

One in Four California Adolescent Girls Have Had Human Papillomavirus Vaccination

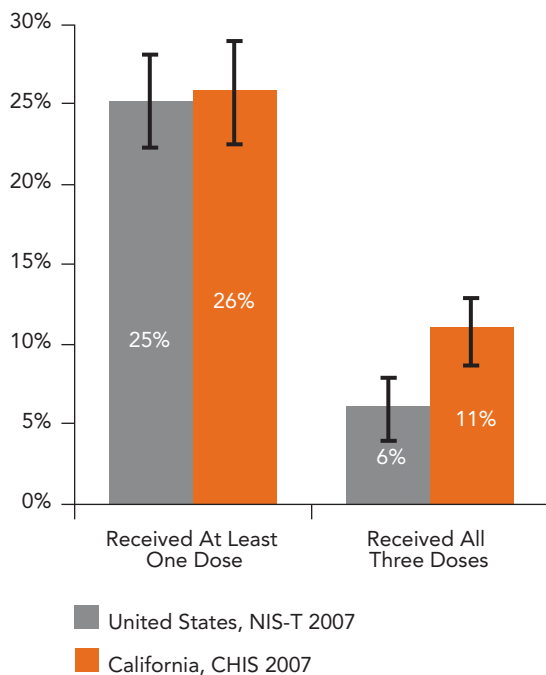
David Grant, Nicole Kravitz-Wirtz, Nancy Breen, Jasmin A. Tiro and Jennifer Tsui

Human papillomavirus (HPV) is the most common sexually transmitted infection in the United States. An estimated 6.2 million people are infected every year, including over 4.5 million young people between 15 and 24 years of age.¹ In June 2006, the first vaccine to prevent HPV strains 6, 11, 16 and 18 was licensed by the U.S. Food and Drug Administration (FDA) for use among females 9 to 26 years of age.² Although most infections clear naturally, persistent infection with these strains of HPV are causally associated with about 90% of genital warts and up to 70% of all cervical cancers.³ The licensed vaccine, Gardasil™, is administered in a series of three injections over a six-month period and targets the four previously mentioned HPV types most commonly associated with genital warts and

cervical cancer. Beginning in March 2007, the Centers for Disease Control and Prevention’s Advisory Committee for Immunization Practices (ACIP) recommended routine HPV vaccination for girls 11 to 12 years of age and “catch-up” vaccination for teens and young women ages 13 to 26 years.⁴ Despite some initial safety concerns, heightened by widely publicized debate surrounding school-entry mandates, all evidence to date suggests that the HPV vaccine is effective and safe.^{5, 6, 7}

Using data from the 2007 California Health Interview Survey (CHIS 2007), this policy brief presents the first statewide HPV vaccination estimates among teen girls ages 13-17 and young women ages 18-26 since the ACIP recommendations were published. Knowledge of HPV, awareness of the HPV vaccine and vaccination acceptability among females ages 13-64 and parents of vaccine-eligible daughters ages 9-17 in California are also reported.

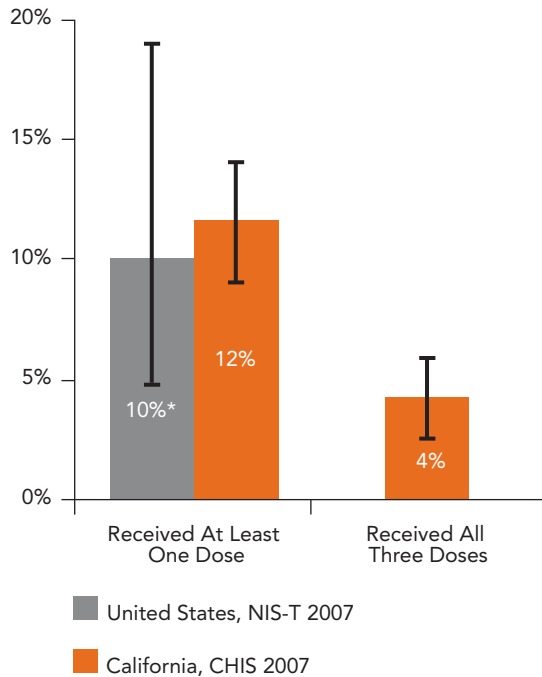
Exhibit 1
HPV Vaccination Among Teen Girls Ages 13-17 by Vaccine Dose, United States and California, 2007



