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Low HIV testing rates among US women who report anal sex and other HIV sexual risk behaviors, 2011–2015

Mary E. Evans, MD, MPH,
Guoyu Tao, PhD,
Sarah E. Porter, MPH,
Simone C. Gray, PhD,
Ya-lin A. Huang, PhD,
Karen W. Hoover, MD, MPH

Division of HIV/AIDS Prevention, National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention (Drs Evans, Gray, Huang, and Hoover and Ms Porter), and Epidemic Intelligence Service, Office of Workforce and Career Development (Dr Evans), Division of STD Prevention, National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention (Dr Tao), Centers for Disease Control and Prevention, Atlanta, GA.

Abstract

OBJECTIVE: In 2016, 19% of HIV diagnoses were in women. About 40% of HIV infections in women aged 18–34 years have been attributed to anal sex, suggesting that women who report high risk behaviors such as anal sex might benefit from HIV testing and prevention with preexposure prophylaxis (PrEP). In this analysis, we estimated HIV testing rates among women who reported anal sex.

STUDY DESIGN: We analyzed data from the 2011–2015 National Survey of Family Growth to estimate the proportion of sexually active, nonpregnant US women aged 15–44 years who had an HIV test within the past year, stratified by those who reported anal sex and other risk factors, including ≥2 sexual partners, condomless sex with a new partner or multiple partners, gonorrhea in the past year, or any history of syphilis.

RESULTS: Overall, 7.9 million of 42.4 million sexually active, nonpregnant US women (18.7%) reported an HIV test within the past year. Among 42.4 million sexually active women, 9.0 million (20.1%) reported they had anal sex in the past year. Among these 9.0 million women, 19.2% reported that their providers asked about their type of intercourse, and 20.1% reported an HIV test within the past year. Overall, HIV testing was higher among women who reported anal sex and reported that their providers asked about type of sex than those whose provider did not ask (37.8%

Corresponding author: Mary Evans, MD, MPH. lxi8@cdc.gov.
Present address for Dr Gray: Division of Cancer Prevention and Control, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention, Atlanta, GA.
Present address for Ms Porter: Center for Global Health, Division of Global HIV and TB, Durban, South Africa.

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vs 15.9%; $P < .001$). HIV testing in the past year was higher for women with other risk behaviors compared with anal sex, ranging from 35.8% to 47.2%.

CONCLUSION: Overall, HIV testing rates within the past year were low among women with sexual behaviors that increase their risk of acquiring HIV and especially low among those who reported anal sex. Early detection and treatment of HIV, and HIV prevention with PrEP, are effective health services that protect women's health and well-being but that can be offered only based on HIV testing results. Women's health care providers are uniquely poised to assess risk for acquiring HIV, including taking a sexual history that asks about anal sex, and performing HIV testing to identify women who need HIV treatment or might benefit from PrEP.

Keywords

anal intercourse; anal sex; HIV; HIV testing; preexposure prophylaxis; women

In 2016, more than 7500 women in the United States were diagnosed with an HIV infection.[1] The Centers for Disease Control and Prevention recommends annual HIV testing of women at high risk for HIV including persons who inject drugs and their sex partners, persons who exchange sex for drugs or money, sex partners of persons living with HIV, and persons who themselves or whose partners have had more than one sex partner since the last negative HIV test.[2] HIV testing is a critical intervention to identify those who are HIV positive and require linkage to care and to identify those who are HIV negative and require an assessment of eligibility for HIV prevention with preexposure prophylaxis (PrEP).[2,3]

Early diagnosis and initiation of antiretroviral treatment for women with a positive HIV test, with the goal of HIV viral suppression, can preserve immune function and prevent opportunistic infections[4] and prevent transmission of HIV to sexual or injection drug partners.[5] PrEP is a highly effective biomedical HIV prevention intervention that consists of a single daily pill of 2 coformulated antiretroviral drugs, tenofovir disoproxil fumarate and emtricitabine. It has been estimated that 468,000 US women aged 18–44 years had clinical indications for HIV prevention with PrEP in 2015.[6]

Condomless anal sex is the riskiest sexual behavior for HIV acquisition.[7] It was estimated that about 40% of HIV infections in women aged 18–34 years can be attributed to anal sex[8]. At-risk women can be identified by asking about a history of anal sex and other sexual risk behaviors during a clinical encounter. Taking a sexual history can be uncomfortable for both health care providers and women but is essential to identify women who would benefit from an annual HIV test.

