COMMENTARY

Current initiatives to protect Rhode Island adolescents through increasing HPV vaccination

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ABSTRACT

This commentary provides an overview of recent initiatives in Rhode Island to promote human papillomavirus (HPV) vaccination with the goal of protecting Rhode Island adolescents against vaccine-preventable HPV-associated cancers. With the exception of the introduction of a recent school entry requirement, most of the initiatives and related activities described were conducted as part of a cooperative agreement between RIDOH and CDC, and were supported by the Prevention and Public Health Fund.¹

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Introduction

Rhode Island is the smallest state (1,214 square miles) in the nation with slightly more than 1 million residents. There are no local health departments in Rhode Island, making the Rhode Island Department of Health (RIDOH) the sole public health authority responsible for the provision of core public health activities in the state. In absence of local health authorities, the Department works in partnership with primary care providers, pharmacies and community-based organizations to ensure that all Rhode Islanders have access to vaccines. Vaccine policy is guided by the Rhode Island Vaccine Advisory Committee. Committee members are charged with providing recommendations to the Director of RIDOH on issues of vaccine policy, vaccine provision, and immunization-related activities for the control of vaccine-preventable disease in Rhode Island. Rhode Island vaccine policy is also informed and guided by national immunization policy; the Centers for Disease Control and Prevention (CDC) sets national immunization schedules based on recommendation of the Advisory Committee on Immunization Practices (ACIP).²

Background

Immunization infrastructure in Rhode Island

Rhode Island is a “universal purchase” vaccine state³; to ensure access to vaccination by all children in Rhode Island, federal and other funding sources are used to provide vaccines to all children regardless of insurance status. All childhood and adolescent vaccines, and most adult vaccines, recommended by the ACIP are purchased by RIDOH from the CDC federal contract at a reduced price and distributed to immunization providers

at no cost to the providers. Federal and private insurer funding covers the cost of vaccine purchased. Eliminating the financial burdens of providers purchasing their own vaccine supply reduces barriers and improves equal access to all vaccines. Rhode Island maintains a robust childhood immunization information system (IIS; also known as the “KIDSNET registry”) for children up to 19 y of age and is working to expand the registry to include adults over the next few years.

HPV vaccines have been provided through the state program for females since November 2006 and for males since July 2011. HPV vaccination is accessible through primary care providers and through Rhode Island’s *Vaccinate before You Graduate* (VBYG) program, a school-based vaccination program.⁴

School immunization requirements

Rhode Island General Law gives RIDOH the authority to establish immunization requirements through public regulation (R.I.G.L. § 16-38-2, R.I.G.L. § 23-1-18). Immunization regulations include school entry vaccine requirements and the provision for a medical or religious exemption. Rhode Island law does not have a provision for a philosophical or ideological exemption. Schools are required to complete a web-based annual immunization report which is used to monitor vaccination coverage rates in schools.

Initiatives

Adding HPV vaccination to school-entry requirements

In Rhode Island, vaccines that are routinely recommended for children are typically considered for inclusion in school-entry

requirements 3 to 4 y after they have been added to CDC's annual national immunization schedule for children and adolescents.⁵ Before adding a recommended vaccine to state regulations, RIDOH considers vaccine-specific safety data, supply, health insurance coverage, as well as provider and public support. In October 2013, Rhode Island's Vaccine Advisory Committee voted to recommend a graduated integration of HPV vaccination as a school requirement over 3 y beginning in 2015 and to develop a public health educational campaign on the importance of HPV vaccination. The proposed graduated approach entailed that, for fall 2015, one HPV vaccine dose would be required for entry into 7th grade. For fall 2016, 1 dose will be required for 7th grade entry and 2 doses will be required for 8th grade entry. For fall 2017 and thereafter, one dose will be required for 7th grade entry, 2 doses will be required for 8th grade entry, and 3 doses will be required for 9th grade entry.⁶ This graduated approach was intended to ensure progress in protecting adolescents against HPV-associated disease, while also striving to make certain that the immediate logistical and administrative burden of compliance was manageable for school nurses, parents, students, and providers; however, the school-entry requirement implementation schedule was not meant to supersede the ACIP-recommended schedule for HPV vaccination. As required with any change to state regulations, a public hearing was scheduled and held in January 2014. There was minimal opposition presented at the public hearing, and in July 2014, the regulations were passed with an effective date of August 1, 2015.

