



Research Letter

Rates of genital warts after the age of 26: An analysis of the National Health and Nutrition Examination Survey

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Dear Editors,

In 2018, the U.S. Food and Drug Administration extended the age approval for the human papillomavirus vaccine from 9 to 26 years to 9 to 45 years (McSeveney, 2018). An expanded approval may prevent genital warts in previously unvaccinated individuals. To understand which groups are at the greatest risk of genital warts and how often they first occur between the ages of 27 through 45, data from the 2013–2014 and 2015–2016 National Health and Nutrition Examination Survey (NHANES) were analyzed.

NHANES is a nationally representative survey conducted by the U.S. Centers for Disease Control and Prevention. The survey consists of approximately 5000 patients of all ages from 15 different sites over a 12-month period. The study design includes a representative sample of these groups by age, sex, and income level (National Center for Health Statistics, 2020). The inclusion criteria were at least one lifetime sexual partner and answering “yes” or “no” when asked if they have been diagnosed with genital warts by a health care provider. If “yes,” NHANES asked the patient’s age when first diagnosed. Only individuals age 18 to 59 years were asked about genital warts.

Demographic characteristics between individuals with and without a previous diagnosis of genital warts were compared. Within those diagnosed with genital warts, age at initial diagnosis was categorized and summarized overall and by sex and race/ethnicity. All analyses were weighted based on the NHANES sampling design in R (R-Core Team, Auckland, New Zealand). Due to NHANES’s sampling design, data are reported as a weighted percentage rather than an exact numerical value.

Approximately 4.4% of individuals have been diagnosed with genital warts (Table 1). Rates were higher in certain demographic groups, notably whites ($p < .001$), women ($p < .001$), earlier age of sexual debut ($p < .001$), increasing number of sexual partners ($p < .001$), and higher levels of education ($p = .046$). Individuals with higher levels of education may have greater rates of wart diagnosis due to higher income and thus greater access to health

care. Similarly, women have higher rates than men, but this may be attributable to higher health care utilization among women (Fleischer et al., 2001).

Among all initial cases of genital warts, 66.7% occur by age 26, 29.2% occur between 27 and 45, and 4.1% occur at or after 46

Table 1

Demographics of individuals with or without a previous diagnosis of genital warts.

Demographic	No warts ^a	Warts ^a	p-value
Overall, %	95.6	4.4	
Sex, %			
Male	50.1	30.0	<.001
Female	49.9	70.0	
Age, mean (standard deviation), y	39.58 (11.65)	44.91 (9.34)	<.001
Race/ethnicity, %			
White	62.3	77.3	<.001
Black	12.0	8.1	
Asian	4.9	1.5	
Hispanic	17.2	9.6	
Multiple	3.6	3.5	
Education, %			
High school or less	34.0	23.8	.046
Some college	33.5	40.7	
College graduate	32.5	35.5	
Country of birth, %			
United States	82.0	91.9	.004
Other	18.0	8.1	
Age of sexual debut, mean (standard deviation), y	17.45 (3.69)	16.35 (2.73)	<.001
No. of lifetime sexual partners, %			
1 partner	14.0	2.8	<.001
2–5 partners	33.6	21.8	
6–14 partners	29.3	27.6	
15+ partners	23.0	47.8	
Same-sex partners, %			
≥2	6.0	9.5	.137
<2	94.0	90.5	
≥1 HPV vaccinations, %			
HPV vaccination	7.9	6.2	.47
No HPV vaccination	92.1	93.8	

HPV, human papillomavirus.

^a Unweighted raw values: no warts (n = 6436) and warts (n = 236).

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Table 2

Age range at time of first diagnosis with genital warts.

Demographic	Age		
	<26 years	27–45 years	≥46 years
All, %	66.7	29.2	4.1
Sex, %			
Male	64.5	34.3	1.2
Female	67.7	27.0	5.4
Race/ethnicity, %			
Asian	61.3	33.4	5.2
Black	79.4	20.6	0.0
Hispanic	23.2	53.5	23.3
White	66.8	29.1	4.1
Other	67.3	30.4	2.3

(Table 2). When categorizing by sex and race/ethnicity, the percentage of initial cases in the age group of 27 to 45 years are 27.0% women, 34.3% men, 29.1% white, 20.6% black, 53.5% Hispanic, 33.4% Asian, and 30.4% other/multiple races. These data demonstrate that one-third of initial genital wart cases occur after the age of 26 years. Men, Hispanics, and Asians have notably high rates of initial cases of genital warts between the ages of 27 and 45. Presumably, these individuals are more likely to benefit from expanded utilization of the vaccine past the age of 26.

Limitations of these data include that NHANES only asked individuals if they had been diagnosed at least once with genital warts. Thus, we do not know which individuals may have had multiple cases of warts, and the data may suffer from a self-reporting bias. Additionally, rates of genital warts may be underreported in NHANES because only cases diagnosed by a health care profes-

sional were included. Ultimately, one-third of initial genital wart cases occur after the age of 26. Therefore, increased utilization of the vaccine in persons older than 26 has the potential to markedly decrease rates of genital warts.

Conflicts of interest

None.

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None.

Study Approval

The author(s) confirm that any aspect of the work covered in this manuscript that has involved human patients has been conducted with the ethical approval of all relevant bodies.

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