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Factors associated with time since last HIV test among persons at high risk for HIV infection, National Survey of Family Growth, 2006–2010

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Abstract

The Centers for Disease Control and Prevention (CDC) recommends annual HIV screening for persons at high risk for HIV infection. We assessed the testing history and factors associated with recent testing (tested in the last 12 months) among persons at high risk for HIV infection. We analyzed 2006–2010 National Survey of Family Growth data and classified respondents aged 15–44 who reported a sexual or drug-use risk behavior in the past year as ‘high-risk’. Logistic regression models estimated prevalence ratios assessing the association between demographic and health-related factors and having recently tested for HIV compared with never been tested. Among high-risk men, 29.3% had recently tested for HIV, 30.7% tested more than 12 months ago, and

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40.0% had never been tested. Among high-risk women, 38.0% had recently tested, 36.9% tested more than 12 months ago, and 26.1% had never been tested. Compared with men who were aged 15–19, white, heterosexual, and had not recently visited a doctor, men who were aged 40–44, black/African American, homosexual/gay or bisexual, and had visited a doctor in the past year were more likely to have recently tested. Compared with women who were white, had not recently visited a doctor, and had never been pregnant, women more likely to have recently tested were black/African American, had visited a doctor in the past year, and had been pregnant. Approximately two-thirds of high-risk men and women had not been recently tested for HIV. CDC recommendations for annual screening are not being implemented for the majority of persons at risk.

Keywords

human immunodeficiency virus (HIV); HIV testing; HIV prevention

Introduction

HIV testing is the entry point to the HIV continuum of care that includes diagnosis, engagement in HIV medical care, and antiretroviral therapy to achieve viral suppression. Approximately 1.2 million persons aged 13 years and older in 2011 were living with HIV in the United States, yet, approximately 168,300 (14%) were unaware they were living with HIV.[1] In the '*Revised recommendations for HIV testing of adults, adolescents, and pregnant women in health care settings*' (referred to as revised recommendations) released in 2006, the Centers for Disease Control and Prevention (CDC) recommends that health care providers test all persons likely to be at high risk for HIV at least annually.[2] Persons likely to be at high risk include injection drug users and their sex partners; persons who exchange sex for money or drugs; sex partners of HIV-infected persons; gay, bisexual and other men who have sex with men (collectively referred to as MSM) or heterosexual persons who themselves or whose sex partners have had more than one sex partner since their most recent HIV test, and persons who have been diagnosed with a sexually transmitted disease (STD).[2,3] In addition, persons who use non-injectable drugs, such as crack cocaine and methamphetamine, are also considered at increased risk for HIV infection.[4]

The groups accounting for the highest percentages living with undiagnosed HIV infection are men whose infection is attributable to male-to-male sexual contact (62%) (e.g., MSM) and women whose infection is attributable to heterosexual contact with an HIV-positive person or with a person at high risk for HIV infection (17%).[5] One goal of the National HIV/AIDS Strategy is to diagnose 90% of persons living with HIV infection by 2015.[6] Annual HIV screening for persons at greatest risk for HIV infection will help to achieve this goal.

The purpose of this analysis is to identify demographic and health-related factors independently associated with testing for HIV among persons at high risk for HIV infection in the United States. We classified high-risk groups based on CDC's recommendations for who should be screened for HIV annually[2,3] and assess differences in three groups: high-risk

persons who tested in the last 12 months, high-risk persons who tested more than 12 months ago, and high-risk persons who have never tested. Understanding differences between these three groups might inform HIV testing programs and how to reduce barriers and increase testing among persons at greatest risk of HIV infection. We have hypothesized that those who have been tested in the past, but not in the last year, are likely to differ from those who have never been tested and may require different interventions to increase annual testing. Previous studies have identified barriers to HIV testing and diagnosis, such as access to care, provider knowledge of recommendations, stigma, and perception of risk, among specific groups of persons at high risk for HIV infection, but few have identified a collective group of persons at high risk for HIV infection nationally.[7–14] The studies that did describe persons in the United States at high risk for HIV and their testing history did not focus on the factors independently associated with testing.[13,14] In addition, our analysis expands on the definition of high-risk to more closely align with the groups for which CDC recommends annual screening.

