

## RESEARCH LETTER

## Association of Older Sister's HPV Vaccination Status on HPV Vaccine Receipt by Adolescents

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**Objective:** Efforts to increase human papillomavirus (HPV) vaccine coverage rates in adolescents include finding ways to improve discussions between clinicians and parents. One potentially important piece of information for these discussions is the HPV vaccination status of older siblings.

**Methods:** A nationally representative online panel was used to conduct a cross-sectional survey of parents of children aged 9 to 17 years in October 2012.

**Results:** Overall, 768 adolescents (35%) had  $\geq 1$  older sister aged 10 to 26 years. Male and female adolescents with an older sister who had received no HPV vaccine doses demonstrated higher rates of having no doses themselves, compared with those who had no older sister or those who had an older sister who had received  $\geq 1$  HPV vaccine dose.

**Conclusions:** Discussing the HPV vaccination status of older sisters may be a useful strategy for providers to differentiate HPV vaccine messages to parents of unvaccinated younger siblings. (J Am Board Fam Med 2015;28:816–818.)

**Keywords:** Adolescence, HPV Vaccines, Immunization

Findings from a nationally representative online survey of parents show that human papillomavirus (HPV) vaccination status of older sisters is associated with HPV vaccine receipt among adolescents. This knowledge can help clinicians tailor their discussions with parents about the HPV vaccine.

Routine vaccination of adolescents against HPV has been recommended for females since 2006 and males since 2011.<sup>1,2</sup> HPV vaccination coverage lags behind coverage for other adolescent vaccines; for

example, in 2012, vaccination rates among adolescents aged 13 to 17 years were 85% for the tetanus, diphtheria, and pertussis vaccine, and 74% for the meningococcal vaccine, whereas for the HPV vaccine the rates for  $\geq 1$  dose were 54% for females and 21% for males.<sup>3</sup> Common reasons for not receiving the HPV vaccine include parental lack of knowledge about the vaccine, belief that the vaccination will promote sexual activity, cost, and lack of a provider's recommendation.<sup>4</sup> Strategies to increase HPV vaccine coverage rates include improving communication between clinicians and families.<sup>5</sup> One issue that could influence this discussion is parental experience with HPV vaccination of older siblings. The objective of this study was to explore the association between the HPV vaccination status of US adolescents aged 9 to 17 years and receipt of the HPV vaccine by their older sisters.

### Methods

We conducted a nationally representative, cross-sectional survey of parents of children aged 9 to 17 years using GfK's online KnowledgePanel.<sup>6</sup> KnowledgePanel is a probability-based panel that is representative of the US population in terms of

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respondent sex, age, race/ethnicity, education, and Census region. Panel members were selected using address-based probability sampling. Households are provided with Internet access and hardware, if needed.

This 22-question survey was fielded in October 2012 to 3177 panel members identified from GfK profile data as being a parent of  $\geq 1$  child aged 9 to 17 years. The survey was administered in English and Spanish, and had a completion rate of 57% (1799 of 3177); 1653 of the 1799 survey respondents reported being a parent of  $\geq 1$  child aged 9 to 17 years (92% eligibility rate).

Respondents reported the age and sex of their children 9 to 17 years old and the number of HPV vaccine doses those children received (0, 1, 2, or 3 doses); and the age and sex of their children 18 to 26 years old and HPV vaccine receipt (any or no doses) among those children. We classified adolescents aged 9 to 17 years into 3 groups based on whether they had  $\geq 1$  older sister aged 10 to 26 years who had received no HPV vaccine doses,  $\geq 1$  older sister who had received any HPV vaccine doses, or no older sister aged 10 to 26 years.

GfK provided de-identified data, and Census-based post-stratification weights were used to match the US population distribution on respondent sex, age, race/ethnicity, education, and Census region. The study team generated frequency distributions, as well as bivariate analyses of adolescent HPV vaccination status by older sister(s)' vaccination status; these analyses were performed by age/sex grouping (females 9 to 12 and 13 to 17 years, males 9 to 12 and 13 to 17 years). Unweighted numbers and weighted proportions are presented. The study was approved by the University of Michigan Medical School Institutional Review Board.

## Results

The 1653 respondents reported complete data on age, sex, and number of HPV vaccine doses for 2511 adolescents aged 9 to 17 years. Receipt of  $\geq 1$  dose of the HPV vaccine was 48% among females 13 to 17 years, 21% among females 9 to 12 years, 26% among males 13 to 17 years, and 19% among males 9 to 12 years.

Overall, 768 adolescents (35%) had  $\geq 1$  older sister aged 10 to 26 years. Across sex and age groups, adolescents with an older sister who had received no HPV vaccine doses demonstrated

**Table 1. Human Papillomavirus Vaccine (HPV) Receipt Among Adolescents By Sex/Age Group and Human Papillomavirus Vaccine Vaccination Status of Older Sisters**

	Adolescents (unweighted n)	HPV Doses Received (weighted n, %)		
		0	1 or 2	3
<b>Females aged 9–12 years*</b>				
No older sister	345	79	16	5
Older sister(s), no HPV doses	104	93	7	0
Older sister(s), any HPV doses	93	54	29	17
<b>Females aged 13–17 years*†</b>				
No older sister	467	52	21	27
Older sister(s), no HPV doses	121	81	12	7
Older sister(s), any HPV doses	118	21	27	52
<b>Males aged 9–12 years*</b>				
No older sister	377	76	20	4
Older sister(s), no HPV doses	115	98	2	0
Older sister(s), any HPV doses	108	75	18	7
<b>Males aged 13–17 years*†</b>				
No older sister	454	74	20	6
Older sister(s), no HPV doses	93	91	5	4
Older sister(s), any HPV doses	116	59	25	16

\* $P < .001$ , comparison of 0 vs  $\geq 1$  dose.

† $P < .001$ , comparison of 0 vs 1 or 2 vs 3 doses.

higher rates of having no HPV vaccine doses themselves, compared with either adolescents with no older sister or those with an older sister who had received  $\geq 1$  HPV vaccine dose (Table 1).

## Discussion

We found that HPV vaccine receipt by an older sister (up to age 26 years) is correlated with HPV vaccine receipt among younger sisters. By contrast, having an older sister who received no HPV vaccine doses was strongly associated with receipt of no doses among younger sisters and brothers. Asking about the HPV vaccination status of older siblings may help clinicians tailor their discussions around the HPV vaccine. For example, identifying that an older daughter did not receive the HPV

vaccine could prompt a discussion of the reasons why she was not vaccinated, which could in turn provide an opportunity to convey current data on safety and effectiveness,<sup>5</sup> discuss insurance coverage for vaccination, and emphasize the vaccine's protection against different types of cancer.<sup>7</sup> Counseling parents about a younger sibling's HPV vaccination also may prompt a discussion about catch-up vaccination of an unvaccinated older sister or brother.

Although the study is limited by a lack of clinical verification of HPV vaccine receipt, parent report has been shown to be a reasonable approximation of provider-reported rates.<sup>8</sup> The rates for completion of  $\geq 1$  dose of HPV vaccine from this study vary slightly from national, provider-verified rates for the same year, which may be the result of substantially lower participation rates for the national provider-verified data.<sup>3</sup>

## Conclusion

Asking about the HPV vaccination status of older sisters may be a useful strategy for providers to differentiate HPV vaccine messages.

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