Strengthening the Effectiveness of National, State, and Local Efforts to Improve HPV Vaccination Coverage in the United States: Recommendations of the National Vaccine Advisory Committee

Approved by the National Vaccine Advisory Committee on June 25, 2018

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Executive Summary

Recognizing the suboptimal Human Papillomavirus (HPV) vaccination rates in the United States, in February 2018, the Assistant Secretary for Health of the U.S. Department of Health and Human Services charged the National Vaccine Advisory Committee (NVAC) with providing recommendations on how to strengthen the effectiveness of national, state, and local efforts to improve HPV vaccination coverage rates. In the same month, the NVAC established the HPV Vaccination Implementation Working Group and assigned it to develop these recommendations. The working group sought advice from federal and non-federal partners. This NVAC report recommends ways to improve HPV vaccination coverage rates by focusing on four areas of activity: (1) identifying additional national partners, (2) guiding coalition-building for states, (3) engaging integrated health care delivery networks, and (4) addressing provider needs in rural areas.

Acronyms

ACIP – Advisory Committee on Immunization Practices
ACS – American Cancer Society
AFIX – Assessment, Feedback, Incentives, and eXchange
ASH – Assistant Secretary for Health
CDC – Centers for Disease Control and Prevention
CMS – Centers for Medicaid and Medicare Service
EHR – Electronic Health Record
HHS – U.S. Department of Health and Human Services
HPV – Human Papillomavirus
HRSA – Health Resources and Services Administration
IDN – Integrated delivery network
IHS – Indian Health Service
IIS – Immunization information system
IISAR – Immunization Information Systems Annual Report
MenACWY – Meningococcal conjugate
NCQA – National Committee for Quality Assurance
NHIS – National Health Interview Survey
NIS – National Immunization Survey
NVAC – National Vaccine Advisory Committee
ONC – Office of the National Coordinator for Health Information Technology
PCP – President's Cancer Panel
Tdap – Tetanus-diphtheria-acellular pertussis

Introduction

In June 2015, the National Vaccine Advisory Committee (NVAC) issued a report entitled: "Overcoming Barriers to Low HPV Vaccine Uptake in the United States: Recommendations from the National Vaccine Advisory Committee."[1] The report provided recommendations to the Assistant Secretary for Health (ASH) on strategies to increase Human Papillomavirus (HPV) vaccine uptake in young adolescents by reviewing the current state of HPV immunization, exploring the root causes for low vaccine uptake in both initiation and series completion, and identifying some of the best practices currently in use to attain high immunization coverage. Among other recommendations, the NVAC endorsed the recommendations of a report issued by the President's Cancer Panel (PCP), a federal advisory committee of the National Institutes of Health's National Cancer Institute, "Accelerating HPV Vaccine Uptake: Urgency for Action to Prevent Cancer."[2]

Since the 2015 report, a range of policy and program changes and advances in research have resulted in progress on HPV vaccination.[1] In 2016, the Advisory Committee on Immunization Practices (ACIP) updated its HPV vaccination guidance to routinely recommend a 2-dose schedule for males and females aged 9 to 14, while maintaining a 3-dose schedule for those aged 15 and older.[3] Shortly thereafter, two existing Healthcare Effectiveness Data and Information Set (HEDIS®) measures that assessed the receipt of adolescent vaccines were modified and combined. Specifically, in 2017, the Human Papillomavirus for Female Adolescents measure and the Immunizations for Adolescents measure were combined to report receipt of all recommended vaccines (meningococcal, tetanus-diphtheria-acellular pertussis (Tdap), and HPV) for both male and female adolescents.[2,4,5] The 2-dose schedule and updated HEDIS® measure may increase vaccine uptake among adolescents.

Primary care providers deliver most vaccinations in practice-based settings in the United States, but there is a considerable amount of state-to-state and within-state variability.[6] Since the 2015 NVAC report, successful ways of improving HPV vaccination coverage have included more effective provider communication and education, systems-level operational changes in clinical practice settings, and the use of multidisciplinary approaches.[7, 8] A recent publication, "Raising Human Papillomavirus Vaccination Rates,"[9] offers ways to improve HPV vaccination coverage by addressing well-established gaps and implementing proven interventions at scale to optimize HPV vaccination.