Note: I = 95% Confidence Interval

Exhibit 2

HPV Vaccination Among Young Women Ages 18-26 by Vaccine Dose, United States and California, 2007



Note: I = 95% Confidence Interval

*NIS-Adult data for HPV vaccine initiation (received at least one dose) is, according to CDC, unreliable by definition; the relative standard error is greater than 0.30 of the estimate. The proportion of young women ages 18-26 who received all three vaccine doses was not reported. Additional information about NIS-Adult 2007 can be found at <http://www.cdc.gov/vaccines/stats-surv/nis/downloads/nis-adult-summer-2007.pdf>.

One in Four Teen Girls in California Had Initiated the HPV Vaccine in 2007

Among teen girls in California ages 13-17, about 378,000 (26%) out of 1,468,000 reported receiving at least one dose of the vaccine. These findings are consistent with data reported from the 2007 National Immunization Survey-Teen (NIS-T 2007), showing that 25% of 13 to 17 year old females nationwide had initiated the HPV vaccine in 2007.⁸ The NIS-T data are based on parents' reports and confirmed by provider-reported immunization records. In California, 11% of teen girls had completed the three-dose HPV vaccine series (42% of vaccine initiators), whereas only 6% of teen girls nationwide had received all three doses (24% of vaccine initiators) by the interview dates (Exhibit 1).⁹ HPV-vaccine recipients in California appear almost twice as likely to

have received all three doses as teenage girls nationwide. However, the higher rates in California may be due to the fact that CHIS 2007 was in-the-field later than NIS-T 2007.¹⁰

Because HPV is transmitted through sexual contact and often acquired soon after onset of sexual activity, females not yet sexually active and those with few sex partners are expected to benefit more fully from HPV vaccination.¹¹ Thus, the early teen years provide a timely opportunity for vaccine intervention and HPV-related disease prevention.

HPV Vaccination Among Young Adult Women Ages 18-26 in California

Although overall vaccine effectiveness generally decreases with age and greater likelihood of HPV exposure from increasing sex partners, the majority of young adult women can still benefit from vaccination.^{12, 13} In California, about 262,000 (12%) out of 2,273,000 females aged 18 to 26 years reported receiving at least one dose of the vaccine in 2007 and 4% had completed the vaccine series (38% of vaccine initiators). These findings provide the first reliable HPV vaccination estimates among women in this age group (Exhibit 2).

Sexually active young women ages 18-26 who have not been infected with any of the four HPV strains would receive full benefit from vaccination, while young women already infected would be protected against disease associated with the other strains. Thus, the majority of young women will derive some benefit from HPV vaccination.¹⁴

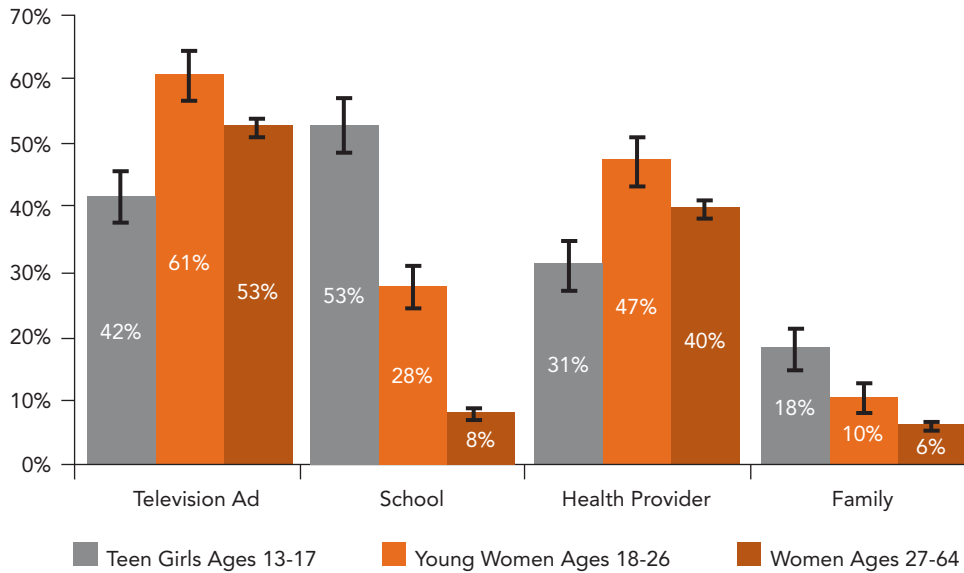
The vaccine, however, does not protect against all HPV types that can lead to cervical cancer. It is critical, therefore, that even vaccinated women continue to receive regular cervical cancer screening tests, such as the Pap test.