Methods

Data source

The National Survey of Family Growth (NSFG) is a nationally representative, multistage area probability sample of non-institutionalized men and women aged 15–44 years in the US household population. The 2006–2010 NSFG, conducted on a continuous 5-year cycle, was based on 22,682 face-to-face interviews: 10,403 men and 12,279 women. The response rate for the 2006–2010 NSFG was 77% overall; 75% for men and 78% for women. Most of the NSFG, including the HIV test questions, was collected using computer-assisted personal interviewing (CAPI); the sexual and drug-use risk variables were collected using audio computer-assisted self-interviewing (ACASI), which increases complete reporting of sensitive sexual and drug-use behaviors.[13] Additional details on NSFG are described elsewhere.[15]

Sample identification, HIV testing outcome, and independent characteristics

For this analysis, we classified persons as high risk for HIV infection and examined whether those persons had tested for HIV. Using a slightly modified method described by Chandra et al. (2012)[13], respondents were classified as high risk for HIV based on CDC's recommendations for who should be screened annually, if they reported at least one of the following sexual or drug-use risk factors in the past 12 months: 1) sexual risk factors: men who have had sex with a man; three or more opposite-sex sexual partners (versus five or more opposite-sex sexual partners used in Chandra et al.), exchanged sex for money or drugs, female with a male partner who had sex with other men, sex with illicit-drug-injecting partner, sex with an HIV-positive partner or treated for an STD other than HIV, and 2) drug-use risk factors: illicit-drug injection use, crack cocaine use, or crystal methamphetamine use.[2,3] Three or more opposite-sex sexual partners is a proxy for persons "who themselves or whose sex partners have had more than one sex partner since their most recent HIV test."[2] The risk of acquiring HIV infection increases when there is greater HIV prevalence among potential sex partners. We chose three or more sexual partners to include

persons at high risk who may be excluded with the higher requirement of five or more sexual partners.

NSFG respondents are first asked about blood donation and then asked the HIV test question based on their response to the blood donation question: "*(Apart from testing that may have been done with your blood donations,) Have you ever had your blood tested for HIV, the virus that causes AIDS?*" The responses to these questions were combined to yield the overall HIV testing responses: never tested for HIV in any context, only tested for HIV as part of blood donation, and ever tested for HIV outside of blood donation. Only an HIV test outside of blood donation was considered as having tested for HIV for this analysis. Based on the overall HIV testing responses and date of last test, HIV testing history was categorized as "recently tested" (i.e., tested in the last 12 months), "tested more than 12 months ago", or "never tested". Among persons who reported engaging in at least one sexual or drug-use risk behavior (i.e., high-risk men and women), 96.4% (3,380/3,507) had a valid response to the HIV test question and reported a valid date (i.e., month and year equal to or prior to the interview date).

Factors associated with HIV testing history, and available in NSFG, were selected as independent variables including: age, race/ethnicity, marital status, federal poverty level, sexual orientation, health insurance status (for those aged 20–44 years), visited doctor in the past year, pregnancy history (women only), and receipt of advice for HIV testing from doctor (asked of men only).[14] Federal poverty level is based on family income and family size.

Data analysis

We report the estimated numbers and percentages of US persons aged 15–44 years living in households who reported at least one sexual or drug-use risk behavior to identify high-risk men and women and the estimated percentages recently tested, tested more than 12 months ago, and never tested by demographic and health-related factors. SAS version 9.3 was used to weight data and account for the complex survey design.[16] We used SUDAAN version 10.0.1 to calculate unadjusted and adjusted prevalence ratios (PRs/APRS) and 95% confidence intervals (95% CIs) using logistic regression models for high-risk men and women. Separate models were developed comparing high-risk persons recently tested for HIV or high-risk persons tested more than 12 months ago to those never tested. Never tested is used as the reference group compared with the other two groups because they likely differ the most. Manual backwards elimination was used to develop the final multivariable logistic regression models including only variables significant at $p<0.05$. This approach is valuable in helping to methodically identify the best model while considering collinearity, confounding, and precision.[17] Chi-square test was used to assess the association between receiving advice to get an HIV test and recently testing for HIV among high-risk men.

