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## ACCURACY OF SELF-REPORTED HPV VACCINE RECEIPT AMONG ADOLESCENT GIRLS AND THEIR MOTHERS

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### Keywords

HPV; vaccine; adolescents; self-report

Adult self-report of vaccination status has been demonstrated to be variably accurate for a number of different vaccines [1–6]. Generally, recall of vaccines has high sensitivity and reasonable specificity, but findings have differed depending on the type of vaccination and certain demographic characteristics. There is limited research on the accuracy of self-reported vaccination status in adolescents, and specifically regarding human papillomavirus (HPV) vaccination.

Understanding HPV vaccination status has research and clinical implications. In many research studies, and some instances within clinical practice, self-reported vaccination status is relied on to obtain immunization history and inform the need for further vaccinations [5]. The current study used medical records and self-administered questionnaires to compare actual HPV vaccination status with self-reported and parent-reported receipt of HPV vaccine among adolescent girls in an urban setting.

### Methods

Adolescent girls (N=74; ages 14–17 years at enrollment) and their female guardians (referred to here as mothers) were recruited from urban adolescent clinics over a 5 month period. The mothers and girls each completed a questionnaire regarding sexual behaviors, attitudes, and knowledge about HPV vaccine. The research assistant was present during the administration of the survey to ensure the girls and their mothers did not converse while completing the questionnaire. Adolescent girls were asked to recall if they had received one or more doses of HPV vaccine and approximate date(s) of the shot(s). Mothers were asked parallel questions about daughters' HPV vaccination histories. Both were asked to complete

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an 18-item HPV knowledge scale, adapted from a previous study [7]. Medical records were abstracted for vaccine dates to compare HPV vaccine recall with actual receipt of one or more doses of vaccine. Analysis of variance was conducted on knowledge scores to compare mothers and daughters who accurately reported vaccination status with those who did not, and chi-square analysis was utilized to assess frequency of sexual behaviors and girls' accuracy of self-reports. Both sensitivity, the proportion of participants who reported a history of receiving one or more HPV vaccine doses in agreement with the daughter's medical record; and specificity, the proportion of participants who reported a history of not receiving HPV vaccination in agreement with the daughter's medical record, were calculated for mothers and daughters.

## Results

The 74 girls in this study were ages 14–17 years (Mean=15.5, SD=1.1) and 83% identified as Black, 9% as white, and 7% as mixed ethnicities or Hispanic, which reflects the racial/ethnic makeup of the clinics. Most of the participants were sexually active before enrollment (76%) and 75% reported sexual intercourse within the previous two months.

Medical records showed that 89% (66/74) of girls had received the first dose of HPV vaccine, 78% (58/74) had received the second dose, and 65% (48/74) had received all three doses. However, only 36 of the 66 adolescents who received vaccine reported getting vaccinated (sensitivity = 0.54) and only 50 mothers of 66 vaccinated adolescents accurately reported that their daughters received HPV vaccine (sensitivity = 0.76). Moreover, only 17 of the 48 adolescents (35%) who received all 3 doses accurately reported completing the vaccine series, with 20/48 (42%) saying that they had received no vaccine at all. Their mothers were only slightly more accurate, with 25/48 (52%) correctly indicating their daughter had received all 3 vaccine doses and 9 (19%) reporting that their daughter had received no vaccine. For those whose medical records indicated no vaccination, all 8 mothers and daughters accurately reported no doses of vaccine (specificity = 1.0). Predictive values are reported in Table 1.

Of the adolescents who were vaccinated and did not receive their first dose on the day of the survey (n = 59), girls who were accurate in their self-reported vaccination status ( $\geq 1$  dose) were not more likely to have been sexually active in the past two months ( $p = .75$ ), or have more sexual partners in that timeframe ( $p = .81$ ). Among the 66 daughters who had received any HPV vaccine, mothers who inaccurately reported no receipt of vaccine had lower HPV knowledge scores compared to accurate reporters [ $F(1,65) = 5.21$ ;  $p = .02$ ]. HPV knowledge scores were unrelated to accuracy of reporting among the daughters. Age of the girls, and times since first or last sex were not related to accuracy of self-report.

## Discussion

We found high levels of inaccuracy between actual HPV vaccination status and self-reported vaccine receipt. The errors all involved under-reporting of vaccination status. This finding has relevance for researchers who rely on self-report, and limited implications for clinical practice, i.e., in cases when vaccine status cannot be verified. Confirmation of self-reported vaccination status is important, and these data support the need for immunization registries.

Whether parents and adolescents accurately remember their HPV vaccination status may depend on several factors, including HPV vaccine-related attitudes of the population and health care provider communication about HPV. Certain populations may have families that pay less attention to specific vaccines, and therefore have lower accuracy in reporting vaccination status. Additionally, the sensitivity and specificity of a measure depend greatly

on the population in which it is administered [8]. We found HPV vaccination rates to be higher than the estimated vaccination coverage for both Indiana (37.1%,  $\geq 1$  dose) and Marion County (52%,  $\geq 1$  dose) [9]. The high HPV vaccination rates in this population deflate the negative predictive value, because there are far less true negatives. The low NPV may also be a product of provider delivery of vaccines to adolescents (i.e. multiple vaccines administered at once) [10], in which case adolescents and their parents may not know exactly which vaccines they have received. We did not ask about other adolescent vaccines, but the results might have been similar for other simultaneously administered vaccines. It is important to note that our findings are limited by the relatively small sample size and that our sample was relatively homogeneous in terms of geography, ethnicity, and socio-economic status.

These findings have some implications regarding concerns that HPV vaccination encourages adolescent sexual behavior. If a large percentage of adolescents cannot remember if they have been vaccinated, it is unlikely that sexual behaviors will change as a result of vaccination. More research is needed in order to examine this effect, but these data suggests that HPV vaccination is not a salient enough event for many adolescent girls to change their sexual behavior patterns.

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**Table 1**

Sensitivity and specificity of girls' and mothers' self-reported HPV vaccination status for 1<sup>st</sup> dose of vaccine (n = 74)

	Medical Records		
	Vaccine	No vaccine	
Girls' Self-Report			
Vaccine	36	0	PPV = 1.0
No/unknown vaccine	30	8	NPV = 0.21
	Sensitivity = 0.54	Specificity = 1.0	Percentage agreement = 59.5
Mothers' Reported vaccine status (of daughter)			
Vaccine	50	0	PPV = 1.0
No/unknown vaccine	16	8	NPV = 0.33
	Sensitivity = 0.76	Specificity = 1.0	Percentage agreement = 78.4