It is important to understand sexual history taking and HIV testing practices of women's health care providers to ensure women's access to quality HIV prevention services. In this study, we assessed how frequently women who had anal sex were asked about it by their health care providers and how frequently they were tested for HIV. We also estimated HIV testing rates among women with other sexual risk behaviors.

Materials and Methods

We analyzed data from the 2011–2015 National Survey of Family Growth (NSFG), a nationally representative household survey of men and women aged 15–44 years.[9] The survey included questions about HIV testing, sexual behaviors, and history of sexually transmitted infections (STIs).[9] The 2011–2015 NSFGs were conducted in 2 cycles, one in 2011–2013 and the next in 2013–2015.[9] The survey response rate among women was 73.4% in 2011–2013 and 71.2% in 2013–2015.[9]

NSFG interviewers administered most survey questions using the computer-assisted personal interview method.[10] Sensitive questions about sexual behaviors and STI history were asked using the audio computer-assisted self-interviewing method to reduce participants' concerns about privacy and confidentiality.[10]

We restricted our analysis to sexually active women who were not pregnant at the time of the interview and did not have a recent pregnancy, defined as a pregnancy that was completed within a year prior to the interview. Pregnant women were excluded from the analysis because HIV testing is a routine part of prenatal care, and most pregnant women are tested for HIV.[11] We defined sexually active women as those who reported 1 or more male sexual partner(s) in the year prior to the interview.

The primary outcome in our study was report of an HIV test in the year prior to the interview among sexually active women who were not pregnant in the past year. We also estimated the proportion of women who ever had an HIV test except during a blood donation. We estimated the frequency of sexual behaviors that might increase a woman's risk of acquiring HIV and the frequency of HIV testing among women who reported these risk behaviors. Sexual risk behaviors included report of anal sex in the past year, ≥2 sexual partners in the past year, condomless sex at last sex with multiple or new sex partners, gonorrhea in the past year, or any history of syphilis.

Women who had anal sex were identified by asking, "Thinking of your male partners in the last year, with how many of them did you have anal sex?" The number of sex partners were queried with the question, "Thinking about the last 12 months, how many male sex partners have you had in those 12 months? Please count every partner, even those you had sex with only once in those 12 months." Condomless sex at last sex was identified by asking, "The very last time you had any type of sex—that is, vaginal intercourse or anal sex or oral sex—with a male partner, was a condom used?" Women who reported condomless sex were categorized as having an increased risk for acquiring HIV if they also reported ≥2 sex partners in the last year or if the first sexual encounter with their last sex partner was less than 3 months prior to the interview date.

Women who had gonorrhea were identified by asking, "In the last 12 months, have you ever been told by a doctor or other provider that you had gonorrhea?" Any history of syphilis was identified by asking, "At any time in your life, have you ever been told by a doctor or other medical care provider that you had syphilis?" We did not include women who reported chlamydia in the past year as a risk factor in our study because chlamydia is associated with a much lower risk for HIV acquisition compared with gonorrhea and syphilis.[12]

In the 2013–2015 cycle, women were asked 3 questions about whether their medical care provider conducted a sexual history during a health care encounter. Women were asked, “In the last 12 months, has a doctor or other medical care provider asked you about the types of sex you have, whether vaginal, oral, or anal?” They were also asked, “In the last 12 months, has a doctor or other medical care provider asked you about your number of sexual partners?” Finally, they were asked, “In the last 12 months, has a doctor or other medical care provider asked you about your use of condoms?” Among women who reported anal sex in the past year, we also estimated the proportion who were asked by their provider about the type of sex they had.

We conducted bivariate analyses to estimate the association between sexual risk factors for acquiring HIV and having an HIV test. We weighted results from all analyses to generate nationally representative estimates. All analyses were conducted using SAS 9.4 (SAS Institutes, Cary, NC), and we used SAS survey procedures to account for the complex sampling design of NSFG.