HPV Awareness Nearly Doubles in California Since Vaccine Approval

Before the HPV vaccine was introduced, few women had heard of HPV.^{15, 16} Since the vaccine's approval in 2006, marketing

Source of HPV Awareness by Age Group, California 2007

Exhibit 3



Note: I = 95% Confidence Interval

and media coverage has contributed to a dramatic increase in HPV awareness. In 2007, 74% of teen girls ages 13-17, 79% of young adult women ages 18-26, and 76% of older adult women ages 27-64 reported having heard of HPV.

Although HPV awareness in California was similar among age groups, there were notable differences in *where* respondents had heard of HPV. Television advertisements were the most commonly cited source among both young adult women ages 18-26 (61%) and older adult women ages 27-64 (53%), as well as a common source of awareness among teen girls ages 13-17 (42%). However, school was the most frequently cited source of HPV information for teen girls ages 13-17 (53%). Other frequently cited sources of HPV awareness across age groups included health care providers and family members (Exhibit 3). HPV awareness source was assessed by asking respondents where they had heard about HPV; respondents could report as many sources as applicable.

Majority of Women and Girls in California Want to be Vaccinated

Vaccine acceptability may influence an individual's intended vaccination behavior

and provides an additional indicator of future vaccine coverage. When asked if they would be interested in receiving the HPV vaccine, 76% of teen girls ages 13-17 and 60% of young adult women ages 18-26 reported an interest in getting the HPV vaccine themselves, while 57% of parents of age-eligible girls reported an interest in getting the HPV vaccine for their daughters (Exhibit 4). These findings are consistent with estimates from a representative statewide analysis showing that 75% of California parents would be likely to vaccinate their daughter before age 13, and an additional 6% would be likely to vaccinate their daughter before age 16.¹⁷

Not knowing enough about the vaccine was the main reason cited by young adult women ages 18-26 (31%) and parents of age-eligible daughters (54%) who were *not* interested in receiving the HPV vaccine. Other frequently cited explanations included concerns about the vaccine's safety and questions about the vaccine's necessity.¹⁸ While these findings are suggestive, further probing would be needed to clarify and differentiate the main reasons for not wanting to receive the vaccine. Comparable data from girls aged 13 to 17 years are not included because the teen

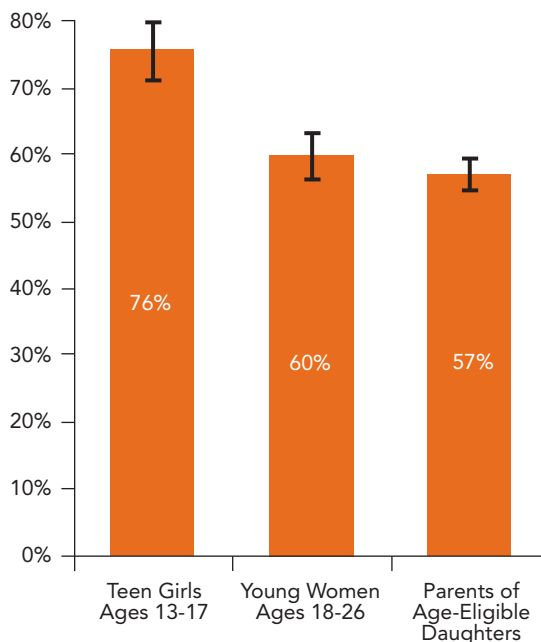
version of CHIS 2007 did not include a question about why they would not want to be vaccinated (Exhibit 5).

