitis B vaccination. Similar to HPV, hepati-

What works to increase demand for and use of health and immunization services?

- Clients understand their risk and the consequences of infection.
- Healthcare providers encourage use of intervention and have good counseling skills.
- Positive images of product are featured in media and in community consciousness.
- Vaccine is readily available as part of reliable, high quality health services.
- Client reminder systems are in place.
- A supportive policy environment exists, for instance vaccination is required for school entry and subsidized services are available for the poor.
- Client's out-of-pocket costs are minimal.

Addressing opposition to HPV vaccination on political or religious grounds

- Most people support vaccination and believe that the benefits outweigh the risks.
- When there is opposition, it often is due to misunderstanding or lack of information.
- Some individuals or organizations may oppose HPV immunization on moral, religious or philosophical grounds.
- It is not the role of the public health community to directly address value-laden issues. Instead, information and education resources should be allocated to reaching individuals who seek and value science-based medical information. That said, religious and other social leaders can be excellent partners for dealing with values issues.
- The best way to address opposition is by providing accurate, readily consumable, accessible, and science-based information from credible sources.
- Sometimes it is necessary to directly respond to misinformation in the press, while at other times a response may only fan the flame and amplify the noise. Be strategic in choosing your communication battles.

tis B is both an STI and a cause of cancer and the hepatitis B vaccine was, at that time, recommended for "at-risk" populations, including teens who were not yet sexually active. No one objects to hepatitis B vaccine on those grounds any more, and it is now provided as part of routine vaccination programs around the world.

In addressing these types of concerns, it is vital to emphasize the ubiquitous nature of HPV infection, the benefits of the vaccine, and the importance of conferring immunity prior to sexual activity for full benefit [14]. It may also be important to articulate what the vaccine *will not* protect against to ensure that vaccinees continue to seek recommended cervical cancer screening (where available) and practice safer sex behaviors. Ensuring ready access to clear, science-based information is key (see text box above).

Parents and caregivers – the decision makers for childhood vaccines – will be an important primary audience for communication about HPV vaccine. They will also be an important secondary audience as their attitudes toward vaccination are a major predictor of adolescent attitudes towards vaccines [30]. Potential vaccine recipients, including children, adolescents, and young adults, may also be targeted directly. Innovative strategies have been developed for reaching youth with vaccine information and helping them disseminate this information to their parents and other adult decision-makers [31].

In many developing countries, and in underserved populations in the developed world (e.g. minorities, immigrants, and native populations), vaccination rates tend to be relatively low, and reaching young adolescent girls with vaccine may be particularly challenging [32,33]. Cervical cancer is common among poor and underserved women, therefore communication strategies must consider special messaging efforts to reach these populations. There is currently a paucity of available HPV and cervical cancer prevention materials that are appropriate for clients with low literacy and for culturally and linguistically diverse audiences in the US [34,35], and relatively few culturally appropriate materials have been created in developing world countries, although some materials have been produced through the work of the ACCP and others. Efforts to develop appropriate communications for women with limited or no reading skills, and who may not have regular media or healthcare access, should involve target audiences throughout the development and testing process [36].

Finally, it will be critical to extend the reach and credibility of vaccine communications through partnerships with community-based, public, and private organizations and networks. These channels may be particularly important in resource-poor settings, where members of the public lack access to mass media channels or may not trust government or health authorities [1]. Community outreach and mobilization activities, including involvement of local leaders, can also have great impact [18].

5. Discussion – challenges and opportunities

5.1. Filling communication research gaps

While the key scientific facts supporting HPV vaccines will apply cross-culturally, messages will need to be carefully crafted and adapted to local needs and values. The task ahead may be particularly daunting, given the insufficient level of funding that is typically allocated to vaccine communication research activities [1].

To the greatest extent possible, primary and secondary research should be conducted to analyze the local communication environment, select target audiences, and develop appropriate communication goals, objectives, and strategies [3,36–38]. Prior to strategy development, communicators should conduct informal needs-assessments to explore (a) the lessons learned from past vaccine and cervical cancer prevention efforts that have succeeded or failed; (b) the opportunities and threats in the political, social, media, and public health environments that may facilitate or inhibit HPV vaccine communications; (c) potential partnerships to expand the reach, credibility, and impact of messages.

Communicators need an in-depth understanding of target audiences to develop effective and appropriate strategies [37,39]. This is true whether the intended audience is the public, policymakers, or healthcare providers. Such data can be

obtained informally and at relatively low cost in resource-poor settings. Qualitative research such as focus groups, interviews, and meetings with community leaders is often the most useful approach for exploring audiences' knowledge, attitudes, beliefs, behaviors, and communication needs and preferences. Qualitative research should also assess target audiences' perceived benefits, costs, and barriers to HPV vaccination; the settings in which they may be most receptive to and able to act upon vaccine messages; trusted and acceptable channels for vaccine messages; and how the vaccine fits within the audience's social and cultural values and understandings of health, illness, prevention, and immunization. Quantitative (survey) data may be useful in profiling audiences and informing these qualitative research questions and for rigorous evaluation of education and training programs.