Results

Sexual and drug-use risk behaviors

Overall, an estimated 12.6% of respondents, 15.6 million US persons, reported at least one sexual or drug-use risk behavior in the past 12 months (Table 1). Among the 10,403 male respondents in NSFG, an estimated 14.7%, 9 million US males, had at least one sexual or drug-use risk behavior in the past 12 months. An estimated 8.7% of men had three or more opposite sex partners, 2.6% were treated for an STD other than HIV, and 2.1% had sex with at least one man (categories are not mutually exclusive). Among the 12,279 female respondents in NSFG, an estimated 10.5%, 6.5 million US females, had at least one sexual or drug-use risk behavior in the past 12 months. An estimated 4.8% of women had three or more opposite sex partners, 4.1% were treated for a STD other than HIV, and 1.4% had sex with a man who had sex with other men (categories are not mutually exclusive). Prevalence of other sexual or drug-use risk behaviors was low (Table 1).

HIV testing among high-risk men

Overall, 29.3% of high-risk men had recently tested for HIV, 30.7% had tested more than 12 months ago, and 40.0% had never been tested for HIV (Table 2). When adjusting for covariates, young high-risk men aged 15–19 years were less likely to have recently tested than those aged 40–44 years (APR=0.65, 95% CI=0.44–0.96). Black/African American (hereafter referred to as black) men were more likely to have recently tested compared with white men (APR=1.43, 95% CI=1.19–1.73); as were men who identified as homosexual or gay or bisexual compared with men who identified as heterosexual or straight (APR=1.94, 95% CI=1.59–2.36 and APR=1.70, 95% CI=1.37–2.10, respectively); and men who had visited a doctor in the past year compared with men without a visit (APR=2.83, 95% CI=2.22–3.61). Marital status, poverty level, and insurance status were not statistically significant and not included in the final model.

The characteristics of high-risk men with significant APRs for recent testing were similar to the characteristics of high-risk men with significant APRs for testing more than 12 months ago: men aged 40–44 years compared with men aged 15–19 years, blacks compared with whites, homosexual/gay sexual orientation compared with heterosexual/straight sexual orientation, and visited a doctor in the past year compared with no visit (Table 2). Marital status, poverty level, and insurance status were not statistically significant and not included in the final model.

Among high-risk men, 47% visited a doctor in the past year. Among those who visited a doctor, 45% received advice to get an HIV test (data not shown). Among those who got advice, 65% had recently tested for HIV compared with 37% of those who did not get advice ($p<0.01$).

HIV testing among high-risk women

Overall, 38.0% of high-risk women had recently tested for HIV, 36.9% had tested more than 12 months ago, and 26.1% had never been tested for HIV (Table 3). When adjusting for covariates, black women were more likely to have recently tested compared with white

women (APR=1.39, 95% CI=1.22–1.59); as were women who had visited a doctor in the past year compared with women without a visit (APR=1.82, 95% CI=1.36–2.43); and women who were currently or previously pregnant compared with women who were never pregnant (APR=2.06, 95% CI=1.65–2.56 and APR=1.83, 95% CI=1.52–2.20, respectively). Age, marital status, poverty level, sexual orientation, and insurance status were not statistically significant and not included in the final model.

The characteristics of high-risk women with significant APRs for recent testing were similar to the characteristics of high-risk women with significant APRs for testing more than 12 months ago: blacks compared with whites, visited a doctor in the past year compared to no visit, and currently or previously pregnant compared with never pregnant. In addition, women aged 15–19 years compared with women aged 40–44 years were less likely to have tested more than 12 months ago (APR=0.52, 95% CI=0.36–0.75) (Table 3). Marital status, poverty level, sexual orientation, and insurance status were not statistically significant and not included in the final model.