Results

Among 61.3 million US women aged 15–44 years, 42.4 million (69.1%) were sexually active and did not have a current or recent pregnancy. Demographic characteristics of these women are shown in Table 1. About 25.5% of the women were aged 15–24 years, 59.9% were white non-Hispanic, 84.9% resided in an urban community, and 29.1% were college graduates. Among all sexually active nonpregnant women, 66.3% reported ever having an HIV test.

Among 42.4 million sexually active nonpregnant women, 20% reported they had anal sex in the past year, 18.3% had ≥2 partners in the past year, and 12.2% reported condomless sex with an at-risk partner during last sex (Table 2). The prevalence of gonorrhea in the past year was 0.63%, and the prevalence of any history of syphilis was 0.41%. The HIV testing rate varied by sexual behavior (Figure 1).

Overall, 7.9 million of 42.4 million sexually active, nonpregnant US women (18.7%) reported an HIV test within the past year. There was no statistical difference among women who reported anal sex (1.7 million [19.2%]) than among those who did not report anal sex (6.2 million [18.6%, $P = .65$]). HIV testing was higher among women with gonorrhea in past year than those without gonorrhea (47.2% vs 18.5%, $P < .01$), among women with any history of syphilis than those without a history of syphilis (46.5% vs 18.6%, $P < .05$), among women with ≥2 partners than those with ≤1 partner (35.8% vs 14.9%, $P < .001$), and among women who reported condomless sex with at-risk partners than those who did not report at-risk partners (35.1% vs 16.4%, $P < .001$).

Despite the high proportions of women who reported sexual behavior that might increase their risk of acquiring HIV, only a small proportion of women in the 2013–2015 cycle reported being asked by their medical provider about type of intercourse (36.3%), condom use (32.2%), or number of sexual partners (31.3%) (Figure 2). Among 42.3 million sexually

active nonpregnant women whose medical provider asked about type of intercourse, 9.2 million (21.8%) reported anal sex in the past year.

Yet only 1.8 million of 9.2 million women who reported had anal sex in the past year (19.2%) also reported that a medical care provider asked about type of sex (Table 3). Furthermore, only 1.9 million (20.1%) of 9.2 million women who reported anal sex also reported having an HIV test. Among women who reported anal sex, a larger proportion who were asked by their medical care provider about anal sex were tested 0.7 million (37.8%) compared with those who were not asked 1.2 million (15.9%) ($P < .05$).

Comment

Anal sex can increase a woman's risk for acquiring HIV. In our study, women were more likely to report HIV testing if they also reported that a health care provider asked about their types of sexual behaviors. Unfortunately, health care providers ask too infrequently about sexual behaviors that can increase the risk of acquiring HIV, including women who had anal sex in the past year, which is the riskiest types of sex.[7,13]

For several reasons, women might not discuss their sexual behavior with their provider. Women might be especially reticent to discuss their history of anal sex because of the stigma associated with this behavior, or they might be unaware of its association with HIV transmission. One study found that 70% of adults incorrectly believed that vaginal sex had a greater risk of HIV transmission than anal sex.[14] Health care providers might not be comfortable with or skillful at taking a sexual history,[15–17] but a discussion about sexual behaviors including a history of anal sex can help providers to identify women who may be at higher risk for HIV infection and might benefit from annual HIV testing. A recent paper found that women who received a sexual risk assessment were more likely to receive an HIV or STI test, but this study did not exclude pregnant women.[13] Our study focused on women who reported high risk behavior, but we excluded pregnant women who likely received HIV testing as part of routine prenatal care.

The low frequency of HIV testing within the past year among women who reported anal sex is concerning. Anal sex is a common behavior that has increased over the past several years, with the proportion of US women aged 15–44 years ever engaging in anal sex increasing from 30% to 36% from 2002 to 2013[18,19] but is often underreported.[20–22] HIV transmission can occur during anal sex in both men and women because of the high density of CCR5-expressing CD4+ T cells in the anal mucosa.[23–25] Despite more efficient HIV transmission during anal sex compared with vaginal sex,[7] only a small proportions of women reported using condoms during anal sex,[26] and women reported using condoms less frequently during anal sex than during vaginal sex.[7,27] While HIV testing of women who report anal sex is not specifically recommended by the Centers for Disease Control and Prevention, health care providers might consider more frequent HIV testing for those who do report anal sex.[2,8]

Women who reported a history of gonorrhea in the past year or any history of syphilis had the highest rates of HIV testing, but women who reported anal sex did not have higher testing rates than women overall. This suggests that important HIV testing opportunities

are being missed either because this risk is not being assessed by health care providers or because some women might not have encounters with the health care system. Women with a history of an STI might be more likely to seek health care than other women, and their providers might rely on STI testing results in a woman's medical record to identify those who would benefit from an HIV test. Also, women may have received HIV testing as part of a clinical evaluation when they presented with STI symptoms.