Uncertainty and safety concerns can be expected when any new vaccine is introduced. The HPV vaccine has attracted a particularly large amount of media attention due to recent, widely publicized controversies about HPV vaccine mandates and, to a lesser extent, the relationship between childhood vaccinations and autism.^{19, 20} Although scientific evidence does not support a link between vaccines and autism,²¹ the timing of such publicity likely heightened concerns about the HPV vaccine. While no vaccine is completely without risk, the HPV vaccine has been tested in thousands of girls and young women ages 9-26 around the world with no serious side effects.²²

(Continued on Page 5)

Percent Interested in Receiving HPV Vaccine, Teen Girls, Young Women and Parents of Age-Eligible Daughters, California, 2007

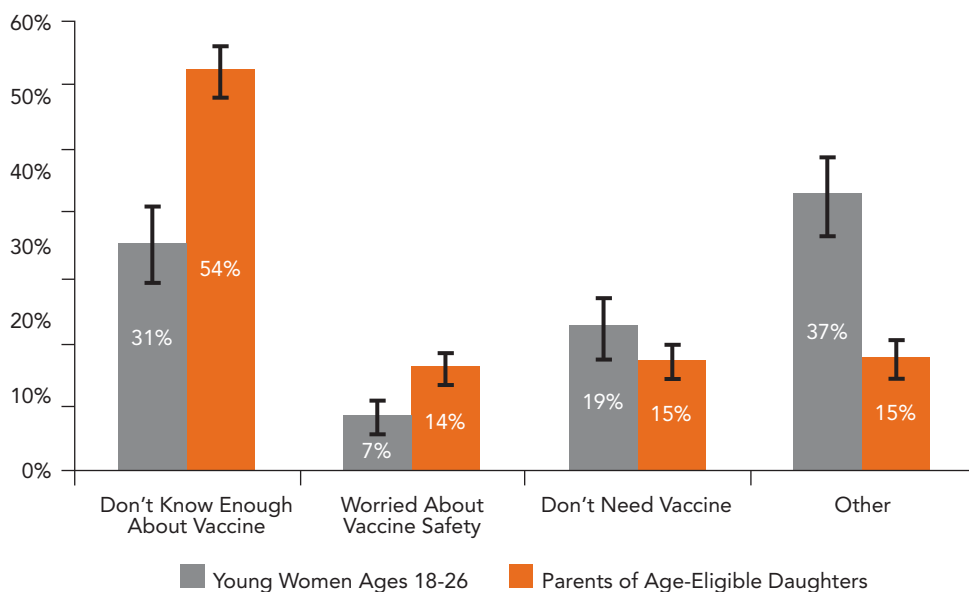
Exhibit 4



Note: I = 95% Confidence Interval

Reasons Not Interested in Receiving HPV Vaccine, Young Women and Parents of Age-Eligible Daughters, California, 2007

Exhibit 5



Note: I = 95% Confidence Interval

Discussion

This is the first data published on HPV vaccine use and acceptability for any state. Continued HPV vaccine monitoring in California and the nation, including girls ages 11-12 targeted for routine vaccination, would provide the opportunity to track trends in vaccine coverage, HPV-related disease incidence, HPV awareness, vaccine acceptability, and to identify populations with disproportionately lower vaccine receipt. Forthcoming analyses will explore additional factors associated with acceptability and uptake of the HPV vaccine, such as race/ethnicity, socioeconomic status and access to health care.

About CHIS/Data Source

The California Health Interview Survey is a collaboration of the UCLA Center for Health Policy Research, the California Department of Public Health, the Department of Health Care Services and the Public Health Institute. Funding for the CHIS 2007 statewide survey was provided by the California Department of Health Care Services, The California Endowment, the National Cancer Institute, the Robert Wood Johnson Foundation, the California Children and Families Commission, the California Office of the Patient Advocate, the California Department of Mental Health, the Centers for Disease Control and Prevention (CDC), Kaiser Permanente, Blue Shield of California, LA Care Health Plan, the San Diego County Health and Human Services Agency, and the California Attorney General's Crime and Violence Prevention Center. For additional information on CHIS, visit www.chis.ucla.edu.

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Acknowledgements

The authors would like to thank members of the CHIS 2007-HPV work group for their assistance developing the HPV questionnaire module. For their support and assistance with this brief, the authors would also like to thank CHIS Principal Investigator Dr. E. Richard Brown at the UCLA Center for Health Policy Research; Dr. Martin L. Brown, chief of the National Cancer Institute's Health Services and Economics Branch, Applied Research Program, Division of Cancer Control and Population Sciences; and Dr. Y. Jenny Chia, assistant director of Statistical Support at the UCLA Center for Health Policy Research.