Using our data for action and assessment: HPV vaccination coverage rates

Rhode Island relies on several data sources to monitor vaccination coverage rates. These data are shared with immunization providers and other stakeholders to inform and motivate changes in practice and policy. Available data include CDC's National Immunization Survey and annual school immunization report as well as the KIDSNET data. The KIDSNET data are used to monitor immunization coverage rates in immunization provider practices through CDC's Assessment, Feedback, Incentive, and eXchange (AFIX) programmatic initiative.⁷

According to the 2014 National Immunization Survey-Teen, Rhode Island has led the nation's states in HPV vaccination coverage rates among adolescents, aged 13–17 y⁸; however, rates have plateaued in recent years. Since 2010, HPV vaccination coverage estimates for receipt of ≥ 3 HPV vaccine doses for Rhode Island females aged 13–17 y have been above 50%, ranging from 53.7–57.7%^{8,9,10,11,12} (mean: 56%). Estimates for receipt of ≥ 3 HPV vaccine doses for Rhode Island males of the same age group have only increased from 18% in 2012 to 43% in 2013 and 2014.^{8,9,10} Progress is needed to achieve Healthy People 2020 immunization targets of 80% for receipt, by ages 13–15 y, of ≥ 3 doses of HPV vaccine among females and males, respectively (objectives IID-11.4 and 11.5).¹³

Attaining additional resources and implementing Multi-component interventions

In an effort to increase stagnating HPV coverage rates, Rhode Island applied for and received a Prevention and Public Health Fund¹ (PPHF) cooperative agreement award with CDC.¹⁴ As

one of 22 PPHF HPV Immunization awardees, RIDOH has conducted activities in 5 specified areas. These areas include:

- Developing a jurisdiction-wide joint initiative with immunization stakeholders
- Implementing a comprehensive communication campaign targeted to the public
- Implementing Immunization Information System (IIS)-based reminder / recall for adolescents aged 11–18 y
- Using assessment and feedback to evaluate and improve the performance of immunization providers in administering the 3-dose HPV vaccine series consistent with current ACIP recommendations
- Implementing strategies targeted to immunization providers to:
 - Increase knowledge regarding HPV-related diseases (including cancers);
 - Increase knowledge regarding HPV vaccination safety and effectiveness;
 - Improve skills needed to deliver strong, effective HPV vaccination recommendations;
 - Decrease missed opportunities for timely HPV vaccination and series completion;
 - Increase administration of HPV vaccine doses consistent with current ACIP recommendations.

Selected activities conducted by Rhode Island with funding from this award will be highlighted below.

Working with Immunization Providers

In 2006, the ACIP recommended routine HPV vaccination for female adolescents 11–12 y of age, and the recommendation was expanded to include adolescent males in 2011.¹⁵ To assist with increasing immunization coverage rates and to identify and reduce missed vaccination opportunities, state immunization programs and other public health jurisdictions utilize CDC's quality-improvement program known as AFIX.⁷ The AFIX initiatives also provide tools and strategies to improve the standards of immunization practices at provider offices. More specifically, consistent with federal guidance, RIDOH's AFIX staff assesses a provider's immunization coverage rates and immunization practices, and gives *feedback* to the provider at a scheduled site visit. *Incentives* for providers include coverage-rate recognition awards and web-based reports that support quality-improvement initiatives. Ongoing *exchange* between the provider and RIDOH AFIX staff determines and facilitates support of necessary quality-improvement strategies for providers. There are 180 pediatric practices in the state, and Rhode Island's goal is to conduct an AFIX site visit at half of the practices each year. [CDC recommends that each federally funded public health jurisdiction (including states) visit 25% of its pediatric practices each year].

A typical RIDOH AFIX site visit is 30 min and includes the practice's vaccine contact, office manager, and any other staff who are able to attend. Ideally, at least 1 physician in the practice should attend a portion of the visit; however, physicians rarely participate in typical RIDOH AFIX visits. During each visit, childhood and adolescent coverage rates are reviewed, successes are acknowledged, and data submission problems to

the IIS are addressed. In addition to sharing a supply of educational materials for use with parents and patients.

RIDOH staff conclude the visits by recommending to practice staff any additional activities, modifications, or interventions needed to achieve increased vaccination coverage rates among practice patients.

