

Human Papillomavirus Vaccine Among Adult Women

Disparities in Awareness and Acceptance

Yan Cui, MD, PhD, Susie B. Baldwin, MD, MPH, Dorothy J. Wiley, PhD,
Jonathan E. Fielding, MD, MPH

Background: Human papillomavirus (HPV) vaccines have been shown to be safe and highly effective in young and middle-aged women.

Purpose: This study aimed to assess vaccine awareness and desire for vaccination among adult women aged 18–55 years residing in Los Angeles County CA.

Methods: This study is nested in the 2007 Los Angeles County Health Survey. Included in the analyses were 2295 women aged 18–55 years. Logistic regression was used to evaluate vaccine awareness and intention to become vaccinated in association with various factors. All analyses employed weighted data and were conducted in 2009.

Results: Only 5% of women aged 18–26 years had received the HPV vaccine in its first year on the market. Overall, 67% of women aged 18–55 years had heard of the vaccine. Among those who knew of the vaccine but had not received it, 61% reported they were likely to receive the vaccine. Latina, black, and Asian/Pacific Islander women were only half as likely to have heard of the vaccine as white women, but Latinas and Asian/Pacific Islander women were more willing to be vaccinated than white or black women. Education was associated positively with awareness, but inversely associated with intention to be vaccinated. Awareness and desire for vaccination also varied substantially by other factors such as language spoken at home.

Conclusions: This population-based study of diverse women reveals important disparities in HPV vaccine awareness and intention to be vaccinated. Culturally and linguistically competent educational campaigns about HPV immunization are warranted, and should target high-risk populations.

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Introduction

Human papillomavirus (HPV) vaccines are safe and highly effective against type-specific infections in women aged ≤ 55 years.^{1,2} However, little is known about awareness and acceptance of the vaccine among diverse groups of women, or whether an older target population would avail themselves of the vaccine. Survey data collected in 2007 were used to assess awareness and acceptance of the quadrivalent HPV vac-

cine in its first year on the market among a random sample of women aged 18–55 years residing in Los Angeles (LA) County CA.

Methods

The present study is nested in the 2007 LA County Health Survey (LACHS), a periodic survey that has been described extensively elsewhere.^{3–5} Briefly, a sample of LA County households were selected by random-digit dialing, and one adult respondent was selected randomly from each household. Computer-assisted telephone interviews were conducted in six languages (English, Spanish, Cantonese, Mandarin, Korean, and Vietnamese) from April to December 2007. The survey response and cooperation rates were 18% and 40%, respectively.⁶

Women were asked whether they had ever heard of a vaccine to prevent HPV and cervical cancer. (At the time of the survey, the quadrivalent HPV vaccine, but not the bivalent vaccine, was licensed in the U.S.) Women aged 18–26 years who knew of the vaccine were then asked if they had received any HPV shots; those

From the Los Angeles County Department of Public Health (Cui, Baldwin, Fielding); and the School of Nursing, University of California Los Angeles (Wiley), Los Angeles, California

Address correspondence to: Susie Baldwin, MD, MPH, Office of Health Assessment and Epidemiology, Los Angeles County Department of Public Health, 313 N. Figueroa Street, Suite 127, Los Angeles CA 90012. E-mail: sbaldwin@ph.lacounty.gov.

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who had not were asked whether they were very likely, somewhat likely, not too likely, or not at all likely to receive the vaccine. Moreover, women aged 27–55 years who had heard of the vaccine were asked whether they would be likely to get vaccinated, if the vaccine were available to them.

Awareness and intention to undergo vaccination were assessed in association with factors listed in Table 1. Women reporting that they were very likely or somewhat likely to get vaccinated were categorized as intending to get vaccinated. Intention was analyzed only among women who had heard of the vaccine but had not received it. Logistic regression was used to calculate AORs, CIs, and *p*-values for trends. Data analyses were conducted in 2010 and weighted data were used to account for survey design effects.

Results

Included in the study were 2295 women aged 18–55 years, of whom 311 were aged 18–26 years. The study population reflected the racial/ethnic and linguistic diversity of LA County residents (data not shown). Only 5% (95% CI=2.4%, 7.5%) of women aged 18–26 years had received at least one dose of HPV vaccine within 1.5 years of the licensure of the quadrivalent vaccine. The small number of vaccinated women (*n*=17) precluded further exploration among this group.

Overall, 67% (95% CI=64%, 69%) of women aged 18–55 years had heard of the HPV vaccine before the interview. Latinas, black, and Asian/Pacific Islander women were about half as likely to have heard of the vaccine as white women (Table 1). Positive trends were observed for both education and income levels. Moreover, foreign-born respondents were about half as likely to know of the vaccine as those U.S.-born. Women who reported speaking languages other than English and Spanish at home were only one fifth as likely to have heard of the vaccine as were English speakers; the majority of these women spoke Asian/Pacific Islander languages at home.