HPV vaccine uptake has been relatively slow over the first 10 years of the U.S. HPV vaccination program. Despite the availability of safe and effective HPV vaccines,[10] an updated HEDIS® measure used by more than 90% of America's health plans,[11] and a public health commitment to support the ACIP-recommendation, HPV vaccination coverage remains lower than for other vaccines recommended for the same age group. The 2016 HPV vaccination coverage rate for males (31.5%) and females (43%) did not reach the Healthy People 2020 (HP2020) target of 80% for 13-15 year-olds[12] and lags behind Tdap and meningococcal conjugate (MenACWY)

vaccines by 22% and 28% respectively.[13] While HPV vaccination initiation rates (i.e., receipt of the first dose of the HPV vaccine series) among teens increased from 56.1% in 2014-2015 to 60.4% in 2015-2016, overall only 43.4% (49.5% of females; 37.5% of males) in 2015-2016 completed the vaccination series.[14] The low completion rate warrants increased attention. According to the 2016 National Immunization Survey (NIS), [13] several gender, ethnic, and socioeconomic disparities exist:

- Lower HPV vaccination coverage among males (58.6%) aged 17 years compared to females (72.7%);
- Lower coverage among non-Hispanic white adolescents (54.7%) compared to Hispanic (69.8%) and non-Hispanic black adolescents (65.9%);
- Lower coverage among adolescents living at or above the federal poverty level (57.3%) compared to those living below the federal poverty level (70.2%); and
- Lower coverage among those living in rural (50.4%) compared to urban settings (65.9%).

The cause of low HPV vaccination rates is multifactorial. Because HPV is a vaccine that prevents infections that cause cancer, the uptake of other cancer preventive services offers helpful context. People have differing perspectives on risks and benefits. Data from the 2015 National Health Information Survey (NHIS) showed that only 83% of women reported being up to date with cervical cancer screening, well below the HP2020 target of 93%.[15]

Low HPV vaccination coverage is often attributed to four other main causes. First, many adolescents do not regularly visit their primary care provider for preventive care and thus present no opportunity for vaccination. During 2014, nearly half of adolescents did not attend a primary care appointment and only one-third had a preventive visit.[16] Second, many parents refuse HPV vaccination for their children.[17,18] Third, some research suggests that providers are not giving strong recommendations for HPV vaccine compared to other adolescent vaccines.[19] Fourth, a lack of HPV vaccination mandates may contribute to low HPV vaccine uptake; only three states require HPV immunization for school entry.

Charge to the National Vaccine Advisory Committee

In February 2018, the ASH charged the NVAC with establishing a working group to produce a brief report by June 2018 on recommendations to "strengthen the effectiveness of national, state, and local efforts to improve HPV vaccination coverage rates." The ASH specifically requested the NVAC to consider the following:

1. Many national organizations are currently supporting HPV vaccination efforts. Are there additional national organizations that might contribute to increasing HPV vaccination coverage?
2. At the state level, many states have formed coalitions to support HPV vaccination efforts. Is there general guidance for states that do not yet have coalitions?

3. Integrated health care delivery networks can successfully integrate comprehensive quality improvement approaches to increase vaccination coverage rates. How can state immunization programs and coalitions engage with health systems to work together on improving HPV vaccination coverage?
4. Please specify recommendations on how to meet the needs of providers in rural areas.

The NVAC established the HPV Vaccination Implementation Working Group in February 2018 and asked the group to engage with a wide-range of federal and non-federal partners from government, industry, health systems, associations, academia, and non-profits to inform the development of these recommendations. The working group began with a review of the 2015 NVAC HPV report[1] and focused on recommendations 3 and 4 (Table 1) which were particularly relevant to the current charge, and noted that recommendations 1, 2, and 5 had been partially or fully addressed.

NVAC Recommendations

Focus Area 1: Many national organizations are currently supporting HPV vaccination efforts. Are there additional, national organizations that might contribute to increasing HPV vaccination coverage?

The American Cancer Society (ACS) and the Centers for Disease Control and Prevention (CDC) established the National HPV Vaccination Roundtable (Roundtable) in 2014. The Roundtable is a national coalition of public, private, and volunteer organizations and individuals dedicated to reducing HPV cancers in the United States through coordinated leadership and strategic planning. The Roundtable seeks to improve how often and how strongly clinicians recommend HPV vaccination to their patients, decrease missed opportunities for HPV vaccine administration, and increase state and national HPV vaccination rates. To achieve these goals, the Roundtable works with traditional and non-traditional stakeholders and develops best practices for dissemination and use.

