



Published in final edited form as:

Sex Transm Dis. 2018 December ; 45(12): 775–782. doi:10.1097/OLQ.0000000000000889.

Heterosexual Anal and Oral Sex in Adolescents and Adults in the United States, 2011–2015

Melissa A. Habel, MPH, Jami S. Leichliter, PhD, Patricia J. Dittus, PhD, Ian H. Spicknall, PhD, Sevgi O. Aral, PhD

Division of STD Prevention, Centers for Disease Control and Prevention, Atlanta, GA

Abstract

Background: Heterosexual anal and oral sex are related to the acquisition and transmission of sexually transmitted diseases (STDs). As common reportable STDs (chlamydia, gonorrhea, and syphilis) in the United States are increasing, it is important to understand recent oral and anal sexual behaviors.

Methods: We examined the prevalence and correlates of heterosexual anal and oral sex, associated condom use, and having multiple partners among men and women aged 15 to 44 years.

Results: Approximately one third of women and men had ever engaged in anal sex, including 11% of adolescents (15–19 years). Most women and men had ever received or given oral sex (at >75%). Six percent and 7% of women and men, respectively, used a condom at last oral sex compared with 20% and 30% who used a condom at last anal sex. Having multiple sex partners in the past year was most common among adolescents, never or formerly married persons, and those who had a nonmonogamous partner. Less than 10% reported multiple anal sex partners in the past year. A substantial minority had multiple oral or anal sex partners; black women and men had the highest reports of oral sex partners by race/ethnicity.

Conclusions: Anal and oral sex are common sexual practices. Given the low rates of condom use during these behaviors, it is important that recommendations for sexual risk assessments are followed. Tailored messaging regarding risk for STD and human immunodeficiency virus acquisition during oral and anal sex may benefit adolescents, singles, and divorced individuals. Future discussions regarding the benefits of extragenital STD testing for heterosexuals may be useful.

Anal and oral sex are common sexual practices among heterosexuals, and the prevalence of these behaviors tends to increase with age.¹ A 2002 to 2003 United States (US) national probability survey found that more than 75% of men and women had ever engaged in oral sex, and half of all adolescents had received oral sex.² A more recent analysis using 2009 to 2010 NHANES data found a slightly higher oral sex prevalence (>80%) among men and women.³ Reports of receiving oral sex were slightly lower among adolescent males (47%)

Correspondence: Melissa A. Habel, MPH, Centers for Disease Control and Prevention, 1600 Clifton Rd, Mailstop E-04, Atlanta, GA 30329. mlabel@cdc.gov.

Supplemental digital content is available for this article. Direct URL citations appear in the printed text, and links to the digital files are provided in the HTML text of this article on the journal's Web site (<http://www.stdjournal.com>).

(for further references, please see "Supplemental References," <http://links.lww.com/OLQ/A290>)

and females (41%) compared with older age groups, respectively. Prevalence of heterosexual anal intercourse (HAI) varies by age and subgroups.⁴ Previous studies estimate that between 25% and 44% of men and 16% and 36% of women have engaged in HAI in their lifetimes.^{2,5-8} Leichliter et al. found that the percentage of men and women engaging in lifetime anal and oral sex was higher in those aged 20 to 24 years compared with those aged 15 to 19 years. Heterosexual anal intercourse has also been associated with risk behaviors, such as concurrent and multiple partnerships, and drug and alcohol use.⁵