Among women aged 18–55 years who were aware of the HPV vaccine but had not received it, 61% (95% CI=58%, 64%) reported they were likely to receive the vaccine. Women aged 27–49 years were more willing to get vaccinated than those aged 18–26 years (Table 1). Latinas and Asian/Pacific Islander women were more willing to become vaccinated than were white or black women. Compared to women with college or postgraduate degrees, women who had less than a high school education were more than three times more willing to get vaccinated. Although intention to get vaccinated did not vary by country of birth, women who spoke languages other than English and Spanish at home were more willing to get vaccinated than were English speakers. Intention also varied by marital status, health insurance coverage, and history of HIV testing.

Discussion

More than 1 year after licensure of the HPV vaccine, very few young adult women eligible for vaccination in LA County had received it. Given the short time frame, women may not have had time to receive the vaccine although they were aware of it and intended to be vaccinated. Nevertheless, other factors might have contributed to the low HPV vaccination rate, including lack of awareness, lack of interest or urgency, lack of vaccine access, or a combination of these. Because awareness and interest in vaccination were relatively high among eligible adult women, lack of a sense of urgency and lack of vaccine access might be key contributors to the low vaccination rate. The quadrivalent HPV vaccine is one of the most expensive vaccines on the market, making it cost prohibitive for most low-income, uninsured women. Notably, nearly a quarter of women aged 18–26 years in Los Angeles County were uninsured in 2007, and few community clinics had offered HPV vaccination to eligible low-income adults.

Most cervical cancer morbidity and mortality is borne by low-income women and women of color,⁷ so these women stand to gain the most from widespread implementation of prophylactic HPV vaccination. However, the data suggest that the populations of women who might benefit most from the vaccine were the least aware of it in 2007. Poor women and women of color may have had relatively low awareness of HPV and its relationship to cervical cancer prior to introduction of the vaccine,⁸ and vaccine-prevention messages may not have penetrated effectively into these communities in the first year that the vaccine was licensed.

Relatively low awareness and acceptance of the HPV vaccine among black women warrants further study, particularly given this population's disproportionately high prevalence of cervical cancer. In general, vaccination levels among blacks are low compared to other racial/ethnic groups, possibly reflecting lack of knowledge and awareness, concerns about vaccine safety, distrust, and issues related to healthcare access among this population.^{9,10}

Among Asian/Pacific Islander women, those who spoke Asian/Pacific Islander languages at home were much less likely to know of the vaccine but were much more interested in vaccination than those who spoke English at home. A complex interplay of ethnicity and language clearly affects women's awareness of and attitudes toward the HPV vaccine, possibly reflecting underlying cultural beliefs about immunization and heterogeneous exposure to HPV vaccine messages through geo-ethnic media.

Table 1. Awareness and acceptance of HPV vaccine among women aged 18–55 years in Los Angeles County

| Variable | Awareness | | Acceptance ^a | |
|---|--------------------------|----------------------------|------------------------------|---------------------------|
| | Heard of HPV vaccine (%) | AOR ^b (95% CI) | Likely to get vaccinated (%) | AOR ^b (95% CI) |
| Age (years) | | | | |
| 18–26 (ref) | 65.2 | 1.00 | 56.1 | 1.00 |
| 27–29 | 69.4 | 0.80 (0.46, 1.40) | 68.9 | 3.13 (1.48, 6.64) |
| 30–39 | 67.2 | 0.99 (0.65, 1.51) | 71.3 | 3.71 (2.16, 6.35) |
| 40–49 | 67.3 | 0.90 (0.57, 1.42) | 57.0 | 2.54 (1.48, 4.37) |
| 50–55 | 61.8 | 0.55 (0.33, 0.91) | 44.2 | 1.61 (0.86, 3.04) |
| Race/ethnicity | | | | |
| White (ref) | 88.7 | 1.00 | 49.3 | 1.00 |
| Latina | 52.5 | 0.53 (0.33, 0.86) | 72.6 | 1.73 (1.12, 2.67) |
| African-American | 77.9 | 0.52 (0.30, 0.91) | 60.1 | 1.13 (0.67, 1.91) |
| Asian/Pacific Islander | 59.3 | 0.53 (0.30, 0.95) | 63.7 | 2.28 (1.25, 4.14) |
| Education | | | | |
| College or postgraduate degree (ref) | 84.1 | 1.00 | 54.8 | 1.00 |
| Some college or trade school | 75.5 | 0.66 (0.43, 1.02) | 57.4 | 1.06 (0.73, 1.56) |
| High school | 60.2 | 0.37 (0.23, 0.60) | 60.7 | 1.08 (0.65, 1.80) |
| Less than high school | 40.0 | 0.30 (0.18, 0.49) | 85.0 | 3.18 (1.59, 6.37) |
| | | p trend < 0.0001 | | p trend = 0.014 |
| Income (% of federal poverty level) | | | | |
| ≥300 (ref) | 86.6 | 1.00 | 53.6 | 1.00 |
| 200–299 | 74.2 | 0.81 (0.50, 1.32) | 59.8 | 0.89 (0.55, 1.44) |
| 100–199 | 60.4 | 0.61 (0.38, 0.99) | 65.2 | 0.78 (0.45, 1.35) |
| 0–99 | 45.2 | 0.53 (0.31, 0.92) | 73.5 | 0.61 (0.33, 1.14) |
| | | p trend = 0.018 | | <i>p trend = 0.12</i> |
| Marital status | | | | |
| Married (ref) | 66.0 | 1.00 | 57.1 | 1.00 |
| Domestic partners/not married but living together | 48.1 | 0.60 (0.39, 0.93) | 74.3 | 2.02 (0.97, 4.18) |
| Widowed/divorced/separated | 64.9 | 0.82 (0.55, 1.21) | 63.2 | 2.10 (1.35, 3.26) |
| Never married | 74.3 | 1.14 (0.78, 1.68) | 62.5 | 1.98 (1.19, 3.30) |
| Language used most at home | | | | |
| English (ref) | 81.6 | 1.00 | 56.4 | 1.00 |
| Spanish | 44.7 | 1.04 (0.65, 1.66) | 75.2 | 1.65 (0.89, 3.04) |
| Asian/Pacific Islander and other languages ^c | 40.5 | 0.21 (0.11, 0.41) | 68.4 | 2.86 (1.12, 7.31) |
| Country of birth | | | | |
| U.S. (ref) | 82.3 | 1.00 | 55.8 | 1.00 |
| Foreign country | 46.5 | 0.49 (0.32, 0.76) | 72.8 | 1.10 (0.69, 1.76) |