Qualitative research should also be used to test the effectiveness of concepts, materials, and messaging, evaluate alternative strategies or tactics, and fine-tune prior to implementation. This research can identify what audiences find most appealing, relevant, motivating, or memorable, and ensure that strategies are appropriate, understandable, and non-offensive. Already, in anticipation of the vaccine, some have begun evaluating HPV vaccine educational material intended to improve knowledge and acceptability among parents [13].

Ongoing process evaluations (e.g., materials tracking, surveys, focus groups, etc.) can assess when, where, how often, and which audiences are being reached. Successes and failures that are identified during this process can help communicators guide and refine programming. Outcome evaluations, such as pre- and post-intervention surveys, cross-sectional surveys, and panel surveys can assess whether communications are achieving their desired goals. This requires the establishment of a framework of outcomes, including realistic goals (i.e., changes in attitudes, knowledge or behavior), from the outset, and the measurement of benchmarks of success. While evaluations can be costly and time-consuming, numerous studies have documented the positive impact of well-designed, research-based communication interventions on achieving desired health outcomes [37,39,40].

5.2. Coordinating communication campaigns

As HPV vaccine is introduced around the world, it will be important for various stakeholders to coordinate communication about the vaccine. These stakeholders include government and NGOs as well as, wherever possible, the pharmaceutical industry. Pharmaceutical manufacturers will undertake targeted education/advertising campaigns to coincide with product launch, and these campaigns will likely be broad-reaching and influential. Public campaigns will also raise awareness and demand for HPV vaccine, including among clients with less access to healthcare services and with limited ability to pay for vaccine. Wherever possible, private- and public-sector messages should be coordinated to avoid confusion among policymakers, providers, and the public. Where direct advertising is aimed at middle- and upper-income audiences, public-sector communication campaigns will need to take the advertising messages into account in designing specific approaches and information. In all cases, it is important that demand-creation campaigns be accompanied by assurance that sufficient vaccine will be available at a price that all intended audiences can accommodate. Working with manufacturers as well as national, regional, and global vaccine funders will be crucial to understanding supply and demand scenarios and to designing appropriate communication campaigns.

The launch of two different vaccines that protect against different HPV types will also need to be addressed from a communication perspective. The quadrivalent Merck vaccine protects against HPV-16 and -18 as well as types 6 and 11, which cause genital warts but not cervical cancer, and may be promoted as a vaccine against both cervical cancer and sexually transmitted warts for use among girls as well as boys. The GlaxoSmithKline vaccine protects only against HPV types 16 and 18, and may be primarily promoted as a vaccine for girls to protect them against cervical cancer. Where both vaccines are available in the same area, these vaccine differences, and the different promotional messages, may present communication challenges.

5.3. Implementing educational strategies in advance of vaccine availability

Much can be done to create a strong foundation for rapid and appropriate introduction of HPV vaccine even before it becomes available through public-sector programs in a given country. For instance, the rotavirus accelerated development and introduction program (ADIP) faces some of the same challenges faced by HPV, namely low public awareness of the disease, fragmented healthcare provider and decision maker understanding of the disease, and incomplete understanding of the key role of vaccine in disease control. Like a future HPV product, rotavirus vaccine has the potential to help multiple policymakers meet their goals – policymakers who may not currently collaborate or participate in existing alliances – including the diarrheal disease community, the nutrition community, the child survival community, and the immunization community. To address these challenges, the ADIP has launched several communication initiatives to set the stage for future public health strategies that may include rotavirus vaccine, once it is widely available. Key target audiences at the pre-vaccine-availability stage are policymakers and higher-level medical professionals. Direct outreach to frontline workers, parents, and caretakers becomes a priority only when the vaccine is broadly available. Therefore, the ADIP currently encourages and supports accurate press reporting about rotavirus. Those stories will reach the general public and prepare them to agree to the use of the vaccine when it is available.

6. Summary and recommendations

HPV vaccine education and training programs should work systematically to understand the needs of different audiences and provide clear and accurate information through appropriate channels to meet those needs. While HPV vaccine presents some specific communication challenges, there is much experience to build on from other vaccine introduction programs and from the experience of various sexual and adolescent health programs. Furthermore, established research strategies for assessing audience information needs and concerns can be used to inform and guide effective communication strategies and messages.