Individuals, especially youth, may engage in oral sex instead of vaginal sex because they believe it to be less risky for sexually transmitted disease (STD) transmission and pregnancy.^{9,10} Though the risk for oral sex is lower compared with vaginal or anal sex, both oral sex and HAI come with risk factors for acquisition and transmission of human immunodeficiency virus (HIV)¹¹⁻¹⁴ and other bacterial and viral STDs, not limited to chlamydia, gonorrhea, syphilis, herpes, and human papillomavirus (HPV) infection.¹⁴⁻¹⁷ Likewise, both behaviors have been linked to cancer: anal sex with anal cancer in women and abnormal anal cytology, and oral sex and HPV have been associated with oropharyngeal cancer.¹⁷⁻¹⁹ Most extragenital infections are asymptomatic, and research suggests they can be transmitted to sexual partners when sexual contact is made with infected anatomical sites (ie, rectum to urethra during anal sex or pharynx to urethra during oral sex).²⁰ Consequently, untreated extragenital infections can serve as a reservoir for ongoing STD transmission and may also lead to increased HIV acquisition.²⁰ Concerning HAI, women are especially vulnerable to STD/HIV acquisition, because receptive anal sex carries a higher transmission risk.¹³

Despite these risks, condom use during last oral and anal sex remains relatively uncommon among heterosexuals.^{2,5,7,21-24} Leichliter et al. found that less than a quarter of men and women had used a condom at last anal sex and less than 7% at last oral sex. A 2009 national probability sample of males and females aged 14 to 94 years found that condom use during the past 10 anal sex events was lower among women than men (13% vs. 26%).²⁵ A more recent US national probability study examining condom use among adolescents and young adults found that condom use at last oral sex was reported by only 8% of females and 9% of males.⁹ Females aged 20 to 24 years and 18 to 19 years had significantly lower odds of reported condom use at last sex compared with those aged 15 to 17 years.⁹ The same study found that females aged 20 to 24 years had almost double the odds of reporting 2 or more oral sex partners compared with those aged 15 to 17 years.

For the third consecutive year, the United States has seen increasing rates of chlamydia, gonorrhea, and primary and secondary syphilis.²⁶ Adolescents and young adults (15-24 years) continue to make up most of the reported chlamydia (CT) and gonorrhea (GC) infections, but are now experiencing syphilis increases.²⁶ Despite these increases in STDs and the common practice of oral and anal sex among heterosexuals, extragenital screening for STDs among heterosexuals is not routine.²⁷ Several studies suggest that many CT/GC infections are being missed in heterosexuals due to the absence of extragenital screening and may range from 25% to 30% for GC and 14% to 44% for CT.^{20,27,28} Given the low rates of condom use during anal and oral sex, the absence of a routine recommendation for extragenital screening, and the rising rates of STDs, it is important to examine recent

heterosexual oral and anal sexual behaviors in the general population on a national level. This article updates the literature by describing: (1) the prevalence and correlates of heterosexual anal and oral sex; (2) factors associated with condom use at the most recent episode of heterosexual anal and oral sex; and (3) the prevalence of having multiple heterosexual anal, oral, and vaginal sex partners.

MATERIALS AND METHODS

We used survey data from the 2011 to 2015 National Survey of Family Growth (NSFG). The NSFG is a nationally representative, multi-stage probability sample of men and women in the US household population ages 15 to 44 years.^{29s} The response rate for 2011 to 2015 was 71.0% and included 20,621 respondents (11,300 women; 9321 men). The NSFG includes oversamples of non-Hispanic blacks, Hispanics, and adolescents. Sensitive survey questions, such as anal and oral sex, were asked using audio computer-assisted self-interview (ACASI). All participants provided informed consent, and the survey was approved by the US Centers for Disease Control and Prevention's (CDC) institutional review board. More detailed information of the survey design and sample have been published elsewhere.^{29s}

The sexual behavior variables included in this analysis were asked in the ACASI portion of the survey. Using a similar methodology to Leichter et al. only data specific to oral and anal sex with opposite-sex partners are included. Thus, when we use "oral sex" and "anal sex" we are referring to oral or anal sex with an opposite-sex partner only (also referred to throughout as heterosexual oral and anal sex). Heterosexual oral sex was focused on giving and receiving this type of sex: (1) have you given oral sex to an opposite-sex partner? (2) Have you received oral sex from an opposite-sex partner? The time frame for oral and anal sex was the respondent's lifetime. Participants were also asked about condom use at last oral and anal sex and last fellatio. Additionally, participants were asked the number of anal, oral, and vaginal sex partners they had in the past 12 months, separately; individuals were defined as having multiple sex partners in the past 12 months for each type of sex, separately, when they reported 2 or more sex partners in the past year for that type of sex. A survey item asking "In the last 12 months, did you have sex with any (opposite-sex partners) who were also having sex with other people at around the same time" was used to delineate having a nonmonogamous sex partner in the past 12 months.