(continued on next page)

Table 1. Awareness and acceptance of HPV vaccine among women aged 18–55 years in Los Angeles County (continued)

| Variable | Awareness | | Acceptance ^a | |
|---|--------------------------|---------------------------|------------------------------|---------------------------|
| | Heard of HPV vaccine (%) | AOR ^b (95% CI) | Likely to get vaccinated (%) | AOR ^b (95% CI) |
| Insurance | | | | |
| Private (ref) | 79.9 | 1.00 | 54.6 | 1.00 |
| Public | 53.7 | 0.75 (0.49, 1.14) | 78.6 | 2.37 (1.33, 4.24) |
| No insurance | 47.2 | 0.75 (0.51, 1.12) | 68.2 | 0.89 (0.49, 1.59) |
| Had regular source of care | | | | |
| Yes (ref) | 68.0 | 1.00 | 60.7 | 1.00 |
| No | 60.3 | 1.19 (0.82, 1.74) | 62.0 | 0.82 (0.49, 1.37) |
| Difficulty accessing medical care | | | | |
| No (ref) | 73.8 | 1.00 | 57.7 | 1.00 |
| Yes | 53.1 | 0.89 (0.66, 1.20) | 70.8 | 1.48 (0.97, 2.25) |
| Had sexual partner(s) in the past year | | | | |
| No (ref) | 55.4 | 1.00 | 63.3 | 1.00 |
| Yes | 72.1 | 1.02 (0.76, 1.38) | 61.2 | 1.33 (0.90, 1.96) |
| Received Pap within the past 3 years | | | | |
| No (ref) | 60.4 | 1.00 | 48.1 | 1.00 |
| Yes | 67.1 | 1.04 (0.68, 1.57) | 63.2 | 1.64 (0.98, 2.77) |
| Had hysterectomy | 73.5 | 1.42 (0.78, 2.60) | 54.0 | 1.30 (0.63, 2.67) |
| HIV testing in the past 2 years | | | | |
| No (ref) | 67.0 | 1.00 | 52.5 | 1.00 |
| Yes | 65.6 | 1.29 (0.95, 1.75) | 73.5 | 1.60 (1.11, 2.29) |

Note: Boldface indicates significance.

^aData regarding acceptance (intention to get vaccinated) were available only for women who had heard of the HPV vaccine but had not received it.

^bMutually adjusted for all variables listed in the table

^c82% (147 of 180) of this group spoke Asian/Pacific Islander languages
HPV, human papillomavirus

The current study has several limitations. This landline telephone interview survey precluded participation by residents who exclusively use cellular telephones, a growing population including many young and low-income people. The survey's low response rate was another limitation. In addition, the vaccine has not been approved for use in women aged >26 years, and debate continues at the CDC's Advisory Committee on Immunization Practices on whether to recommend the vaccine for older women. Last, the findings may not be generalizable to other populations.

Conclusion

This large population-based survey among a diverse group of women reveals important disparities in HPV

vaccine awareness and intention to undergo vaccination. Culturally and linguistically competent educational campaigns about HPV vaccination are warranted, and should target high-risk populations.

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