



## HPV Vaccination among Female Adolescents in Rhode Island, 2008–2011

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Genital human papillomavirus (HPV) is the most common sexually transmitted disease in the world. In the United States, approximately 20 million people are currently infected with HPV and another 6 million people become newly infected each year.<sup>1,2</sup> In fact, most sexually active adults become infected at some point in their lives, with the highest rates of infection among people in their late teens and early 20s.<sup>1,2</sup> Although most HPV infections are asymptomatic and transient, certain types can cause cervical cancer in women and other types of anogenital cancers and genital warts in both men and women.<sup>1,2</sup> Two vaccines are available to prevent the HPV types that cause most cervical cancers: a bivalent vaccine (Cervarix), and a quadrivalent vaccine (Gardasil). Gardasil also prevents HPV types that cause most genital warts and protects against certain anogenital cancers.<sup>1,2,3</sup> Either HPV vaccine is routinely recommended for females aged 11–12 years. Gardasil is routinely recommended for males aged 11–12 years. Both vaccines are administered as a 3-dose series over 6 months, ideally, before adolescents are exposed to HPV.<sup>1,2,3</sup> The Rhode Island Department of Health currently provides only Gardasil to health care providers who use state-supplied vaccines.

This report describes: 1) the HPV vaccination rates among Rhode Island **female** adolescents 13–17 years of ages during 2008–2011\* and 2) the main reasons for not receiving HPV vaccination for those unvaccinated.

### METHODS

To assess HPV vaccination coverage and identify barriers to vaccination among female adolescents in Rhode Island, we analyzed the 2008–2011 Rhode Island data from the National Immunization Survey-Teen (NIS-Teen). Since 2008, NIS-Teen has collected vaccination information for adolescents aged 13–17 years in all 50 states and selected areas to provide national and state estimates of vaccination coverage. NIS-Teen is a two-stage survey: 1) a random-digit-dialing telephone survey of parents/guardians with adolescents aged 13–17 years to collect vaccination and socio-demographic information on their children, as well as a parent's knowledge

of and attitudes on vaccines (Household Survey), followed by 2) a mail survey of the children's vaccination providers to validate immunization information (Provider Survey). The 2008–2011 NIS-Teen data contain a set of HPV vaccination information, including the number of shots received, reasons for not receiving the vaccine, and whether the child's doctor recommended the vaccine.

For this report, we analyzed the Rhode Island **female** adolescent data from the 2008–2011 NIS-Teen, which includes 1,019 household surveys and 695 provider surveys. The HPV vaccination coverage rates presented in this report were based on the Provider Survey and the parent's knowledge of and attitudes on vaccine were based on the Household Survey. Both household and provider sample data were weighted to represent the entire female adolescent population in Rhode Island. The NIS-Teen methodology, including weighting procedures, is described on the Centers for Disease Control and Prevention (CDC) website.<sup>4</sup>

### RESULTS

#### HPV Vaccination Coverage and Series Completion

The HPV vaccination coverage with  $\geq 1$  dose among Rhode Island female adolescents increased significantly from 54.7% in 2008 to 76.1% in 2011 ( $p < .001$ ). The coverage with  $\geq 3$  doses also increased significantly from 31.4% in 2008 to 56.8% in 2011 ( $p < .001$ ). Both  $\geq 1$  dose coverage and  $\geq 3$  dose coverage in Rhode Island were much higher than the national female coverage rates (Figure 1).

In 2011, the 3-dose series completion rate for Rhode Island female adolescents was 80.5% compared to 70.7% nationally. The series completion rate measures the proportion of females who received three doses among those who had at least one HPV dose and at least 24 weeks between the first dose and the interview date. The HPV vaccination coverage and the series completion information were based on the provider's report of vaccination history from the adolescent's medical record.

#### Parental Reasons for Not Vaccinating Against HPV

The parents/guardians of female adolescents who did not receive the full 3 doses of HPV vaccine and were reported to be unlikely to receive HPV shots in the next 12 months were asked to provide the main reasons for not vaccinating (multiple responses were allowed). Reasons reported include:

\*While the HPV vaccination has been routinely recommended for female adolescents since 2006, it has been routinely recommended for male adolescents since 2011. We only used female data for this report since the state level data for male adolescents is not available for 2008–2010.

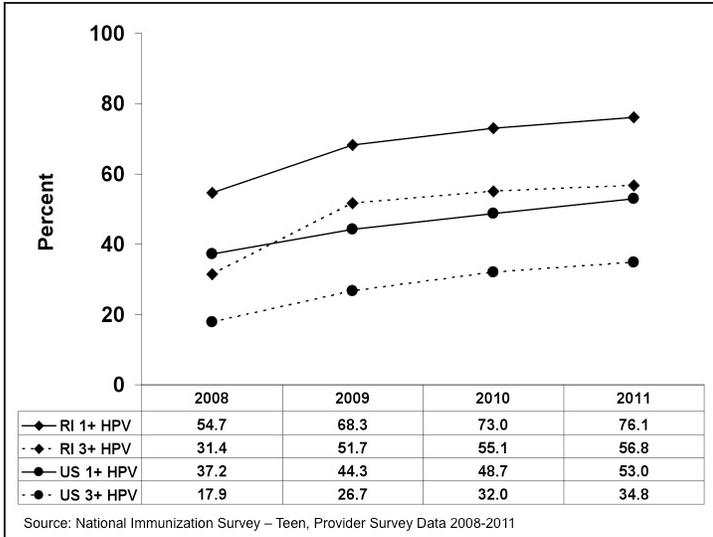


Figure 1. Trends of HPV vaccination coverage rates among females 13–17 years of age, Rhode Island and the United States, 2008–2011.