Discussion

During 2006–2010, an estimated 14.7% (approximately 9.1 million) of men and 10.5% (approximately 6.5 million) of women reported at least one sexual or drug-use risk behavior for HIV infection. The largest percentage of men and women reported three or more opposite-sex sex partners, followed by treatment for an STD. Among these high-risk men, less than one-third had recently tested for HIV as recommended and 40% had never been tested. Among these high-risk women, nearly 40% had recently tested as recommended; still 26% had never been tested. Interestingly, the factors associated with recent testing were similar to the factors associated with testing more than 12 months ago, indicating that the same groups of high-risk persons who are not testing annually have also never been tested. Although all persons identified as at high risk for HIV infection should be screened annually, these findings highlight the greatest gaps and need for improvement. Innovative program strategies are needed to increase annual HIV screening for high-risk persons.

Compared with our estimate of the percentage of men (14.7%) and women (10.5%) at high risk for HIV infection, Chandra et al (2012) estimated that 10% of men and 8% of women during 2006–2010 reported at least one of the HIV risk-related behaviors they examined.[13] This study also found that 34% of men and 43% of women aged 15–44 years at high-risk for HIV infection were recently tested compared with our estimates of 29.3% of men and 38.0% of women.[13] Other studies estimating the percentage of persons at risk for HIV infection in the United States are limited.[18,19] A previous meta-analysis estimated that 2.9% of men had sex with men in the past 12 months, similar to our estimate of 2.1%[18] and another meta-analysis estimated that 0.3% of persons injected drugs in the past year, which is equivalent to our estimate of 0.3%.[19] However, the study by Chandra et al (2012) was the first and only other study we found to identify a collective group of persons in the general U.S. population at risk for HIV infection based multiple risk behaviors for HIV.[13] We used the same variables to identify high-risk persons with the exception of the number of opposite-sex sexual partners. The exact variable to measure the CDC recommendation that persons with more than one partner since their last HIV test should test annually is not available in NSFG;

the number of opposite-sex partners is used as a proxy. We chose a lower bar as the cut-off to include persons at high risk who may be excluded with the higher requirement of five or more sexual partners. Although the number of sexual partners varied, both studies indicate a large gap in annual HIV testing; based on our results approximately 10.4 million high-risk persons in the United States were not tested annually as recommended.

Recent testing among high-risk women was most strongly associated with pregnancy history. Only 30% of high-risk, never-pregnant women were recently tested compared with 65% of currently pregnant women. Prenatal HIV testing has contributed substantially to diagnosing HIV among pregnant women, and led to reduced perinatal transmissions.[20,21] Routine HIV screening during clinic visits also effectively reaches non-pregnant women, suggesting that clinic visits should remain a focus to increase annual screening for non-pregnant, high-risk women.[22]

We found that black, high-risk men are more likely to be tested than white men. This is consistent with other studies that found higher testing rates and a higher perception of HIV risk among blacks than whites.[7,23,24] This finding may be influenced by public funding that has traditionally been used to target groups disproportionately affected by HIV.[25] For example, CDC funds health departments and community-based organizations to implement HIV prevention activities, including HIV testing for persons disproportionately affected by HIV (i.e., blacks/African Americans, Hispanics or Latinos, and MSM).[25] Despite higher testing rates and greater awareness of HIV, blacks continue to be disproportionately affected by HIV with HIV diagnosis rates nearly eight times as high as white men.[5] Despite higher testing rates, we found that 25% of black men had never been tested. A previous study found that among persons recently diagnosed with HIV infection, by race/ethnicity, blacks had the highest percentage (44%) of persons with no previous negative HIV test before their diagnosis.[26] Additional actions are needed to reach black men who have never been tested and increase the percentage aware of their HIV infection.

MSM are also disproportionately affected by HIV; 62% of persons living with undiagnosed HIV infection in 2011 were men whose infection is attributed to male-to-male sexual contact.[1] We found that less than 40% of men who identified as homosexual/gay tested recently. Our findings differ from those based on the National HIV Behavioral Surveillance System (NHBS), which found that 67% of MSM with negative or unknown HIV status had an HIV test in the past 12 months.[27] NHBS data are from MSM recruited at venues in large cities, while NSFG is nationally representative. HIV testing programs appear to be having more success in reaching MSM in urban areas, but increased efforts are needed to reach MSM in non-urban areas. The differences in these findings highlight areas for improvement in HIV testing services for MSM.

