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## Chlamydia Screening Among Women Aged 15 to 44 Years Who Reported Anal Sex During the Past 12 Months in the United States, 2013 to 2017

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### Abstract

Using the 2013–2017 National Survey of Family Growth, 37.6% of women with 1 anal sex partner in the last 12 months reported chlamydia testing at unspecified anatomic sites in the past 12 months. Women whose medical provider asked about type of sex (i.e., vaginal, oral, anal), compared with those whose provider did not, reported higher chlamydia testing.

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Chlamydia is the most reported sexually transmitted infection (STI) in the United States, with 1.8 million cases reported in 2018.<sup>1</sup> Of those 1.8 million cases, approximately 1.1 million cases occurred in women. Genital chlamydia in women can lead to adverse consequences such as ectopic pregnancy, pelvic inflammatory disease, and infertility.<sup>2</sup> Condomless anal sex is associated with STI and HIV acquisition.<sup>3,4</sup> Rectal chlamydial infections in women may lead to autoinoculation of the upper genital tract or transmit from the rectum to the vagina and vice versa.<sup>5</sup> Because women with chlamydia are often asymptomatic, the Centers for Disease Control and Prevention (CDC) recommends annual screening of all sexually active women younger than 25 years and women 25 years or older with increased risk factors (e.g., women with a new sex partner or multiple sex partners).<sup>2</sup>

Anal sex is a common sexual act among women; approximately 33% of all sexually active women aged 15 to 44 years reported ever having anal sex.<sup>6</sup> Urogenital specimens alone may not be sufficient to identify rectal chlamydia. A previous study found that 21% and 18% of women with a positive rectal chlamydia and gonorrhea test, respectively, had a negative urogenital test result.<sup>5</sup> Another study found that 47% of positive rectal chlamydial or gonococcal infections had negative urogenital test results.<sup>7</sup> The CDC guidelines do not recommend rectal STI screening among women; however, the CDC does recommend health care providers regularly screen patients by obtaining sexual histories from their patients using an effective approach, called “Five P’s” (partners, practices, prevention of pregnancy,

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protection from STIs, and past history of STIs), to elicit information on sexual practices.<sup>2</sup> By asking about sexual practices and related symptoms, providers may collect appropriate anatomical site specimens for diagnosing STIs.<sup>2,8,9</sup> However, a previous study reported that 19% of women reporting anal sex were asked by their providers about the types of sex they had (i.e., oral, vaginal, or rectal).<sup>3</sup>

Previous studies have shown that a portion of rectal-only infections may be missed if only testing urogenital specimens; in addition, these studies did not collect information on provider sexual history counseling, which may identify where gaps in chlamydia screening exist.<sup>5,7,10,11</sup> The objectives of this study were, using a nationally representative survey, as follows: (1) estimate how many sexually active women in the United States had anal sex in the past 12 months, (2) identify how many women reporting anal sex were tested for chlamydia in the past 12 months, and (3) assess the association between chlamydia testing and if providers asked women about type of sex they had in the past 12 months.

## METHODS

We used public-use data from the National Survey of Family Growth (NSFG), a nationally representative household survey of men and women. The NSFG survey cycle was conducted continuously from September 2011 to September 2019. Public-use data files have been released at 2-year intervals under the continuous fieldwork. For example, the public-use NSFG data for 2013 to 2015 were based on interviews conducted September 2013 to September 2015. This analysis combined the public-use NSFG data for 2013 to 2015 and 2015 to 2017. The survey response rates for women were 71.2% in 2013 to 2015 and 66.7% in 2015 to 2017.<sup>12,13</sup> The survey included questions about sexual behaviors, STI testing, and history of STIs. During interviews, questions regarding some sexual behaviors, including oral and anal sex, were collected using audio computer assisted self-interviewing (ACASI) to avoid underreporting on sensitive questions.

The analysis was restricted to sexually active women aged 15 to 44 years. We defined sexually active women as those who had 1 male sexual partner(s) within the past 12 months reported in ACASI. Women reporting anal sex in the past 12 months were identified by reporting 1 partner in the last 12 months when asked, "Thinking of your male partners in the last 12 months, with how many of them did you have anal sex?" Chlamydia testing was measured through the question "In the last 12 months, that is, since interview, have you been tested for chlamydia?" The answers were either "yes" or "no," and responses listed as "not ascertained," "do not know," and "refused" were treated as missing.

Among women reporting anal sex in the past 12 months, we examined if their provider asked about the type of sex they had. The 2013 to 2015 cycle was the first time when the following question was 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?" Answers were categorized into "yes" or "no," and responses listed as "not ascertained," "do not know," and "refused" were treated as missing.