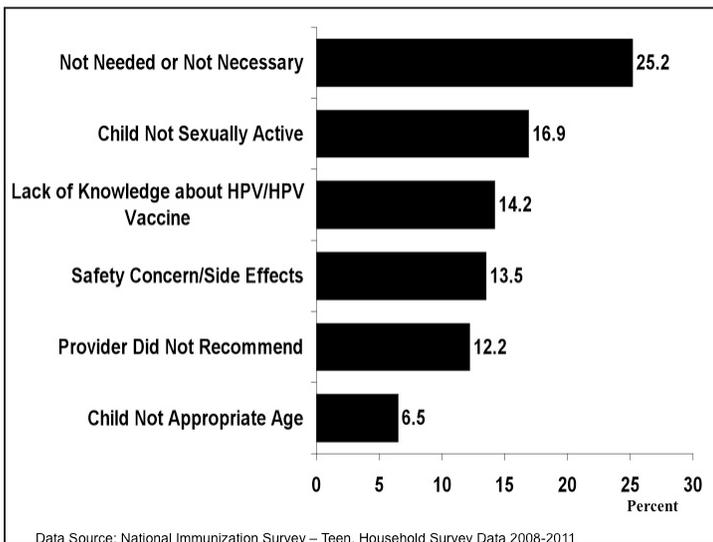


Figure 2. Parental reasons for not vaccinating against HPV, Rhode Island, 2008-2011 Combined.

not needed or not necessary (25.2%), child not sexually active (16.9%), lack of knowledge about HPV or HPV vaccine (14.2%), safety concern/side effects (13.5%), provider did not recommend (12.2%) and child not at appropriate age (6.5%) (Figure 2).

#### Provider's Recommendations for HPV Vaccination

The provider's recommendation for HPV vaccination was significantly associated with the coverage rates. When the provider recommended vaccination, ≥1 dose coverage was 76.9% and ≥3 dose coverage was 55.5%, compared to 43.0% and 28.6%, respectively when the provider did not recommend vaccination ( $p < .001$  for both coverage rates) (Figure 3).

In 2011, more than one quarter (26.5%) of the parents/

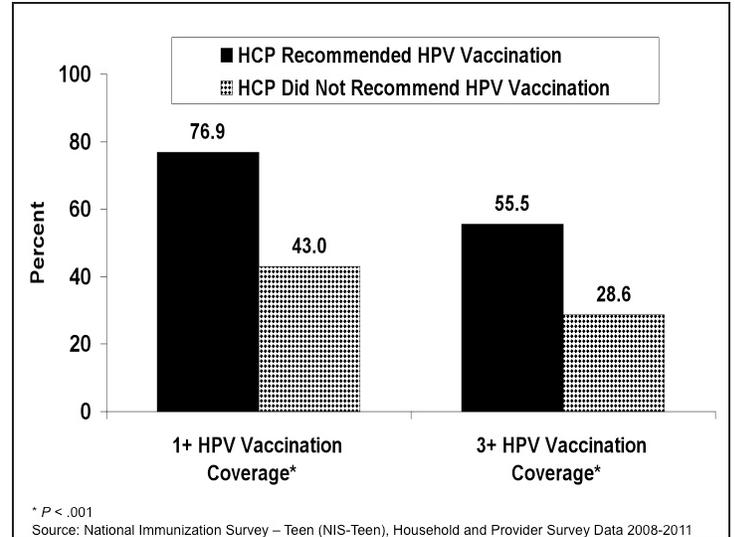


Figure 3. HPV vaccination coverage rates by provider's vaccine recommendation, Rhode Island, 2010-2011 Combined

guardians of female adolescents in Rhode Island reported that their child's health care provider did not recommend HPV vaccine for their child.

#### DISCUSSION

HPV vaccination coverage among Rhode Island female adolescents increased significantly during 2008-2011 and was significantly higher than in the United States. Despite these increases, in 2011, nearly one quarter of RI female adolescents did not initiate the HPV vaccination series and nearly one-half of female adolescents did not complete the 3-dose series. The barriers to vaccination were related to the parent/guardian's lack of knowledge about HPV vaccine, vaccination schedule, and vaccine safety. Rhode Island data also demonstrated that provider's recommendation for HPV vaccination was strongly associated with adolescent's vaccine uptake.

Health care providers (HCPs) have a critical role in improving HPV vaccination. HCPs should educate parents that HPV vaccine is safe and effective in preventing cervical cancer and genital warts, and that HPV vaccine is a 3-dose series administered over 6 months that is most effective when given before their children are exposed to HPV. HCPs should make a strong recommendation for HPV vaccination when patients are 11 or 12 years old, since it is the strongest predictor of vaccination.<sup>5</sup> The recommended routine preadolescent visit at age 11 or 12 years is an excellent opportunity to initiate or complete the HPV vaccination. Reminder/recall systems, use of KIDSNET (Rhode Island's Integrated Child Health Information System that includes Immunization Information System), and the use of every office visit to administer needed vaccinations could improve HPV series completion rates.<sup>5</sup>

There are several limitations in this report. First, the vaccination trends during 2008-2011 should be interpreted with caution, as the sampling methods changed in 2011.<sup>4</sup> Second, HPV vaccination coverage might have been underestimated due to the possible incompleteness of provider-verified vaccination histories. Third, the provider's recommendations for HPV vaccination data were reported by parents/guardians, which is subject to recall bias. Fourth, small sample sizes of female adolescents in Rhode Island data prohibited detailed subgroup analyses, such as race/ethnicity differences. Despite these limitations, this report provides important information on HPV vaccination among Rhode Island female adolescents. ❖

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### Disclosure

The authors have no financial interests to disclose.

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