Young high-risk men aged 15–19 years were significantly less likely to have recently tested and nearly 70% have never been tested. Approximately 50% of young high-risk women have never been tested. Young adults are the least likely to be aware of their infection and, therefore, at greatest risk of missing the opportunity for HIV care and treatment and reducing the risk of transmitting HIV.[1] Social media is an innovative tool that can increase HIV testing among this population using home-based HIV testing.[28]

HIV testing in clinical settings and provider recommendations for testing are important factors for increasing HIV screening.[8,9,12] High-risk women and men in our analysis who visited a doctor in the past year were 1.8 times and 2.8 times, respectively, as likely to have recently tested compared with those with no doctor visit. Further, among men who visited a doctor in the past year, 45% received advice to get an HIV test and 65% of those who got advice were recently tested compared with 37% who did not get advice. These results highlight the important role health care providers can have in influencing their patients' behaviors. Clinical settings that implement routine screening eliminate the requirement for patients to disclose HIV risk behaviors to their provider. Health care providers can identify ways to increase interactions with men to facilitate annual screening opportunities. In addition to clinic-based testing, community-based testing will continue to be an important strategy to reach men unaware of their HIV infection and provide HIV prevention interventions.[29,30]

This study is subject to at least four limitations. First, NSFG data are self-reported and subject to recall bias and potential underreporting of sensitive information such as HIV testing and sexual and drug-use risk behaviors because of social desirability bias. Second, NSFG excludes active military personnel and those who live outside of households (e.g., persons who are incarcerated, in long-term care institutions, or homeless). These groups might have different rates of sexual and drug-use risk behaviors and HIV testing than persons in households. Third, the HIV test question asks about having blood tested for HIV. Respondents may not include oral fluid testing, resulting in an underestimation of persons tested for HIV. Finally, not all persons at risk for HIV may have been captured with our definition for high-risk persons, which might underestimate the number of people needing annual screening. In contrast, persons who are living with HIV infection and have previously been diagnosed do not need testing but could not be identified and excluded from the analysis, which might overestimate the number of people needing annual screening.

Our results indicate there is a need to increase annual HIV testing among persons at high risk for HIV infection. The National HIV/AIDS Strategy has set a goal to increase the percentage of persons living with HIV who are aware of their HIV infection to 90% by 2015. The low percentage of annual HIV testing among high-risk persons, especially males and young adults suggest this goal may not be attained. All opportunities to screen persons at high risk of HIV infection need to be optimized.

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Table 1

Sexual and drug-use risk behaviors used to identify high-risk men and high-risk women aged 15–44 years in the United States: NSFG 2006–2010

HIV risk-related behavior in the past 12 months	Men % (n)	Women % (n)	Total % (n)
1. Male to male sex	2.1 (1,273,602)	NA	NA
2. Three or more opposite-sex sex partners	8.7 (5,402,512)	4.8 (2,959,388)	6.8 (8,361,900)
3. Sex in exchange for money or drugs	1.3 (791,123)	0.7 (461,601)	1.0 (1,252,724)
4. Women with male partner who had sex with other men	NA	1.4 (861,517)	NA
5. Sex partner who injects illicit drugs	0.7 (442,660)	0.8 (467,268)	0.7 (909,928)
6. HIV-positive sex partner	0.1 (86,008)	0.1 (36,493)	0.1 (122,501)
7. Treatment for a STD	2.6 (1,580,387)	4.1 (2,489,907)	3.3 (4,070,294)
8. Illicit drug injection	0.3 (204,467)	0.2 (110,114)	0.3 (314,581)
9. Crack cocaine use	0.8 (514,296)	0.7 (410,617)	0.8 (924,913)
10. Crystal methamphetamine use	1.1 (688,656)	0.8 (465,139)	0.9 (1,153,795)
At least one HIV risk-related behaviors (1–10)	**14.7 (9,092,683)**	**10.5 (6,455,995)**	**12.6 (15,548,678)**

Note. Percentage and number (n) are weighted to represent all US men or women aged 15–44 years. NA not applicable; NSFG National Survey of Family Growth; STD sexually transmitted disease. NSFG had a total of 22,682 respondents; 10,403 male and 12,279 female.