To account for the complex sampling design of the NSFG, we used SAS version 9.4 (SAS Institute, Inc, Cary, NC) and SAS survey procedures to analyze survey data, generate weighted estimates with 95% confidence intervals (CIs), and conduct  $\chi^2$  analyses. We estimated the weighted proportion of women aged 15 to 44 years who were sexually active in the past 12 months, the weighted proportion of sexually active women who had anal sex in the past 12 months, the weighted proportion of women with anal sex in the past 12 months who were tested for chlamydia, and the weighted proportion of women with anal sex in the past 12 months who were asked about their type of sex by their health care providers. Bivariate analyses were used to estimate the association between chlamydia testing and if their medical provider asked about the type of sex they had overall and by age groups. In all analyses, a statistically significant difference was defined as a 2-tailed probability of  $<0.05$ .

## RESULTS

From the 2013–2017 NSFG data set, 10,590 women aged 15 to 44 years were interviewed, representing 61 million women in the US household population; 8471 (82.1%) were identified as sexually active women based on their ACASI responses. Among sexually active women, 1861 (21.2%) reported 1 male anal sex partner in the past 12 months (Table 1). The mean number of anal sex partners among women reporting any anal sex in the past 12 months was 1.2 partners (results not shown). Among women having anal sex, 82.9% reported condomless anal sex at last anal sex (results not shown).

A higher proportion of women who had anal sex in the past 12 months reported chlamydia testing than did other sexually active women who did not have anal sex in the past 12 months (38.0% [95% CI, 34.8%–41.2%] vs. 28.7% [95% CI, 27.1%–30.4%],  $P < 0.001$ ). The proportion of women asked about their types of sex by their health care providers did not vary between women who had anal sex and sexually active women who did not have anal sex (19.3% [95% CI, 16.7%–22.0%] vs. 17.9% [95% CI, 16.2%–19.4%],  $P = 0.27$ ).

Of the women reporting anal sex in the past 12 months, women whose medical provider asked in the past 12 months about the type of sex they have were more likely to have been tested for chlamydia in the last 12 months (66.9% [95% CI, 60.4%–73.4%] vs. 30.7% [95% CI, 27.2%–34.3%],  $P < 0.001$ ; Table 2). Among women reporting anal sex in the past 12 months, women aged 15 to 24 years were more likely to be asked about their sexual behaviors by their health care providers than women aged 35 to 44 years (26.3% [95% CI, 21.0%–31.7%] vs. 12.3% [95% CI, 8.1%–16.4%],  $P < 0.001$ ).

## DISCUSSION

Although anal sex can increase women's risk of acquiring STIs and HIV, this study showed that few women reporting anal sex were tested for chlamydia in the past year. In addition, among those tested, it is possible, they were only tested at the urogenital site because most chlamydia tests are performed on urogenital specimens.<sup>5,7</sup> Our results showed that health care providers rarely ask women about the type of sex they had. It is important for providers to assess the sexual practices of their patients including anal sex practices and related symptoms, so they may appropriately test their patients to prevent any adverse outcomes

from chlamydia.<sup>3,8</sup> For providers to obtain patient's adequate sexual history with specific sexual practices, new interventions are needed. A possible solution is for clinical systems to collect sex history information before the clinical encounter through electronic health record forms or a patient tablet form.

Previous meta-analyses have shown that there is not an association between anal sex and rectal chlamydia.<sup>10,11</sup> However, other studies indicated that women who had anal sex had a high proportion of rectal chlamydia.<sup>5,7</sup> In addition, a previous modeling study indicated that approximately 40% of HIV infections in women aged 18 to 34 years can be attributed to anal sex.<sup>14</sup> One study found that if providers can increase the assessment of women's sexual practices, more women will be eligible for HIV preexposure prophylaxis for HIV prevention.<sup>3</sup> More studies, especially modeling studies, are needed to estimate how much of chlamydial incidence and transmission is attributable to anal sex.

This study was subject to limitations. First, anal sex was self-reported, which could lead to social desirability bias, and the measure on anal sex in the past 12 months might have recall error.<sup>15</sup> However, the ACASI method was used to minimize these biases in the survey. Second, the NSFG survey is a household-based survey so the survey does not include homeless or incarcerated; in addition, it may miss other high-risk core groups (e.g., sex workers) with a high prevalence of chlamydia because of lack of questions. Third, the NSFG female respondent survey's question about chlamydia testing is not anatomic site specific; therefore, it is impossible to tell if the respondent was tested rectally. In addition, the survey did not ask if, at the time when the respondents were tested for chlamydia, their provider asked them about the type of sex practices or if, at the time when provider asked women about the type of sex practices, women were tested for chlamydia. Finally, the results of this study may be conflated as the medical providers testing for chlamydia are more likely to ask about a sexual history without being prompted.