The Roundtable provides clinical guidance on HPV vaccination that will engage physicians, physician assistants, and nurse practitioners and evidence-based interventions that will engage entire health care teams.[20] Because most oropharyngeal cancers are linked to HPV and these HPV-attributable oropharyngeal cancers are increasing, the dental community (e.g., representatives of the American Dental Association and the American Association of Public Health Dentistry) has recently joined the Roundtable as a key partner in HPV prevention efforts, seeking to educate and refer their patients for HPV vaccination.[21] Long-standing partners in the HPV Roundtable include advocacy groups, professional organizations (e.g. primary care providers, nursing, pharmacy), corporate associations, health care organizations, state-level coalitions and roundtables, policy and research organizations, and local, state and federal agencies that deliver and pay for services (e.g., Indian Health Service, Centers for Medicare and Medicaid, and state Medicaid agencies). The wide range and depth of partners come from both

the immunization and cancer communities. In addition to participating in the HPV Roundtable at the National level, many of these organizations work with their respective state and local chapters and partners to implement HPV initiatives and promote increased usage of HPV vaccine.

The Roundtable has been successful at engaging a broad range of stakeholders to promote HPV vaccination through implementation of clinical guidance and evidence-based interventions. However, the 2015 NVAC HPV report,[1] through recommendation 3 (Table 1), recognized the continued need to develop evidence-based, effective, coordinated communication strategies to increase how consistently and how strongly clinicians recommend HPV vaccination to their patients. The NVAC recognizes the need for additional efforts and offers the following recommendations:

Recommendations for Focus Area 1

1.1 To promote inclusion of new health care partners, the ASH should encourage further development, dissemination, and implementation of evidence-based practitioner resources and support collaborative relationships.

1.2 The ASH should encourage enhanced engagement with payers, employers, and quality improvement organizations to increase communication to beneficiaries about HPV vaccine coverage and the importance of receiving the full HPV vaccination series.

1.3 The ASH should encourage employers and payers to link value-based payment to provider benchmarks for HPV vaccination.

1.4 The ASH should encourage the Health Resources and Services Administration (HRSA) to include an HPV vaccination adolescent measure in the Uniform Data System, which serves as a reporting requirement for HRSA grantees in community health centers, migrant health centers, health centers for homeless grantees, and public housing primary care organizations. The data should be used to improve health center performance and operation and to identify trends over time.

Focus Area 2: At the state level, many states have formed coalitions to support HPV vaccination efforts. Is there general guidance for states that do not yet have coalitions?

States decide how to best allocate resources for their specific immunization priorities. Coalitions, which bring together private and public partners, can help catalyze action around immunization priorities. The HPV Roundtable has developed the "State Coalitions and Roundtable Guide"[22] to help states establish these coalitions. The guide provides information for states seeking to improve: 1) their coalitions' engagement and management; 2) HPV vaccination coverage and HPV-related cancer data collection and use; 3) evidence-based interventions; 4) policies related to HPV vaccination; 5) partner networks and other stakeholder engagement tools; 6) education tools for providers, parents, and state and local health departments; and 7) messaging for targeted audiences. The NVAC supports the use of these resources as general guidance to states, while recognizing that not all states may be able to or wish to establish a coalition.

The NVAC recognizes that the strength and effectiveness of coalitions will vary. In some jurisdictions, immunization advocates may take the lead on promoting HPV immunization. In other jurisdictions, the cancer prevention community may be the natural lead. Information and data exchange between these two communities should remain a central activity within coalitions to ensure coherent messaging and share resources. The NVAC offers the following recommendations for additional efforts:

Recommendations for Focus Area 2:

2.1 The ASH should engage with and encourage State Health Officials to use existing, publicly available resources for coalition building and partner coordination, including the National HPV Vaccination Roundtable's "State Coalitions and Roundtable Guide."

2.2 The ASH should encourage continued collaboration and active engagement between immunization and cancer advocacy groups to increase the availability of resources for HPV immunization.

Focus Area 3: Integrated health care delivery networks can successfully integrate comprehensive quality improvement approaches to increase vaccination coverage rates. How can state immunization programs and coalitions engage with health systems to work together on improving HPV vaccination coverage?

Health systems and integrated delivery networks (IDNs) play a unique role in their ability to track patients, invest in health information technology, and incorporate population health approaches and preventive strategies. Increased attention to population health and wellness can help manage the quality and the cost of care delivered to patients. Health systems and IDNs should support ACIP recommendations, including those for HPV vaccination, and should include accountability measures for HPV vaccination and other ACIP-recommended vaccines in strategic and operational plans, such as reporting requirements to HEDIS® and other quality reporting programs.