The primary outcomes assessed were (1) lifetime heterosexual anal and oral sex; (2) condom use at last anal sex and last fellatio (limited to those who engaged in the relevant behavior); and (3) multiple oral, anal, vaginal sex partners in last 12 months. For correlates, we included several demographic variables associated with anal or oral sex in previous research²: age, race/ethnicity, and marital status. We also included 2 measures to assess sexual risk: (1) having a nonmonogamous sex partner in last 12 months (ie, a partner who was also having sex with other people at around the same time) and (2) number of lifetime sex partners (calculated based on self-report of ever having vaginal, oral or anal sex).

Statistical Methods

We used SAS (Release 9.3, SAS Institute, Cary, North Carolina) survey procedures for basic frequency and bivariate analyses. To account for complex sampling methods, we used

SUDAAN (Release 11.0.1, Research Triangle Institute, Research Triangle Park, North Carolina) to calculate confidence intervals (CI), standard errors (SE), and significance testing. To yield national estimates for the US population aged 15 to 44 years, all analyses were weighted; complex sampling procedures used for the NSFG (e.g., strata and cluster variables) were applied. Men and women were examined as separate, distinct groups, similar to previous STD-related research.^{2,30s–33s} Among men and women, we examined potential associations between demographic and sexual risk correlates and the 3 groups of outcome variables, separately. For bivariate comparisons, we used χ^2 and *t* tests; logistic regression models included variables significant at *P* less than 0.25,^{2,34s} and variables were considered significant contributors if the 95% CI did not contain 1.0. Analyses for lifetime sexual behaviors included all respondents, whereas those for sexual behaviors in the past 12 months were limited to respondents who (1) had any type of sex in the past 12 months and (2) who reported ever engaging in the relevant type of sex. Adjusted models of lifetime sexual behaviors are limited to sexually active (vaginal, anal or oral sex in the past 12 months) respondents given that we included a measure of recent sexual behavior (nonmonogamous sex partner) in the models.

RESULTS

Anal and Oral Sex (Lifetime) and Condom Use (Last Sex): Bivariate Analyses

Overall, 33.2% (95% CI, 31.9–34.7) of women and 37.7% (95% CI, 35.9–39.5) of men had ever engaged in anal sex, including approximately 11% of adolescents aged 15 to 19 years (Tables 1 and 2). Over 75.0% of males and females aged 15 to 44 years reported ever receiving or giving oral sex. For both females and males, the prevalence of lifetime anal and oral sex significantly differed (*P* < 0.05) for all of the demographics that we examined. For both females and males, the prevalence of condom use at last anal and oral sex differed (*P* < 0.05) by the following demographics: age, race/ethnicity, marital status. For women, condom use at last oral sex differed by number of lifetime sex partners (*P* < 0.05), and condom use at last anal sex met the inclusion criteria for the multiple logistic regression models. For men, non-monogamous sex partner was significantly associated with condom use at last anal and oral sex (*P* < 0.05), but number of lifetime sex partners was significantly associated with condom use at last oral sex only (*P* < 0.05).

Multiple Logistic Regression Models

Anal Sex (Lifetime)—In adjusted analyses, several factors were associated with having ever engaged in HAI (Tables 3 and 4). Men and women aged 20 to 24, 25 to 34, and 35 to 44 years had elevated odds of ever having HAI compared to their adolescent counterparts. Black women (adjusted odds ratio [AOR], 0.5; 95% CI, 0.4–0.6) were less likely to have engaged in anal sex than white women. Similarly, Hispanic (AOR, 0.7; 95% CI, 0.6–0.9) and black men (AOR, 0.4; 95% CI, 0.3–0.6) were less likely than white men to have engaged in HAI. In both men and women, those who had a nonmonogamous sex partner in the past 12 months were more likely to have ever had anal sex than those who did not have this type of partner. Formerly married (AOR, 2.5; 95% CI, 1.9–3.3) and currently cohabiting men (AOR, 1.9; 95% CI, 1.5–2.4) were more likely than those who had never married to have engaged in HAI; a similar pattern emerged in women. A higher number of lifetime sex

partners and having a nonmonogamous partner in the past 12 months were associated with a history of HAI in both women and men.