HIV testing is necessary for early HIV diagnosis and linkage to care and to identify HIV-negative women who might be at substantial risk of acquiring an HIV infection[3,28] Universal opt-out HIV testing is an important prevention intervention that is easily implemented during routine primary care visits. Persons at high risk for HIV should be screened at least annually.[2] Prior to the availability of PrEP, risk-reduction counseling and the use of condoms were the only HIV prevention options. The recent availability of biomedical HIV prevention with PrEP allows women to have greater control of HIV prevention, without needing to negotiate condom use with male sex partners.

While not all woman reporting anal sex need PrEP, every HIV-negative woman who has anal sex should be assessed for PrEP indications. PrEP can be prescribed and managed by primary care providers including those caring for women's health, and an increasing number of primary care providers have been prescribing PrEP.[29–32] Health care providers can take the following steps to ensure that their female patients receive HIV prevention services: (1) conduct a sexual history, (2) assess risk behaviors, (3) offer HIV testing when appropriate,[2] (4) assess for PrEP indications among HIV-negative women,[3] and (5) prescribe PrEP if indicated. Most women have frequent visits for reproductive health care, and providers can take advantage of these encounters to prevent HIV.[33]

Our study had limitations. HIV testing and sexual behaviors were self-reported and subject to recall bias so it might have been over or underreported. The reliability of self-reported HIV testing in NSFG has not been assessed, but the rate of ever having an HIV test in our study is similar to the rate estimated using data from the 2017 National Health Interview Survey (https://www.cdc.gov/nchs/nhis/releases/released201806.htm#10).[34] Self-reported sensitive information such as sexual behaviors might have been underreported, but the audio computer-assisted self-interviewing method was used to minimize this bias. The NSFG sampling frame included only women of reproductive age, but HIV testing of women who report risk behaviors should be performed, regardless of age.

We excluded women who were pregnant in the past year because women are routinely tested for HIV as part of prenatal care, regardless of risk. If a woman did not complete her pregnancy or did not receive prenatal care, such as with a spontaneous or elective abortion, we might have underestimated HIV testing rates of women with sexual risk behaviors. We were not able to determine whether a condom was used during anal sex, only whether a condom was used during any type of sex.

In summary, women reported that their health care providers infrequently asked them about their types of sexual behavior and that few women who reported anal sex had a recent HIV test. While a history of gonorrhea or syphilis was associated with the highest rates

of HIV testing, women who engaged in anal sex were no more likely to have an HIV test than women who did not report sexual behavior that increases the risk of acquiring HIV. Women who report sexual behaviors such as anal sex would benefit from an HIV test and an assessment for PrEP eligibility. Women's health care providers are uniquely poised to provide HIV prevention for women who tend to have frequent encounters with the health care system.

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AJOG at a Glance

Why was this study conducted?

To estimate HIV testing rates among women who reported anal sex and other sexual risk behaviors.

Key findings

Based on an analysis of a national survey, 20% of sexually active US women aged 15–44 years reported anal sex in the past year. But among women who reported anal sex, only 19% were asked by their health care provider about their type of intercourse in the past year and only 20% were tested for HIV. Asking about the type of intercourse is important because we found it was significantly associated with a higher rate of HIV testing (37.8%) among women who reported anal sex.

What does this add to what is already known?

Universal opt-out HIV testing is recommended for all persons aged 15–64 years, but annual testing is recommend for persons who are at high risk of acquiring HIV. Asking about type of intercourse, including anal sex, is important to identify women who should be tested for HIV annually.