A diverse variety of communication mechanisms will be necessary to efficiently get evidence-based, accurate, and understandable information to those who need it, especially in the early stages of HPV vaccine introduction. Given the burden of cervical cancer in many developing countries, and among underserved populations in developed countries, there is a special need for effective communication strategies for those populations.

To ensure as much consistency as possible, HPV vaccine programs should promote coordination among a wide range of public- and private-sector organizations and stakeholders that can provide information about HPV and HPV-vaccine. Where inconsistent messages are unavoidable, i.e., when one company might choose to market an HPV product as a vaccine against cancer while another labels it a vaccine against an STI, communication programs should develop messages and resources to explain the inconsistencies. A wide array of partners should be poised to respond strategically to rumors or misinformation and to minimize adverse impact on new programs.

Effective communication strategies will be an essential component of any successful HPV vaccine program, as they have proven to be for other newly introduced vaccines against hepatitis B, Hib, and rotavirus. As HPV vaccines are introduced worldwide, it will be important for communication professionals to evaluate the effectiveness of specific communication strategies and campaigns, and share experiences with other programs and professionals around the world.

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References

[1] Waisbord S, Larson H. Why Invest in Communication for Immunization: Evidence and Lessons Learned. A joint publication of the Health Communication Partnership based at Johns Hopkins Bloomberg School of Public Health/Center for Communication Programs (Baltimore) and the United Nations Children's Fund (New York), June 2005.

[2] Streefland PH. Introduction of a HIV vaccine in developing countries: social and cultural dimensions. Vaccine 2003;21(13–14): 1304–9.

[3] Wittet S. Hepatitis B. Vaccine Introduction: Lessons Learned in Advocacy, Communication, and Training. Seattle: PATH; 2001. Available from: http://childrensvaccine.org/files/CVP_Occ_Paper4.pdf.

[4] Garpenholt O, Fredlund H, Timpka T. Immunization against *Haemophilus influenzae* type b in Sweden—a study of the introduction process. Scand J Public Health 2001;29(4):271–8.

[5] Bresee JS, Hummelman E, Nelson EA, Glass RI. Rotavirus in Asia: the value of surveillance for informing decisions about the introduction of new vaccines. J Infect Dis 2005;192(Suppl. 1):S1–5.

[6] Kahn JA, Rosenthal SL, Hamann T, Bernstein DI. Attitudes about human papillomavirus vaccine in young women. Int J STD AIDS 2003;14(5):300–6.

[7] Lazcano-Ponce E, Rivera L, Arillo-Santillan E, Salmeron J, Hernandez-Avila M, Munoz N. Acceptability of a human papillomavirus (HPV) trial vaccine among mothers of adolescents in Cuernavaca, Mexico. Arch Med Res 2001;32(3):243–7.

[8] Centers for Disease Control & Prevention. HPV Communication Outreach, Report No. 2001-Q00133 (E-40). Atlanta, GA, 2002.

[9] Herdman C. Changing minds: identifying policymakers' information needs related to cervical cancer prevention. International Network for the Availability of Scientific Publications (INASP) Newsletter, No. 27, November 2004. p. 3–4.

[10] PATH. HPV vaccine stakeholder opinions survey analysis. PATH, unpublished data, 2005.

[11] Alliance for Cervical Cancer Prevention. Women's stories, women's lives: experiences with cervical cancer screening and treatment. Seattle: ACCP; 2004.

[12] Sherris J, Agurto I, Arrossi S, Dzuba I, Gaffikin L, Herdman C, et al. Advocating for cervical cancer prevention. Int J Gynaecol Obstet 2005;89(Suppl. 2):S46–54.

[13] Davis K, Dickman ED, Ferris D, Dias JK. Human papillomavirus vaccine acceptability among parents of 10- to 15-year-old adolescents. J Low Genit Tract Dis 2004;8(3):188–94.

[14] Zimet GD. Improving adolescent health: focus on HPV vaccine acceptance. J Adolesc Health 2005;37(Suppl. 6):S17–23.

[15] Centers for Disease Control & Prevention (CDC). Final Report on HPV Clinician Survey: Knowledge, Attitudes, Practices about Genital HPV Infection and Related Conditions. Contract No. GS23F8167H. Atlanta, GA 2005.

[16] Havnegjerde T, Thoresen S. Knowledge of human papillomavirus among general practitioners in Norway. In: Proceedings of the 21st international papillomavirus congress. 2004.

[17] PATH. Introducing HPV vaccines in developing countries: overcoming the challenges. Seattle: PATH; 2005 (available from: www.path.org/files/RH_hpv_intro.pdf).