Oral Sex (Lifetime)—Oral sex increased by age among men and women, with the older age groups more likely to have given oral sex compared to adolescents. Racial minorities were significantly less likely than their white respondents to have ever given or received oral sex. Marital or cohabitating status was not associated with receiving or giving oral sex, with 1 exception. The odds of ever having given oral sex were higher for cohabitating men than for never-married men (AOR, 1.6; 95% CI, 1.1–2.3). In most instances, having a nonmonogamous partner in the past 12 months, and a higher number of lifetime partners were associated with giving and receiving oral sex in women and men.

Condom Use at Last Anal and Oral Sex—In women and men, there was no association between age groups and condom use at last anal or oral sex; however, there were differences across marital status and race/ethnicities. Hispanic and black women were more likely than white women to use a condom at last anal sex (AOR, 1.5; 95% CI, 1.0–2.2 and AOR, 1.7; 95% CI, 1.3–2.3) and at last oral sex (AOR, 2.2; 95% CI, 1.6–3.0 and AOR, 2.1; 95% CI, 2.0–3.7). The odds of condom use during last anal (AOR, 2.3; 95% CI, 1.7–3.1) and oral sex (AOR, 4.1; 95% CI, 3.0–5.7) were higher for black men than that for white men. Similarly, Hispanic men were more likely than white men to report condom use at last anal sex (AOR, 1.9; 95% CI, 1.4–2.5) and oral sex (AOR, 3.1; 95% CI, 2.2–4.4). Condom use at last anal sex and oral sex was more likely among never married women compared to married, cohabitating, and formerly married women. Finally, having a higher number of sex partners in one's lifetime was associated with reporting condom use at oral sex in both women and men, but not anal sex.

Multiple Anal, Oral, and Vaginal Sex Partners (Past 12 Months)—Men had higher reports of having 2 or more anal, oral, and vaginal sex partners than women in the past 12 months (Table 5). For women and men, race was associated with having multiple oral and vaginal sex partners (female oral, $P = 0.0012$; rest, $P < 0.0001$) with black respondents having the highest reports. Multiple anal, oral, and vaginal sex partners in the past 12 months was more common among adolescents compared with those aged 20 to 24 years, 25 to 34 years, and 35 to 44 years (female anal, $P = 0.0038$; rest, $P < 0.0001$). Marital or cohabitating status in both women and men was also strongly associated with having 2 or more anal, oral, and vaginal sex partners in the past 12 months (all $P < 0.0001$) with multiple partners more common among formerly married and never married. Likewise, in women and men, having a nonmonogamous sex partner was strongly associated with having multiple anal, oral, and vaginal sex partners in the past 12 months (all $P < 0.0001$).

DISCUSSION

In the U.S. general population 15 to 44 years of age, the prevalence of anal sex in 2011 to 2015 increased slightly from the 2002 to 2003 estimates among women (30%–33%) and men (34%–38%), respectively. The prevalence of ever receiving or giving oral sex remained stable between the 2 periods (2002–03 vs. 2011–15) among men and women at more than 75%; however, receiving oral sex appeared to slightly decrease among adolescent females

(50% vs. 42%) and males (52% vs. 49%), respectively. The prevalence of condom use at last oral sex among men and women remained stable between the time periods at 6% and 7%. Condom use at last anal sex among adolescent females increased from 26% to 32% and among males from 34% to 46%. These findings are consistent with previous studies.^{7,10,30s,35s,36s}