Since its receipt in 2014, the PPHF HPV Immunization award funding has supported the development and implementation of an “enhanced AFIX visit.” The goal of the enhanced AFIX visit is to provide AFIX visits consistent with federal program guidance and to add physician-to-physician education with a special focus on HPV disease and vaccination. Since physician recommendation is among the strongest predictors of HPV vaccination among adolescents,¹⁶ RIDOH felt that increasing physician knowledge of and support for HPV vaccination would provide the most tangible results. RIDOH contracted with a board-certified obstetrician/ gynecologist and reproductive endocrinologist to conduct the enhanced AFIX visits. The enhanced AFIX site visits began in February 2015 and will continue through 2016. As of January 2016, 56 enhanced AFIX visits have been conducted.

Using immunization registry data, RIDOH staff generated a list of 50 pediatric practices that had an HPV vaccination coverage rate that was lower than the benchmark of 56% of patients (females and males combined) having ≥ 3 doses of HPV vaccine. These initial 50 practices were then designated to receive enhanced AFIX visits that were designed to offer elements including individualized HPV disease and vaccination education, review of ACIP and Rhode Island recommendations and guidelines, and consultation about any concerns regarding HPV vaccine safety and efficacy.

In an effort to capitalize on the pattern of better outcomes of a physician-to-physician interaction, the contracted physician consultant personally schedules the visits and ensures a commitment ahead of time from one or more practice physicians to attend the visit. In cases where the physician consultant has encountered resistance from administrative staff or could not confirm the attendance and participation of at least one practice physician, the physician consultant reschedules the enhanced AFIX visit and is diligent and persistent in her effort to conduct a physician-to-physician meeting. Due to the level of interest of the practice physician(s), many of the enhanced AFIX visits conducted to date have lasted an average of 45 min, significantly longer than a typical AFIX visit.

An important focus of an RIDOH AFIX site visit is reviewing the practice-specific immunization coverage data. In providing assessment and feedback, the physician consultant does discuss the practice’s childhood and adolescent coverage rates, including HPV vaccination rates; however, during the enhanced AFIX visits, emphasis is placed on addressing providers’ knowledge gaps and dispelling misinformation about HPV vaccination (which quickly became pervasive in the state in 2015 in part due to controversy related to the initial implementation of the HPV vaccination school entry requirement). Physician-to-physician interaction is more personal in nature, so as a practicing gynecologist and reproductive endocrinologist, the physician consultant talks about the impact of HPV-related morbidity in young women that she has witnessed,

including abnormal Pap tests, cervical dysplasias, and impaired fecundity and fertility (e.g., preterm labor, cervical incompetence, and cervical stenosis) as a result of surgical procedures to treat precancerous lesions. The physician consultant presents specific patient cases from her own practice (though identifying information is not disclosed) to inform practice physicians’ consideration of the importance of vaccinating adolescents consistent with ACIP recommendations and improving the quality of their practice patterns in immunization delivery.

From anecdotal experience, some immunization providers have reported that some parents are reluctant to have their child start the HPV vaccine series because of its perceived association with sexual activity. Data showing that there is no evidence that HPV vaccination is associated with initiation of sexual activity¹⁷ are shared and discussed. In addition to her clinical experiences, the physician consultant shares her personal beliefs in HPV vaccination and openly discusses her decision to vaccinate her 2 children, now teenagers. Inability or discomfort in discussing sensitive issues of adolescent sexual health should not be a barrier to HPV vaccination at the ACIP-recommended time. The physician consultant has observed that, during the course of site visits, many physicians develop a level of comfort with open and honest exchange of opinions as well as discussion of challenges and personal experiences with healthcare systems and immunizations. This helps foster receptivity to practice quality improvement changes needed to increase HPV vaccination coverage among adolescents.

Working with schools

Collaboration with school nurse teachers and school administrators is an integral component of Rhode Island’s success with adolescent vaccination efforts. Beginning with the 2015–2016 school year, RIDOH utilized PPHF funding to support school-located HPV vaccination clinics in public middle schools. This campaign is modeled after RIDOH’s nationally-recognized, high school Vaccinate Before You Graduate (VBYG) program,⁴ and aims to offer a convenient and easy way to vaccinate adolescents.

School nurse teachers are the front-line public health advocates in schools. Because the recent HPV immunization regulations were related to school entry, many parents directed questions and concerns to the school nurse teacher at their child’s school. In order to assist the school nurse teachers in responding to inquiries, RIDOH included a panel discussion as the featured item of its biannual School Nurse Teacher Conference. The panel included a local practicing pediatrician, other clinicians, RIDOH Office of Immunization staff, and one of RIDOH’s medical directors, who is also a practicing pediatrician in the state.