Improved utilization of immunization information systems (IISs) by health systems and health delivery networks offers a significant, but underutilized, opportunity to improve HPV vaccination uptake. CDC's 2016 IIS Annual Report, which assesses the 64 CDC-funded immunization program grantees across the United States,[23] found that 28.3% of females and 21.8% of males aged 13-17 received at least three doses of HPV in 2016. In comparison, the NIS[13] reported that 43% of females and 31.5% of males received three doses of HPV vaccine. These disparities suggest underreporting of HPV vaccination to state IISs.

The 2015 NVAC HPV report,[1] through recommendations 4.1 and 4.1.2 (Table 1), emphasized the importance of addressing barriers to vaccination in non-traditional venues by strengthening the ability of IISs to view, query, and submit immunization records from a range of venues. While all IISs accept HPV immunization information, some federal agencies, including the Department of Defense (DoD) and Department of Veterans Affairs (VA), are not required to participate in meaningful use of certified electronic health record technology and therefore are

not incentivized to share immunization data with state IISs.[24] The NVAC makes the following recommendations:

Recommendations for Focus Area 3:

3.1 The ASH should work with State Health Officials and local health departments as key immunization leaders to engage with regional and local health systems and integrated delivery network (IDN) executives to prioritize HPV vaccination as an effective means for cancer prevention and to develop accountability mechanisms to track and incentivize performance.

3.2 The ASH should engage the Office of the National Coordinator for Health Information Technology (ONC), State Health Officials, and partners to support interoperability by encouraging bi-directional electronic data exchange and broad use of immunization data across electronic health records (EHRs), immunization information systems (IISs), and with all federal partners, particularly as it relates to HPV immunization. Activities may include:

3.2.1 Supporting the onboarding process of new users (i.e. getting a provider organization ready to send, submit, and query patient data from an EHR to the IIS), including adult providers.

3.2.2 Developing a memorandum of understanding or data use agreement between the Department of Defense (DoD), Department of Veteran Affairs (VA), and immunization information systems (IISs) to support immunization data exchange.

3.2.3 Supporting the acceleration of current EHR, pharmacy information systems, and IIS standardization efforts, including promoting functionality that supports query and response for clinical decision support.

3.3 The ASH should work with State Health Officials, local health departments, and their partners to encourage the use of IISs and EHRs to:

3.3.1 Generate coverage assessments for a provider's population for use in targeting reminder efforts for adolescents that are due and past due for HPV vaccination.

3.3.2 Assess opportunities to vaccinate individuals within a provider's practice to reduce missed opportunities to vaccinate and increase protection for populations (e.g., through the use of clinical decision support and quality improvement processes such as Assessment, Feedback, Incentives, and eXchange (AFIX)).

Focus Area 4: Please specify recommendations on how to meet the needs of providers in rural areas.

Rural health care providers and communities face many of the same challenges as other communities, including increasing health care costs, overextended health care infrastructure, and lower HPV vaccination coverage rates relative to other adolescent vaccines. However, the percentage of adolescents living outside of urban areas who have received the first dose of the HPV vaccine series remains 16% lower than for adolescents who live in urban areas.[13] Critical shortages of primary care providers may partially account for the lower HPV vaccination rate in rural communities.[25, 26, 13] Rural communities may face special challenges in raising HPV vaccination rates, such as 1) less access to vaccine supply, particularly HPV vaccine; 2) limited

resources for communication to patients and the community; 3) less access to cancer experts, vaccination sites, and pharmacies; and 4) less community-based vaccine and immunization education for providers. To investigate and improve HPV vaccine uptake, some rural communities may be able to leverage the expertise and resources of pediatric clinical trial networks and telemedicine services.[27, 28] Local problems often can be solved with local solutions using available resources, and rural communities can share best practices with other rural communities. NVAC recommends the following:

Recommendations for Focus Area 4:

4.1 The ASH should request further research be conducted to better understand the needs of rural providers in supporting the administration of or referral to vaccination services in rural environments and to identify and determine barriers to accessing vaccination services for patients in rural settings.

4.2 The ASH should encourage the increased use of technology-based, telemedicine systems such as tele-consulting and tele-mentoring partnerships to reach rural and underserved communities to strengthen provider education on HPV vaccination and cancer prevention.

4.3 The ASH should support a stronger HHS-wide social media presence to improve the reach of communication strategies and directly engage parents and adolescents to build trust and recognition about the importance of HPV vaccination and how to best engage patients in rural communities.