Similar to Leichliter et al. regression models showed that being white, 20–44 years old, and reporting a nonmonogamous partner was associated with history of anal sex. Being white, aged 20 to 24 years, 25 to 34 years, and 35 to 44 years, married, and having higher numbers of lifetime sex partners were associated with having ever given oral sex in both men and women; giving oral sex was also associated with having a nonmonogamous sex partner in men. Formerly married and currently cohabitating women and men were more likely to have ever had anal sex, relative to their counterparts. Having multiple anal, oral, and vaginal sex partners in the past year were most common among adolescents, persons who were never or formerly married, and those who also had a nonmonogamous partner in the past year. Although the prevalence of multiple anal sex partners in the past year was low, a substantial minority of respondents had multiple oral or vaginal sex partners, with black respondents having highest reports by race/ethnicity. Similar to Leichliter et al., white respondents were less likely to use condoms when engaging in HAI and oral sex; however, condom use remains low across all racial/ethnic groups.

We found that having multiple anal, oral, and vaginal sex partners in the past 12 months was more common among adolescents compared with those aged 20 to 24 years, 25 to 34 years, and 35 to 44 years. Multiple sequential partners in youth are common given the short duration of their relationships (39s). However, their tendencies to report incorrect and inconsistent condom use paired with other high-risk behaviors such as alcohol and drug use puts them at greater risk for STD acquisition, including HIV (39s–41s). Additionally, formerly married and never married respondents reported multiple sex partners more frequently than did currently married and cohabitating individuals, suggesting that separated/divorced individuals could have similar risk behaviors as never married individuals. Other studies have noted a greater number of recent sex partners among formerly married/separated women compared to never married women and more nonmonogamous partnerships among formerly married and never married men and women compared with their married counterparts.^{40s–41s} Electronic medical records could prompt providers when a patient has experienced a change in marital/relationship status triggering different counseling and STD screening needs.

This study is limited in that our data are based on self-reports and may be subject to bias. For example, age-related recall bias may have been an issue for older individuals. Someone in their 40s may not be able to recall if they used a condom during last anal sex, which may have occurred in their 20s, but our goal was to examine prevalence and correlates among the US population during this time. Self-reported data of sensitive questions like oral and anal sex were captured using ACASI, which was designed to help minimize underreporting due to social desirability bias. Additionally, a temporal association between sexual behavior correlates, oral and anal sex, and condom use for oral and anal sex could not be detected because of differences in time frames for some survey items. Partner-level associations with

oral and anal sex were also not possible because the questions pertaining to oral and anal sex were not partner specific. Using lifetime measures to capture behavior, particularly with regard to associations with age can limit the findings given that older persons have had more time to engage in the behavior. We tried to counteract this by also examining condom use at last sex, and multiple sex partners in the past 12 months.

Anal and oral sex continue to be common sexual practices among heterosexuals, and given the low rates of condom use during these behaviors and rising rates of STDs, oral, and anal cancers, STD prevention strategies are still needed. The CDC recommends taking a sexual history as part of the clinical encounter to address risk reduction (44s). Providers can encourage risk reduction through addressing the benefits of condom use, abstinence and reducing the number of sex partners, and preexposure HPV vaccination. Better tailored messaging around condom use during HAI may be necessary as this research found that approximately 40% of men and women reported ever having anal sex by the age of 35 years.² Women may be unaware of the risks of HAI because counseling tends to focus on transmission via vaginal sex,^{2,12} and there is no risk for pregnancy during anal sex. Future discussions are needed regarding the benefits of extragenital STD testing for heterosexuals as 1 study found that almost 1 in 2 rectal CT/GC infections might not have been detected through genital testing.^{40s} Although not currently recommended by CDC or the US Prevention Services Task Force, providers may want to consider pharyngeal and rectal screening for at-risk patients when indicated by a sexual history. Potential extragenital screening could include asymptomatic patients and patients who do not report condomless sex, because patients are not always honest about their sexual behaviors and history.²⁰ More frequent screening of extragenital sites among high-risk heterosexuals may have the potential to interrupt STD and HIV transmission.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgment:

The 2011–2013 and 2013–2015 National Survey of Family Growth (NSFG) was conducted by the National Center for Health Statistics (NCHS) at the Centers for Disease Control and Prevention (CDC). Interviewing and other tasks were carried out by the University of Michigan's Institute for Social Research (ISR), under a contract with NCHS. The authors are grateful to study participants and to the research staff at ISR.