Suggested Citation

Grant D, Kravitz-Wirtz N, Breen N, Tiro JA, Tsui J. *One in Four California Adolescent Girls Have Had Human Papillomavirus Vaccination*. Los Angeles, CA: UCLA Center for Health Policy Research, 2009.

Notes

- 1 Markowitz LE, Dunne EF, Saraiya M, Lawson HW, Chesson H, Unger ER. Quadrivalent Human Papillomavirus Vaccine: Recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR* 2007;56(No. RR-2):1-24.
- 2 Markowitz LE, Dunne EF, Saraiya M, et al. Quadrivalent Human Papillomavirus Vaccine: Recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR* 2007;56(No. RR-2):1-24.
- 3 CDC. Vaccines and preventable diseases: HPV vaccine – questions and answers. Available at <http://www.cdc.gov/vaccines/vpd-vac/hpv/vac-faqs.htm>.
- 4 Ibid.
- 5 Haber G, Malow R, Zimet G. The HPV vaccine mandate controversy. *Journal of Pediatric and Adolescent Gynecology* (2007) 20:325-331.
- 6 CDC. Information from FDA and CDC on Gardasil and its safety. Available at http://www.cdc.gov/vaccinesafety/vaers/fda_and_cdc_statement.htm.
- 7 Harper DM, Franco EL, Wheeler C, Ferris DG, Jenkins D, Schuind A, Zahaf T, Innis B, Naud P, De Carvalho NS, Roteli-Martins CM, Teixeira J, Blatter MM, Korn AP, Quint W, Dubin G. Efficacy of a bivalent L1 virus-like particle vaccine in prevention of infection with human papillomavirus types 16 and 18 in young women: a randomised controlled trial. *Lancet*. 2004 Nov 13; 364(9447): 1757-65.

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PB2009-3

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8 CDC. Vaccination coverage among adolescents aged 13-17 years – United States, 2007. *MMWR* 2008;57(40):1100-1103.

9 Ibid.

10 CHIS 2007 was conducted from June 2007 through March 2008. NIS-T 2007 was conducted during the fourth quarter 2007 only.

11 Markowitz L, Dunne E, Saraiya M, et al. Quadrivalent Human Papillomavirus Vaccine: Recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR* 2007;56(No. RR-2):1-24.

12 Center for Biologics Evaluation, Product Approval Information – Licensing Action, June 2006.

13 Markowitz L, Dunne E, Saraiya M, et al. Quadrivalent Human Papillomavirus Vaccine: Recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR* 2007;56(No. RR-2):1-24.

14 Ibid.

15 Tiro JA, Meissner HI, Kobrin S, Chollette V. What do women in the U.S. know about human papillomavirus and cervical cancer? *Cancer Epidemiology, Biomarkers and Prevention*. 2007 Feb;16(2):288-94.

16 NCI. In 2005, 61 percent of American women had never heard of HPV. HINTS Briefs: Number 5, Mar 2007. Available at http://bints.cancer.gov/docs/HINTS_Brief030207.pdf.

17 Constantine N, Jerman P. Acceptance of human papillomavirus vaccination among Californian parents of daughters: a representative statewide analysis. *Journal of Adolescent Health* (In press).

18 Respondents reported the main reason they would not want to get the HPV vaccine. Answers were classified within the following categories: 1) Does not need vaccine; 2) Not sexually active; 3) Too expensive; 4) Too old/too young for vaccine; 5) Doctor didn't recommend it; 6) Worried about safety of vaccine; 7) My spouse/family member is against it; 8) Don't know enough about the vaccine; or 9) Other. Responses recorded as "does not need vaccine", "not sexually active", or "too old/too young for vaccine" reflect concerns related to the vaccine's necessity and were combined into a single category, "don't need vaccine."

19 Haber G, Malow R, Zimet G. The HPV vaccine mandate controversy. *Journal of Pediatric and Adolescent Gynecology* (2007) 20:325-331.

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21 CDC. Mercury and vaccines (thimerosal). Available at <http://www.cdc.gov/vaccinesafety/concerns/thimerosal.htm>.

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