Table 2

Timing of and factors associated with HIV testing[a] among high-risk men (n=9,092,683): NSFG 2006–2010

	% tested			Recently tested[b]						Tested >12 months					
	Recently	>12 months	Never	PR	95%	CI	APR	95%	CI	PR	95%	CI	APR	CI	95%
Total	29.3 (n=2,664,115)	30.7 (n=2,787,400)	40.0 (n=3,641,168)												
Age, years															
15 – 19	24.3	9.4	66.3	0.74	0.47	1.17	0.65	0.44	0.96	0.25	0.16	0.39	0.21	0.14	0.32
20 – 29	36.6	25.0	38.3	1.35	0.94	1.94	1.34	0.96	1.89	0.70	0.52	0.94	0.72	0.53	0.97
30 – 39	24.7	44.2	31.2	1.25	0.87	1.79	1.26	0.88	1.82	1.02	0.80	1.31	1.02	0.78	1.35
40 – 44	19.4	48.1	32.5	Reference			Reference			Reference			Reference		
Race/ethnicity															
Black/African American	40.7	34.5	24.8	1.45	1.19	1.76	1.43	1.19	1.73	1.51	1.30	1.76	1.54	1.32	1.78
Hispanic/Latino	32.2	24.6	43.2	1.14	0.88	1.47	1.14	0.91	1.43	0.95	0.76	1.18	1.01	0.82	1.25
Other	7.5	42.3	50.2	0.31	0.14	0.68	0.29	0.13	0.64	1.03	0.70	1.51	1.02	0.68	1.54
White	26.2	30.4	43.5	Reference			Reference			Reference			Reference		
Marital Status															
Cohabitating	33.8	38.7	27.5	1.08	0.73	1.59				1.38	0.95	2.01			
Unmarried/not cohabiting	29.1	28.9	41.9	0.90	0.67	1.21				1.07	0.77	1.49			
Married	26.4	33.2	40.3	Reference						Reference					
Federal poverty level, %															
0–99	28.7	30.2	41.1	0.87	0.65	1.15				0.85	0.66	1.11			
100–199	27.8	30.8	41.4	0.89	0.69	1.16				0.79	0.61	1.03			
200–399	28.7	26.2	45.2	0.96	0.76	1.20				0.80	0.64	0.99			
≥400	31.9	37.2	30.9	Reference						Reference					
Sexual orientation															
Homosexual	36.8	48.5	14.7	1.97	1.63	2.39	1.94	1.59	2.36	1.75	1.43	2.15	1.78	1.48	2.15
Bisexual	50.3	22.2	27.5	1.73	1.40	2.13	1.70	1.37	2.10	1.23	0.85	1.78	1.19	0.81	1.75
Heterosexual	27.9	28.9	43.2	Reference			Reference			Reference			Reference		
Insured[c]															
No	31.2	33.7	35.1	1.08	0.87	1.36				1.15	0.96	1.39			

	% tested			Recently tested[b]						Tested >12 months					
	Recently	>12 months	Never	PR	95%	CI	APR	95%	CI	PR	95%	CI	APR	CI	95%
Yes	28.0	28.6	43.5	Reference						Reference					
Visited doctor in past year															
Yes	47.3	25.7	27.0	2.81	2.20	3.59	2.83	2.22	3.61	1.37	1.12	1.67	1.37	1.12	1.67
No	14.6	34.7	50.7	Reference			Reference			Reference			Reference		

Note: Percentages tested were weighted to represent all US men aged 15–44 years, not adjusted for covariates. Independent variables not significantly associated with HIV testing at p<0.05 were not included in the final adjusted logistic regression models. HIV human immunodeficiency virus; PR prevalence ratio; APR adjusted prevalence ratio; 95% CI 95% confidence interval.