REFERENCES

1. Gui L, Hariri S, Heather B, et al. Trends and patterns of sexual behaviors among adolescents and adults aged 14 to 59 years, United States. *Sex Trans Dis* 2015; 42:20–26.
2. Leichter J, Chandra A, Liddon N, et al. Prevalence and correlates of heterosexual anal and oral sex in adolescents and adults in the United States. *J Infect Dis* 2007; 196:1852–1859. [PubMed: 18190267]
3. D'Souza G, Cullen K, Bowie J, et al. Differences in oral sexual behaviors by gender, age, and race explain observed differences in prevalence of oral human papillomavirus infection. *Plos One* 2014; 9:e86023. [PubMed: 24475067]
4. McBride KR, Fortenberry JD. Heterosexual anal sexuality and anal sex behaviors: A review. *J Sex Res* 2010; 47:123–136. [PubMed: 20358456]

5. Hess K, DiNenno E, Sionean C, et al. Prevalence and correlates of heterosexual anal intercourse among men and women, 20 U.S. cities. *AIDS Behav* 2016; 20:2966–2975. [PubMed: 26781872]
6. German D, Nguyen TQ, Ogbue CP, et al. Condomless anal intercourse among males and females at high risk for heterosexual HIV infection. *Sex Transm Dis* 2015; 42:317–323. [PubMed: 25970308]
7. Benson L, Martins S, Whitaker A. Correlates of heterosexual anal intercourse among women in the 2006–2010 National Survey of family growth. *J Sex Med* 2015; 12:1746–1752. [PubMed: 26289541]
8. Chandra A, Mosher WD, Copen C, et al. Sexual behavior, sexual attraction, and sexual identity in the United States: Data from the 2006–2008 National Survey of family growth. *Natl Health Stat Report* 2011; 36:1–36.
9. Holway G, Hernandez S. Oral sex and condom use in a U.S. National Sample of adolescents and young adults. *J Adol Health* 2017; in press: DOI: 10.1016/j.jadohealth.2017.08.022.
10. Halpern-Felsher BL, Cornell JL, Kropp RY, et al. Oral versus vaginal sex among adolescents: Perceptions, attitudes, and behavior. *Pediatrics* 2005; 115:845–851. [PubMed: 15805354]
11. Hawkins D Oral sex and HIV transmission. *Sex Transm Infect* 2001; 77:307–308. [PubMed: 11588267]
12. Stahlman S, Hirz AE, Stirland A, et al. Contextual factors surrounding anal intercourse in women: Implications for sexually transmitted infection/HIV prevention. *Sex Transm Dis* 2015; 42:364–368. [PubMed: 26222748]
13. Baggaley RF, White RG, Boily MC. HIV transmission risk through anal intercourse: Systematic review, meta-analysis and implications for HIV prevention. *Int J Epidemiol* 2010; 39:1048–1063. [PubMed: 20406794]
14. Edwards S, Carne C. Oral sex and the transmission of viral STIs. *Sex Transm Infect* 1998; 74:6–10. [PubMed: 9634307]
15. Edwards S, Carne C. Oral sex and transmission of non-viral STIs. *Sex Transm Infect* 1998; 74:95–100. [PubMed: 9634339]
16. Bruce AJ, Rogers RS 3rd. Oral manifestations of sexually transmitted diseases. *Clin Dermatol* 2004; 22:520–527. [PubMed: 15596324]
17. D’Souza G, Kreimer AR, Viscidi R, et al. Case-control study of human papillomavirus and oropharyngeal cancer. *N Engl J Med* 2007; 356: 1944–1956. [PubMed: 17494927]
18. Holly EA, Ralston ML, Darragh TM, et al. Prevalence and risk factors for anal squamous intraepithelial lesions in women. *J Natl Cancer Inst* 2001; 93:843–849. [PubMed: 11390533]
19. Frisch M, Glimelius B, van den Brule AJ, et al. Sexually transmitted infection as a cause of anal cancer. *N Engl J Med* 1997; 337:1350–1358. [PubMed: 9358129]
20. Chan P, Robinette A, Montgomery M, et al. Extragenital infections caused by Chlamydia trachomatis and Neisseria gonorrhoeae: A review of the literature. *Infect Dis Obstet Gynecol* 2016; DOI: 10.1155/2016/5758387.
21. Civic D College students’ reasons for nonuse of condoms within dating relationships. *J Sex Marital Ther* 2000; 26:95–105. [PubMed: 10693119]
22. Tian LH, Peterman TA, Tao G, et al. Heterosexual anal sex activity in the year after an STD clinic visit. *Sex Transm Dis* 2008; 35:905–909. [PubMed: 18685549]
23. Baldwin JI, Baldwin JD. Heterosexual anal intercourse: An understudied, high-risk sexual behavior. *Arch Sex Behav* 2000; 29:357–373. [PubMed: 10948725]
24. Mackesy-Amiti ME, McKirnan DJ, Ouellet LJ. Relationship characteristics associated with anal sex among female drug users. *Sex Transm Dis* 2010; 37:346–351. [PubMed: 20065891]
25. Reece M, Herbenick D, Schick V, et al. Condom use rates in a national probability sample of males and females ages 14 to 94 in the United States. *J Sex Med* 2010; 7(suppl 5):266–276. [PubMed: 21029384]
26. Centers for Disease Control and Prevention. Sexually Transmitted Disease Surveillance 2016. Atlanta: U.S: Department of Health and Human Services, 2017: Available at <https://www.cdc.gov/std/stats>. Accessed 13 December 2017.