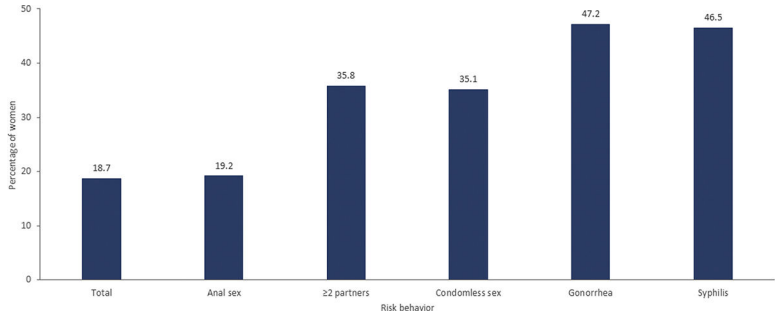

FIGURE 1.

HIV testing within past year of sexually active nonpregnant women

HIV testing within the past year of sexually active nonpregnant women aged 15–44 years in the United States by HIV sexual risk factor, National Survey of Family Growth, 2011–2015.

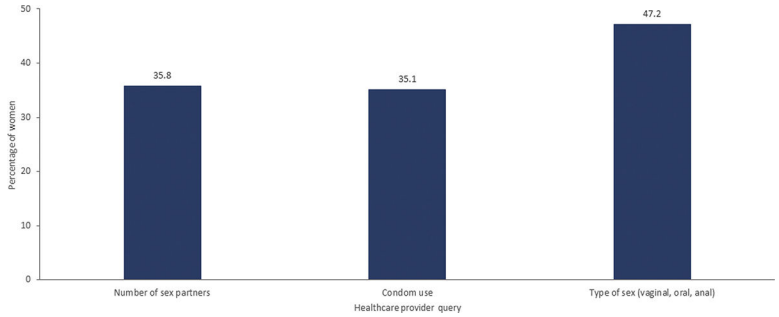

FIGURE 2.

Health care provider queries of sexually active nonpregnant women

Health care provider queries of sexually active nonpregnant women aged 15–44 years in the United States about their sexual risk behaviors in the past year, National Survey of Family Growth, 2013–2015.

TABLE 1

Demographic characteristics of sexually active, nonpregnant women aged 15–44 years in the United States, National Survey of Family Growth, 2011–2015

Characteristic	Sample size	Number (%)[a]
Total	7526	42,361,000 (100)
Age group, y		
15–19	818	3,863,000 (9.1)
20–24	1247	6,959,000 (16.4)
25–29	1432	7,344,000 (17.4)
30–34	1470	7,662,000 (18.1)
35–39	1312	7,760,000 (18.3)
40–44	1247	8,773,000 (20.7)
Race and ethnicity		
White non-Hispanic	3697	25,374,000 (59.9)
Black non-Hispanic	1569	5,827,000 (13.8)
Hispanic	1798	8,237,000 (19.4)
Other	462	2,923,000 (6.9)
Residence		
Urban	6351	35,958,000 (84.9)
Rural	1175	6,403,000 (15.1)
Education		
Some high school	1270	5,789,000 (13.7)
High school graduate	1998	10,574,000 (25.0)
Some college or associate degree	2432	13,652,000 (32.2)
College graduate	1826	12,346,000 (29.1)

[a]Weighted to generate nationally representative estimates.

TABLE 2

Sexual risk behaviors reported by sexually active nonpregnant women aged 15–44 years in the United States, National Survey of Family Growth, 2011–2015

Risk behavior	Sample size	Number (%)[a]
Total	7526	42,361,000 (100)
Anal sex in past year	1655	9,023,000 (20.0)
≥2 partners in past year	1632	7,738,000 (18.3)
Gonorrhea in past year	69	267,000 (0.63)
Syphilis ever	40	174,000 (0.41)
Condomless sex with at-risk partner	1057	5,186,000 (12.1)

[a]Weighted to generate nationally representative estimates.

TABLE 3

Provider sexual history and HIV testing of sexually active nonpregnant women aged 15–44 years in the United States who reported anal sex, National Survey of Family Growth, 2013–2015

HIV sexual risk factor	Sample size	Number (%)[a]	Tested for HIV (%)[a]
Total	3793	42,347,000 (100)	8,047,000 (19.0)
Anal sex in past year	865	9,236,000 (21.8)	1,852,000 (20.1)
Type of sex was asked by provider	198	1,769,000 (19.2)	669,000 (37.8)
Type of sex was not asked by provider	667	7,467,000 (80.8)	1,183,000 (15.9)

[a]Weighted to generate nationally representative estimates.