[a] Excludes tests for blood donation

[b] Tested in the last 12 months

[c] Limited to ages 20–44 years

Table 3

Timing of and factors associated with HIV testing[a] among high-risk women (n=6,455,995): NSFG 2006–2010

	% tested			Recently tested[b]						Tested >12 months					
	Recently	>12 months	Never	PR	95%	CI	APR	95%	CI	PR	95%	CI	APR	CI	95%
Total	38.0 (n=2,440,566)	36.9 (n=2,334,644)	26.1 (n=1,680,785)												
Age, years															
15 – 19	36.8	12.4	50.7	1.03	0.75	1.41				0.54	0.35	0.82	0.52	0.36	0.75
20 – 29	45.1	32.4	22.5	1.19	0.88	1.61				0.88	0.69	1.11	0.89	0.71	1.12
30 – 39	33.5	50.5	16.0	1.10	0.80	1.52				0.96	0.76	1.22	0.96	.075	1.23
40 – 44	22.1	62.2	15.7	Reference						Reference			Reference		
Race/ethnicity															
Black/African American	55.5	32.4	12.1	1.35	1.17	1.56	1.39	1.22	1.59	1.25	1.07	1.47	1.22	1.05	1.43
Hispanic/Latino	32.0	37.6	30.4	0.92	0.73	1.16	0.97	0.78	1.20	0.96	0.77	1.20	0.97	0.78	1.20
Other	38.1	22.1	39.8	0.90	0.66	1.22	0.91	0.64	1.29	0.68	0.45	1.05	0.58	0.34	0.97
White	33.5	38.4	28.2	Reference			Reference			Reference			Reference		
Marital Status															
Cohabitating	40.5	39.7	19.8	1.21	0.85	1.73				0.97	0.73	1.29			
Unmarried/not cohabiting	40.0	30.5	29.5	1.19	0.93	1.53				1.06	0.86	1.30			
Married	28.6	53.3	18.1	Reference						Reference					
Federal poverty level, %															
0–99	43.2	32.9	23.9	0.97	0.81	1.17				0.85	0.70	1.03			
100–199	35.6	37.9	26.5	1.01	0.83	1.24				0.92	0.75	1.12			
200–399	36.2	36.6	27.2	0.96	0.79	1.17				0.87	0.73	1.04			
≥400	33.2	39.3	27.5	Reference						Reference					
Sexual orientation															
Homosexual	52.0	24.9	26.4	1.32	1.03	1.70				1.25	0.91	1.71			
Bisexual	45.5	32.3	22.3	1.12	0.92	1.36				1.17	0.98	1.40			
Heterosexual	36.6	37.0	26.4	Reference						Reference					
Insured[c]															
No	39.6	45.2	15.2	1.15	0.98	1.37				1.16	0.99	1.35			
Yes	37.2	32.5	30.3	Reference						Reference					

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	% tested			Recently tested[b]						Tested >12 months					
	Recently	>12 months	Never	PR	95%	CI	APR	95%	CI	PR	95%	CI	APR	CI	95%
Visited doctor in past year															
Yes	42.8	35.1	22.2	1.76	1.30	2.37	1.82	1.36	2.43	1.30	1.05	1.59	1.22	1.02	1.46
No	19.9	40.1	40.0	Reference			Reference			Reference			Reference		
History of Pregnanacy															
Currently pregnant	64.1	28.6	7.3	2.08	1.68	2.57	2.06	1.65	2.56	1.95	1.42	2.68	1.93	1.39	2.69
Previously pregnant	40.7	47.5	11.7	1.85	1.54	2.20	1.83	1.52	2.20	2.00	1.59	2.51	2.02	1.62	2.54
Never pregnant	30.2	20.9	48.9	Reference			Reference			Reference			Reference		

Note: Percentages tested were weighted to represent all US women aged 15–44 years, not adjusted for covariates. Independent variables not significantly associated with HIV testing at $p<0.05$ were not included in the final adjusted logistic regression models. HIV human immunodeficiency virus; PR prevalence ratio; APR adjusted prevalence ratio; 95% CI 95% confidence interval.

[a] Excludes tests for blood donation

[b] Tested in the last 12 months

[c] Limited to ages 20–44 years

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