



Report

Human Papillomavirus:
Epidemiology and Immunization
a Global Health Consortium Satellite Workshop

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Topic	Page number
Human Papilloma Virus	3
Agenda	4
Moderator and Opening Remarks	4
Speakers	5
Presentation Summaries	6
➤ A systematic review examining change in risky sexual behaviors after HPV vaccination among adolescents and adult females	6
➤ HPV vaccination: beyond behavioral theories to the realities of HPV vaccine completion in the United States	6
➤ The importance of high quality provider recommendations to facilitate adoption of HPV vaccination in the US	6
➤ HPV vaccination policies in the United States “Black Belt”	7
Closing Remarks and Conclusions	8
Authors	8

Human Papilloma Virus

Nearly one in every four people is infected with at least one strain of Human Papillomavirus (HPV) in the United States. HPV infections are responsible for nearly 26,000 new cancer cases each year in the United States. Of these, 18,000 occur in women and 8,000 occur in men. HPV also causes more than 300,000 cases of genital warts and approximately 820 cases of juvenile-onset RRP with a combined cost of \$8 billion per year. Although cervical cancer is the cancer most commonly associated with HPV, the virus plays a significant role in other anogenital cancers in both men and women. These include cancers of the vulva, vagina, and anus in women and cancers of the anus and penis in men.

The Advisory Committee on Immunization Practices (ACIP) recommends routine HPV vaccination for male and female adolescents ages 11-12. Vaccination may begin at age 9 and catch-up for vaccination is recommended for all females' ages 13-26 and all males' ages 13-21, and ages 22-26 for men who have sex with men. In the nine years that have followed since the U.S. Food and Drug Administration approved the Human HPV vaccine for females in 2006 and for males in 2009, HPV immunization completion rates have remained well below the projected rates of immunization for both boys and girls nationally. Protecting children from future HPV related cancers has been the subject of numerous studies, and low HPV vaccination rates noted by Presidents Cancer Panel are a focus of concern and action for 2015. As healthcare professionals specialized in immunization and the care of children, it is incumbent upon us to respond by reviewing our own personal healthcare practice and rates of HPV vaccine series completion for our own patients and the communities we serve.

One of the Healthy People 2020 goals is to increase the vaccination coverage for a complete series of HPV vaccine for children between the ages of 13 and 15 year to at least 80%. Currently, according to the CDC, 4 out of 10 girls and 6 out of 10 boys are unvaccinated in the U.S. Furthermore, the HPV vaccination completion rates for adolescents aged 13 to 17 years in the U.S. were under 40% as of 2014. Uptake of HPV vaccines has not kept pace with that of other adolescent vaccines and has stalled in the past few years. In 2012, only 53.8 percent of 13- to 17-year-old girls had received the first HPV vaccine dose, and only 33.4 percent had completed all three recommended doses. These levels are nearly identical to what was observed in 2011 and fall considerably short of the Healthy People 2020 goals.

The Global Health Consortium at Florida International University (FIU) organized a workshop on November 17th, 2015. Human Papillomavirus (HPV) epidemiology, the status of the immunization uptake, and the completion of the vaccine schedules

The main objectives of the workshop were to:

- Identify the challenges and opportunities to improving the effectiveness of HPV vaccination
- Evaluate the strategies for leaders in the healthcare system as well as the community leaders to improving engagement to increase HPV vaccination
- Foster collaboration with the GHC towards efforts to obtain research funding.

Agenda

Human Papillomavirus Vaccination	
Introduction and Opening Remarks	Dr. Lina Bofill (Chair)
A systematic review examining change in risky sexual behaviors after HPV vaccination among adolescent and adult females	Dr. Purnima Madhivanan
HPV vaccination: beyond behavioral theories to the realities of HPV vaccine completion in the United States	Dr. Tami Thomas
The importance of high quality provider recommendation to facilitate adoption of HPV vaccinations in the United States	Dr. Susan Vadaparampil
HPV vaccination policies in the U.S. Southern Black belt	Ms. Dudith Pierre-Victor
Panel Discussion	

Moderator

Lina Bofill MD, MPH, FACP

Assistant Director

Global Health Consortium Florida International University

Lina Bofill is an infectious disease specialist from Venezuela, where she was director of the HIV/AIDS Clinic at Hospital Vargas de Caracas and faculty at the affiliated teaching hospital of the Universidad Central de Venezuela. She has been a faculty member at the University of Miami Miller School of Medicine and FIU Herbert Wertheim College of Medicine at Florida International University. She currently serves as the Assistant Director of the FIU Global Health Consortium.

Opening Remarks

Dr. Lina Bofill, opened the workshop with welcoming remarks. She emphasized the growing recognition of the importance of global health in world affairs. Dr. Bofill explained that the center is committed to develop the platform to expand the immunization programs in the region. Dr. Bofill served as moderator for the workshop presentation.