Implications for Future Consideration

Improving complete HPV vaccine coverage will require effective partnerships and consistent messaging to patients, parents, providers, and the community. The Roundtable's activities demonstrate that a focus on HPV vaccination as cancer prevention provides an effective message for garnering public support. Consistent messages from national organizations and a stronger social media presence can improve communication strategies and directly engage parents and adolescents. Future HPV vaccination messaging should address the concerns of parents, who serve as the primary decision-makers regarding adolescent vaccination.

Although substantial progress has been made to improve HPV vaccination coverage rates since the 2015 NVAC HPV report[1], several recommendations still emerge as priorities. Much work remains to optimize health systems to improve vaccination coverage, particularly in underserved subpopulations, and to develop more effective communication strategies for distinct populations and communities. Further progress requires additional investment to address remaining gaps and disparities in HPV vaccination coverage.

Table

Table 1: Strategies for Overcoming Barriers to Human Papillomavirus Vaccine (HPV) Uptake

"Overcoming Barriers to Low HPV Vaccine Uptake in the United States: Recommendations from the National Vaccine Advisory Committee"[1]

Recommendation 1: The ASH should endorse the PCP report, *Accelerating HPV Vaccine Uptake: Urgency for Action to Prevent Cancer,* and adopt the recommendations outline therein.

Recommendation 2: As the PCP recommended, NVAC should monitor "the status of uptake and implementation of the recommendations." This should be done by hearing an annual progress report from HPV vaccination stakeholders identified in the PCP report.

Recommendation 3: The ASH should work with relevant agencies and stakeholders to develop evidence-based, effective, coordinated communication strategies to increase the strength and consistency of clinician recommendations for HPV vaccination to adolescents (both males and females) in the recommended age groups and to improve acceptance among parents/guardians, adolescents, and young adults.

Recommendation 3.1. Develop practical tools to increase clinicians' skills and confidence in promoting HPV vaccination as a routine adolescent vaccine and part of routine adolescent care. These communication tools should equip clinicians to emphasize HPV vaccine as a cancer prevention strategy, to increase clinicians' ability to respond to questions from parents/guardians and adolescents about HPV as a sexually transmitted infection, and to enable clinicians to effectively address parental hesitancy.

Recommendation 3.2. Develop evidence-based, culturally competent communication strategies for parents/guardians, adolescents, and young adults that address key beliefs driving decisions to vaccinate and address barriers to vaccination.

Recommendation 3.3. Promote collaboration among all stakeholders to coordinate communications and messaging that increase message consistency across professional organizations and their constituencies.

Recommendation 3.4. Utilize multiple methods for communication, including one-on-one counseling, public health messaging, social media, and decision support systems.

Recommendation 3.5. Promote science-based media coverage about HPV vaccination and appropriate response to media coverage that does not adequately reflect the science of HPV vaccines and HPV vaccination recommendations.

Recommendation 4: NVAC recommends the ASH should work with the relevant agencies and stakeholders to strengthen the immunization system in order to maximize access to and support of adolescent vaccinations, including HPV vaccines.

Recommendation 4.1. Addressing barriers to vaccination in venues outside the traditional primary care provider office, including pharmacies, schools, and public health departments. This may include immunization status assessment and administration of the appropriate doses toward completion of the HPV vaccination series."

Recommendation 4.1.1. Develop strategies to overcome barriers regarding reimbursement for vaccination administration and compensation of vaccine administrators and their staff.

Recommendation 4.1.2. Strengthen immunization information systems (IISs) to allow pharmacies, school-located programs, and public health clinics to view and query patient immunization records and submit records of immunizations administered to their state IIS, which ensures proper communication and record of immunization histories are available to the patient's primary care provider, vaccination administrator, and the state public health system.

Recommendation 4.1.3. Encourage collaboration and sharing of best practices for successful vaccination programs at pharmacies, schools, and public health clinics.

Recommendation 4.2. Working with relevant agencies and stakeholders to increase the widespread use of quality improvement strategies, such as Assessment, Feedback, Incentives, and eXchange (AFIX) visits, to support and evaluate HPV immunization practices within all vaccination venues.

Recommendation 4.3. Encouraging widespread adoption of state-centralized reminder recall for adolescent vaccines and reporting of vaccinations into existing immunization information systems and electronic health records.

Recommendation 5: The ASH should encourage the review or development of available data that could lead to a simplified HPV vaccination schedule. In addition to a review that could impact existing vaccines, manufacturers of HPV vaccines in development should also consider opportunities to support the simplest HPV immunization schedule while maintaining vaccine effectiveness, safety, and long-term protection.

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