[18] Alliance for Cervical Cancer Prevention. Improving screening coverage rates of cervical cancer prevention programs: a focus on communities. Seattle: ACCP; 2004 (Cervical Cancer prevention Issues in Depth, No. 4).

[19] Waller J, McCaffery K, Wardle J. Beliefs about the risk factors for cervical cancer in a British population sample. Prev Med 2004;38(6):745–53.

[20] Klug SJ, Hetzer M, Blettner M. Screening for breast and cervical cancer in a large German city: participation, motivation and knowledge of risk factors. Eur J Public Health 2005;15(1):70–7.

[21] Centers for Disease Control & Prevention. STD Communications Database: General Public Focus Group Findings, Final Report. Prepared by ORC Macro, Atlanta, GA, February 2004. Available at http://www.cdc.gov/std/healthcomm/stdcom-db-focus.htm.

[22] Centers for Disease Control & Prevention (CDC). Human Papillomavirus Creative Materials Testing: Target Audience

Focus Group Research, Final Report. Prepared by Ogilvy Public Relations Worldwide and CDC, Atlanta, GA, April 2005. Available from: http://www.cdc.gov/std/HPV/genaud4-2005/MaterialsTestingReportGenAud4-2005.pdf.

[23] Friedman A, Shepeard H. Developing effective communication approaches to educate the public about HPV: findings from concept testing research with general audiences. In: Poster presented at the 22nd international papillomavirus conference and clinical workshop, April 30–May 6. 2005.

[24] Friedman A, Shepeard H. Developing low-literacy materials to promote HPV awareness and education among members of the American public: findings from message testing research. In: Poster presented at the 16th biennial meeting of the international society for sexually transmitted disease research (ISSTDR), July 1–13. 2005.

[25] Anhang R, Wright Jr TC, Smock L, Goldie SJ. Women's desired information about human papillomavirus. Cancer 2004;100(2):315–20.

[26] Kahn JA, Bernstein DI. Human papillomavirus vaccines and adolescents. Curr Opin Obstet Gynecol 2005;17(5):476–82.

[27] Calloway C, Jorgensen C, Saraiya M, Tsui J. A content analysis of news coverage of the hpv vaccine by US newspapers, Jan 2002–June 2005. J Women's Health, in press.

[28] Melo-Martin I. The promise of the human papillomavirus vaccine does not confer immunity against ethical reflection. Oncologist 2006;11(4):393–6.

[29] Friedman A, Shepeard H. Exploring the knowledge, attitudes, beliefs, and communication preferences of the general public regarding HPV: findings from CDC focus group research and implications for practice. Health Educ Behav, in press.

[30] Zimet GD. Improving adolescent health: focus on HPV vaccine acceptance. J Adolesc Health 2005;37(Suppl. 6):S17–23.

[31] Smith T, Wittet S. Helping Young People Become Youth Advocates for Immunization, prepared for the Children's Vaccine Program, August 2000. Available from: http://childrensvaccine.org/files/CVP_Occ_Paper3.pdf.

[32] Chowdhury AM, Bhuiya A, Mahmud S, Abdus Salam AK, Karim F. Immunization divide: who do get vaccinated in Bangladesh? J Health Popul Nutr 2003;21(3):193–204.

[33] Coleman CL. Immunizations: a health disparity concerning African-American children and implications for community health. J Natl Black Nurses Assoc 2004;15(1):32–5.

[34] Brandt HM, McCree DH, Lindley LL, Sharpe PA, Hutto BE. An evaluation of printed HPV educational materials. Cancer Control 2005;12(Suppl. 2):103–6.

[35] Hunter JL. Cervical cancer educational pamphlets: do they miss the mark for Mexican immigrant women's needs? Cancer Control 2005;12(Suppl. 2):42–50.

[36] Younger E, Wittet S, Hooks C, Lasher H. Immunization and child health materials development guide. Seattle: PATH; 2001 (available from: http://childrensvaccine.org/files/CVP-Materials-Development-Guide.pdf).

[37] Kotler P, Roberto N, Lee N. Social marketing: improving the quality of life. 2nd ed. Thousand Oaks, CA: Sage Publications; 2002.

[38] GAVI. Advocacy for Immunization. GAVI. 2001. Available from: http://childrensvaccine.org/files/GAVI-AdvocacyHandbook.pdf.

[39] National Cancer Institute, National Institutes of Health, Public Health Service, US Department of Health & Human Services. Making Health Communication Programs Work. NIH Publication No. 02-5145. September 2002.

[40] Institute of Medicine, Board on Neuroscience and Behavioral Health, Committee on Communication for Behavior Changes in the 21st Century: Improving the Health of Diverse Populations. Speaking of Health: Assessing Health Communication Strategies for Diverse Populations. Washington, DC: National Academies Press, 2002.