“The workshop serves as a platform for brainstorming to identify important opportunities and challenges to improving the effectiveness of HPV vaccination. Strategies for leaders in healthcare and community engagement to increase HPV vaccine series completions are needed. The overarching goal of the workshop is to foster collaboration among people in the region”

Speakers

Purnima Madhivanan MD, PhD, MPH

*Associate Professor, Director of the Epidemiology Ph.D. Program
Robert Stempel College of Public Health
Florida International University, Miami, Florida*

Purnima Madhivanan is an Associate Professor in Epidemiology at the Robert Stempel College of Public Health at Florida International University. A physician by training, she has a Master's degree in Public health and PhD in Epidemiology from the University of California, Berkeley. For the past 15 years, her work has focused on research in disadvantaged population and works developing interventions that address health disparities globally, among rural populations particularly women and children.

Tami Thomas, PhD, RN, CPNP, FAANP, FAAN

*Associate Professor
Associate Dean of Academic Affairs
Nicole Wertheim College of Nursing and Health Sciences
Florida International University, Miami, FL*

Tami Thomas is an Associate Professor and Associated Dean for Academic Affairs at Florida International University in Miami, FL. She is a lifelong advocate of underserved children and their families. Her research in the areas of population specific risk factors for sexually transmitted infections and the Human Papillomavirus vaccine has been funded since 2009. Her current research focuses on interventions to disseminate health care innovations, such as the HPV vaccine to adolescent and pediatric populations experiencing health disparities in rural areas.

Susan Vadaparampil, PhD, MPH

*Associate Member
Department of Health Outcomes and Behavior
Division of Population Science
Moffitt Cancer Center, Tampa, FL*

Dr. Vadaparampil's research uses a combination of behavioral science, epidemiology, health services, and clinical perspectives to understand and improve dissemination and uptake of new cancer prevention and control innovations including genetic testing for hereditary cancer susceptibility and HPV vaccination. Dr. Vadaparampil has successfully obtained grants from both the NIH and the ACS to support her research program. She currently leads an NCI-funded study to examine physician, systems, and policy level factors influencing recommendation of HPV vaccination among a national sample of physicians from three primary care specialties. She recently completed a longitudinal study funded by the ACS to examine the psychosocial impact of genetic testing on recently diagnosed breast cancer patients. Due to a long-standing interest in health disparities, Dr. Vadaparampil also leads and collaborates on several projects to reduce disparities across the cancer prevention and control continuum.

Dudith Pierre-Victor, MPH

*Robert Stempel College of Public Health
Florida International University, Miami, Florida*

Dudith Pierre-Victor is a young investigator and PhD candidate at Florida International University. Her research areas focuses are gynecologic, prostate, and HPV related cancers.

Presentation Summaries

A systematic review examining change in risky sexual behaviors after HPV vaccination among adolescent and adult females by Dr. Madhivanan

Dr. Madhivanan provided an overview of the current situation of HPV vaccination in women in the US. HPV vaccine acceptability in the U.S. and other parts of the world showed that a higher intention-to-vaccinate among women was associated with a perceived elevated risk for HPV infection and cervical cancer, believed that HPV infection could be severe, that the HPV vaccine was efficacious, and when vaccination was recommended by a pediatrician. Whereas, the main obstacles for vaccination were concerns about costs and safety. However, for some perception that vaccination could promote increased sexual activity was a big concern. The culmination of a systematic review, conducted by **Dr. Madhivanan**, was that there were no statistically significant differences between more than half a million vaccinated and unvaccinated women when compared across various health outcomes.

Interventions to disseminate the HPV vaccine to adolescent and pediatric populations experiencing health disparities in rural areas were addressed by **Dr. Tami Thomas**. According to the Centers for Disease Control and Prevention (CDC), 4 out of 10 girls and 6 out of 10 boys are unvaccinated in the U.S. Interestingly, although the HPV vaccine originally targeted for girls, empirical data suggests that more college student health services are treated with HPV.

HPV vaccination: beyond behavioral theories to the realities of HPV vaccine completion in the United States by Dr. Thomas

Dr. Thomas reviewed data from the Surveillance, Epidemiology, and End Results (SEER) Program. These areas coincide with poor, rural areas populated by people from various racial and ethnic backgrounds (e.g., Whites, Blacks, and Hispanics). Initial work in several Georgia counties brought forth the anomaly that their conservative populations did not believe they had an HPV problem and that the vaccine would serve among people in metropolitan areas such as Atlanta. Additional barriers to HPV vaccination came from healthcare workers and religious leaders. Miscommunication from healthcare workers to parents about the vaccine was common in underserved rural areas.

The most effective strategies for penetrating the community in **Dr. Thomas'** research were:

1. Meeting with community leaders (e.g., pastors and teachers) in informal environments (e.g., diners) to educate them about the importance of HPV vaccination
2. Discuss the logistical planning of offering, subsidizing, and administering it to community at large at events such as health fairs.