In summary, our results indicate that many women have anal sex; however, most of them were not tested for chlamydia. In addition, more than half of the women who were tested for chlamydia were not asked about the type of sex they had, possibly limiting providers from testing rectally, where a woman might have a chlamydial infection. By taking a sexual risk assessment, providers may test patients having anal sex and identify possible rectal infections and, in turn, potentially curb the incidence of chlamydia among women having anal sex.

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Demographics of All Women Aged 15 to 44 Years Reporting 1 Anal Sex Partners in the Past 12 Months, 2013–2017 NSFG

TABLE 1.

	Sample	Weighted No.	Weighted, %	(95% CI)
Women who had 1 anal sex partner in the past 12 mo	1861	10,718,276		
Age group, y				
15–19	153	693,304	6.5	(5.1–7.9)
20–24	357	2,095,400	19.5	(16.7–22.4)
25–29	454	2,608,812	24.3	(21.4–27.3)
30–34	377	1,845,348	17.2	(14.5–19.9)
35–39	289	2,007,654	18.7	(16.1–21.3)
40–44	231	1,467,758	13.7	(11.2–16.1)
Race and ethnicity				
White non-Hispanic	1038	6,903,291	64.4	(60.0–68.8)
Black non-Hispanic	333	1,321,422	12.3	(9.6–15.0)
Hispanic	410	2,041,132	19.0	(15.1–23.0)
Other	80	452,431	4.2	(2.9–5.5)
Residence				
Urban	1,556	8,855,047	82.6	(77.5–87.8)
Rural	305	1,863,230	17.4	(12.2–22.5)
Education				
Some high school	232	969,166	9.0	(7.3–10.8)
High school graduate	561	2,961,559	27.6	(24.3–30.9)
Some college	664	3,942,718	36.8	(33.8–39.8)
college grad	404	2,844,834	26.5	(22.6–30.5)
Insurance				
Private	948	6,195,801	57.8	(53.3–62.3)
Medicaid	491	2,225,107	20.8	(17.5–24.0)
Medicare	81	412,071	3.8	(2.4–5.3)
Single service or not covered	341	1,885,297	17.6	(14.4–20.8)
Had a usual place of health care				
Yes	1565	9,088,026	84.8	(82.3–87.3)

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	Sample	Weighted No.	Weighted, %	(95% CI)
No	296	1,630,250	15.2	(12.7–17.7)
Had a routine place for health care and went there in last year (n = 1565)				
Yes	1321	7,744,344	85.2	(83.2–87.2)
No	244	1,343,682	14.8	(12.8–16.8)

**TABLE 2.**  
Chlamydia Testing Rate Among Women Aged 15 to 44 Years Who Reported 1 Anal Sex Partner in the Last 12 Months

	Unweighted n	Weighted Column %	(95% CI)	Tested for Chlamydia in the Last 12 mo, Unweighted n	Weighted Row, %	(95% CI)
Overall	1861	100		758	37.7	(34.5–41.0)
Sexually active women reporting 1 anal sex partner in last 12 mo						
In last 12 mo, medical provider asked if the respondent had vaginal, anal, or oral sex						
Yes	418	19.3	(16.6–22.0)	295	66.9	(60.4–73.5)
No	1443	80.7	(78.0–83.4)	463	30.7	(27.2–34.3)
Aged 15–24 y						
Sexually active women reporting 1 anal sex partner in last 12 mo	510	100		237	44.0	(37.8–50.2)
In last 12 mo, medical provider asked if the respondent had vaginal, anal, or oral sex						
Yes	142	26.3	(21.0–31.7)	100	65.6	(53.4–77.7)
No	368	73.7	(68.3–79.0)	137	36.3	(29.6–43.0)
Aged 25–34 y						
Sexually active women reporting 1 anal sex partner in last 12 mo	831	100		389	41.7	(35.9–47.6)
In last 12 mo, medical provider asked if the respondent had vaginal, anal, or oral sex						
Yes	196	20.4	(16.2–24.6)	153	76.8	(68.3–85.4)
No	635	79.6	(75.4–83.8)	236	32.7	(26.6–38.9)
Aged 35–44 y						
Sexually active women reporting 1 anal sex partner in last 12 mo	520	100		132	27.6	(21.5–33.6)
In last 12 mo, medical provider asked if the respondent had vaginal, anal, or oral sex						
Yes	80	12.3	(8.1–16.4)	42	48.1	(31.5–64.7)
No	440	87.7	(83.6–91.9)	90	24.7	(18.3–31.0)