Educating and engaging the public

As providers were seeing patients in early spring 2015 and discussing the impending HPV vaccination requirement for 7th grade entry, more and more parents became aware of the requirement, and a small, but vocal, group of HPV immunization requirement opponents emerged. These opponents, with anti-government sentiment, argued that the state was

interfering with parent-child decisions. Some also stated that the state should not require HPV vaccination because, in contrast to the risks associated with contracting other vaccine-preventable pathogens, children are not typically at risk of being infected with HPV while attending school.

In early summer, PPHF award funds were used to launch a multi-faceted public health education campaign about the importance of protecting adolescents against HPV diseases, including cancers. Beginning in June 2015, RIDOH ran ads on television, radio, social media, and in movie theaters before feature presentations. In addition, printed advertisements on the side of public transit buses were placed. As the summer progressed, the anti-HPV vaccination opponents became increasingly aggressive with their own public messaging campaign. In an effort to provide factual information and allow parents to ask questions about HPV disease, HPV vaccination, and the new regulations, RIDOH scheduled several community information sessions at various locations around the state.

A literal interpretation of the new regulation means that any child that does not have the appropriate number of HPV vaccine doses or does not have a completed exemption form on record will be excluded from school. RIDOH worked closely with schools in 2015 to ensure that no children were excluded from schools on the basis of strong parent conviction regarding HPV vaccination. The school regulations, including those for HPV vaccination, are meant to be a safety-net measure for public health and schools to protect the health and well-being of RI children and adolescents.

In mid-2016, PPHF award funds will be used to support a reminder/recall¹⁸ for HPV vaccination to parents and guardians using information contained in KIDSNET, the state's childhood immunization registry. This campaign was initially scheduled to take place in July 2015; however, due to the extensive media attention on the vaccination requirement debate, the reminder/recall campaign was temporarily delayed.

Assessing initiatives' impact

In Rhode Island, evaluation of HPV vaccination rates and of the attitudes of providers and the public is ongoing. Compared with 2014, orders for HPV vaccine doses in 2015 increased from 48,480 to 57,800 (19.2%) (CDC, unpublished data), suggesting that providers are ordering more HPV vaccine doses for administration to their patients. Follow-up studies are necessary to determine if this increase in orders for the vaccine will translate into an actual change in provider vaccination behavior and increases in HPV vaccination coverage. Further analysis is also needed to see if the enhanced AFIX visits result in a measurable change in provider immunization practices and HPV vaccination coverage, recognizing that this intervention was targeted at provider practices with lower baseline HPV vaccination coverage rates compared with other RI immunization providers. AFIX staff will conduct the recommended follow-up visit within 6 months of each enhanced visit to assess change in HPV vaccination coverage rates. In January 2016, a preliminary review of the 2015–16 school immunization data revealed that most Rhode Island 7th grade students were in compliance with the new HPV requirement upon school entry. Data from 99% of schools who report student immunizations show that 73.7%

of seventh graders have received at least 1 dose of the 3-dose HPV vaccine series (RIDOH, unpublished data). From a state-wide perspective, according to KIDSNET immunization registry data, HPV vaccination coverage rates for receipt of ≥ 3 doses among RI adolescents aged 13–17 y increased by approximately 5 percentage points from September 2014 to September 2015 (RIDOH, unpublished data).

Summary and lessons learned

During 2013–present, RIDOH has planned and implemented several initiatives to increase HPV vaccination coverage among Rhode Island adolescents. While the work on the initiatives is ongoing and evolving, available data suggest that efforts might be resulting in increases in HPV vaccine doses ordered and impacting HPV vaccination coverage. Based on our experience to date with these initiatives, specific lessons learned are:

- When considering possible initiatives, it is useful to try to anticipate that an initiative's implementation might impact other aspects of program planning and staffing. In addition, implementing new immunization requirements can have other unintended effects. Engagement and participation of immunization, cancer-prevention, and public health stakeholders can help inform planning as well as addressing any issues or controversies that might arise.
- Using state and local data is valuable to assess and improve vaccination coverage rates, and it helps demonstrate to the public and others that efforts are being effective. Also, sharing individual practice data with providers can assist them in quality improvement efforts.
- A transparent, concise, and well-timed communications plan is critical to successful implementation of initiative(s) to increase HPV vaccination coverage. Accurate and timely information is necessary for providers, provider office staff, school nurse teachers, school administrators, parents, and the public alike.
- Notification of any updates or changes to school immunization regulations needs to be made early and often. Although a public hearing was held to review and receive comment on the proposed regulations and RIDOH scheduled community meetings throughout the state after the regulations passed to inform parents and answer questions, beginning community outreach less than 3 months before the effective date of the new regulation did not allow sufficient time to assure accurate messaging was received by all target audiences. Allowing more time for outreach is recommended. In addition, even more emphasis should be placed on notifying healthcare providers and school nurses first so that, in turn, they can assist in educating parents and are able to answer questions that parents might have. This also helps ensure that providers have sufficient lead time to plan for appropriate vaccine supply.
- When possible, work to assure that school immunization regulations are consistent with ACIP-recommended scheduling of vaccinations. The ACIP recommends that the second HPV vaccine dose be administered at least 1 to 2 months following the first dose, and the third dose at least 6 months after the first dose.¹⁹ The way that the

Rhode Island school vaccination requirements are currently written, some parents and providers think that an adolescent only gets 1 dose of HPV vaccine a year for 3 y. RIDOH continues to advocate for adherence to the ACIP-recommended schedule, and provides education that the school regulations are meant to be a safety-net measure for public health and schools to protect the health and well-being of children and adolescents.

- Enhanced AFIX visits appear to be very effective in engaging immunization providers in improving their HPV vaccination practices. To date, these visits have revealed:
 - All healthcare providers who were visited as of October 2015 were familiar with ACIP's recommended schedule for HPV vaccination, but some were not adhering to the schedule, leaving adolescents unvaccinated and vulnerable to vaccine-preventable HPV infections and cancers.
 - The majority of 56 providers were unaware of the complete burden of HPV infection, including abnormal Pap smears, cervical pre-cancers, and associated pre-cancer interventions.
 - Many providers did not understand the benefits of HPV vaccine for adolescent males and benefited from education about this.
 - Providers frequently questioned the cost-effectiveness of the HPV vaccination requirement and cited patient feedback of reduced public confidence in government regulators, which has been heightened by the anti-government minority opposed to the HPV vaccination requirement. Notably, the economic burden of treatment and prevention of HPV disease prior to HPV vaccination introduction was estimated to be \$8 billion or more in direct annual costs in the United States^{15,20} and cost-effectiveness of HPV vaccination is well-documented.^{15,19}
 - Providers attributed most delays in administration of HPV vaccine to parents' concerns about vaccine safety and the misconception that HPV vaccine might prompt sexual activity. Conversations suggested that, prior to the enhanced AFIX visits, providers did not attempt to correct misinformation in these 2 areas. The enhanced AFIX visits provide an opportunity to help providers build awareness and skill with respect to delivering a strong recommendation for HPV vaccination and also addressing these and any other questions. Because it is recognized that provider counseling and recommendations greatly impact parental acceptance of vaccination, CDC has developed a tip sheet to aid providers in responding to parents' questions, should they have any, and in communicating strong, concise HPV vaccination recommendations.²¹
- Negative or biased information regarding immunization in traditional and social media, respectively, is ongoing and persistent. Reference to a resource for parents and providers that includes information regarding the safety and effectiveness of HPV vaccination²² can be helpful. Such resources can also be useful in patient care settings.

- Series completion remains challenging. Continuing to promote the use of school-located clinics in middle school for administration of second and third doses of the HPV vaccination series will likely help promote HPV vaccination series completion. All practices that received enhanced AFIX visits identified logistical difficulties of assuring patients returned to the office, at the appropriate time, for the second and third HPV vaccine doses, despite the reminders and recalls feature that is a part of most electronic medical record software. The reminder / recall effort planned by RIDOH during 2016 might help with series completion.
- RIDOH needs to continuously emphasize the science behind ACIP's schedule for all vaccines, including those recommended for children and adolescents. During enhanced AFIX visits, several practitioners said they felt uncomfortable giving multiple injections in one visit to adolescent patients and adopted alternate schedules. The goal of the national immunization schedule is to assure that all persons, including children and adolescents, receive protection from vaccine-preventable diseases at optimal times based on demonstrated vaccine safety and effectiveness. Relying on alternate vaccination schedules leaves children, adolescents, and adults at unnecessary risk of vaccine-preventable diseases.

Through several ongoing initiatives to promote timely and complete HPV vaccination, RIDOH is committed to partnering with immunization providers, schools, parents, the public and other stakeholders to protect Rhode Island adolescents against vaccine-preventable HPV-associated diseases, including cancers.

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