The importance of high quality provider recommendation to facilitate adoption of HPV vaccinations in the United States by D. Vadaparampil

Dr. Vadaparampil reviewed the recommendations to facilitate adoption of HPV vaccination in the U.S. One of the Healthy People 2020 goals is to increase the vaccination coverage for a complete series of HPV vaccine for children between the ages of 13 and 15 years to at least 80%. Despite these recommendations, the findings are that:

1. The HPV vaccination completion rates for adolescents aged 13 to 17 years in the U.S. were under 40% as of 2014.
2. HPV vaccine adoption in the U.S. lags behind other adolescent vaccinations.
3. Missed opportunities of delivering HPV vaccines at the time other vaccines are administered
4. Physician recommendation as key to dissemination of HPV vaccination proven by an increase in vaccination when recommended by a physician.
5. Mandates for other vaccines that kids receive have resulted in successful coverage rates.

Elements of an effective recommendation include timeliness (i.e., recommend at ages 11-12), consistency (i.e., recommend to all age-eligible patients), strength of recommendation (i.e., saying vaccine is very important), and urgency (i.e., same day vaccination). In a study investigating HPV physician recommendation immunization in males (HPV PRIME), **Dr. Vadaparampil** surveyed a random sample of approximately 800 primary care physicians selected from the American Medical Association's Physician Masterfile in 2014. Half of the sample responded, only 69% indicated that the HPV vaccine was currently administered to males in their clinical setting. Overwhelmingly, high quality recommendation was lacking in the sample. Only 35% always recommend the vaccine to 11-12 year olds whereas 35%-42% always recommend across all ages. Nearly 50% present the vaccine as option; and there are missed opportunities to discuss HPV vaccine at many types of visits. Less than half (42%) of respondents do not provide educational materials, but CDC was the most preferred source for these materials. Fact sheets were the most preferred format. More than 50% of physicians said someone else discusses and recommends HPV vaccination (nearly 1/3 of the time this was a nurse practitioner), and the most commonly preferred approaches for training other members of their health care team were written materials and web based training.

Strategies to improve HPV vaccination coverage include:

1. Strengthening provider commitment; mobilizing partners and stakeholders (e.g., Kathy Castor, Representative for Florida's 14th congressional district, is a strong proponent of HPV vaccination);
2. Increasing public awareness (e.g., webinars, media, and awareness events); supporting state immunization program efforts.
3. Systems approaches to improve coverage (e.g., Cervical Cancer Free Florida, Florida's 2016 HPV Summit, NCI Environmental Scans, Partnership to Immunize Teens and Children against HPV).

HPV Vaccination Policies in the U.S. Southern Black Belt by Ms. Pierre-Victor

Ms. Pierre-Victor presented the HPV vaccination policies in the U.S. southern Black belt:

1. High rates of cervical cancer and the lowest HPV vaccination rates among 13-17 year-old females found mainly in the southern and southeastern regions of the U.S.
2. Girls residing in the state of Virginia showed 2.87 times as likely to be vaccinated against HPV compared to those in Tennessee after a mandatory HPV vaccine policy that required vaccination for girls entering sixth grade.
3. Several states have considered adopting Virginia's HPV vaccine mandate, but the literature supporting its effectiveness is scarce.
4. Physician recommendation was an independent predictor of HPV vaccine uptake (2008-2012 National Immunization Survey data of adolescent girls aged 13-17; N=2,110).

5. Adolescent females whose mothers had high school educations were more likely to be vaccinated.
6. Those living below poverty level were more likely to be vaccinated
7. Living in large fringe metropolitan and noncore areas were less likely to be vaccinated.
8. HPV vaccine presented as optional rather than included as a routine part of antenatal care.

Some pediatricians are linking HPV vaccination to annual visits, which extends series completion from the recommended six months to three years. Administering the HPV vaccine annually is a convenient option for patients and may increase uptake and series completion. There has been interest in fewer doses and alternative dosing schedules of the vaccine.

Closing Remarks and Conclusions

Participants of the HPV workshop identified important opportunities and challenges to improving the effectiveness of HPV vaccination. An overview of how HPV vaccination addressed social and demographic differences between vaccinated and unvaccinated women, the current HPV vaccination completion rates for female and male adolescents aged 13 to 17 years in the U.S., the role of the provider in improving vaccination rates and provider commitment; the public awareness; and HPV vaccination policies in the U.S.

Despite the public health benefits of the HPV vaccines have demonstrated after decades of laboratory, clinical, and population-based research studies, continuum research in several areas are necessary to increase the impact of HPV vaccination. Confirmation that extended dosing schedules and/or fewer vaccine doses adequately protect against HPV infections would have enormous implications for HPV vaccine coverage programs in both high- and low-resource settings. Improvement on communication to address the anti-vaccine movements and education to minimize miscommunication, in both healthcare workers and the communities about HPV vaccines, could have an increase in vaccination uptake. Linkage of cancer screening to HPV vaccination guidelines and implementation disseminated widely across populations need to be enforced. States should enact laws that include HPV vaccines in routine vaccination schedules, and implement policies that allow pharmacists to administer vaccines to targeted population are needed.

Authors

Carlos Espinal, MD, MPH
Director, Global Health Consortium

Kalai Mathee, PhD
Founding and Associate Director, Global Health Consortium

Lina Bofill MD, MPH
Assistant Director, Global Health Consortium

Alnecia Rumphs MPH
Graduate Student
Florida International University