27. Danby CS, Cosentino LA, Rabe LK, et al. Patterns of extragenital chlamydia and gonorrhea in women and men who have sex with men reporting a history of receptive anal intercourse. *Sex Transm Dis* 2016; 43:105–109. [PubMed: 26766527]
28. Bazan J, Reese P, Esber A, et al. High prevalence of rectal gonor-rhea and chlamydia infection in women attending a sexually transmitted disease clinic. *J Womens Health (Larchmt)* 2015;24: 182–189. [PubMed: 25692800]

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

TABLE 1.

Lifetime Heterosexual Anal and Oral Sex by Demographic Characteristics and General Sexual Behavior (Women 15–44), Years 2011–2015

Correlates	Ever Had Anal Sex (Unweighted, n = 11,152) % (95% CI)	Used Condom at Last Anal Sex* (Unweighted, n = 3627) % (95% CI)	Ever Received Oral Sex (Unweighted, n = 11,144) % (95% CI)	Ever Gave Oral Sex (Unweighted n = 11,139) % (95% CI)	Used Condom at Last Oral Sex [†] (Unweighted, n = 8112) % (95% CI)
All women	33.2 (31.9–34.7)	20.7 (18.7–22.7)	77.3 (75.8–78.9)	75.7 (74.1–77.3)	5.6 (4.9–6.3)
Race and Hispanic origin					
White (non-Hispanic)	38.2 (36.4–40.0)	17.8 (15.5–20.4)	84.1 (82.3–85.9)	84.0 (82.3–85.6)	3.6 (2.9–5)
Hispanic	29.1 (26.3–31.9)	25.1 (20.6–30.4)	67.4 (64.4–70.3)	66.1 (63.1–69.0)	8.4 (6.8–10.5)
Black (non-Hispanic)	25.1 (22.4–28.1)	30.0 (25.1–35.5)	74.1 (71.4–76.8)	66.3 (63.3–69.3)	11.3 (9.6–13.4)
Other	22.6 (18.7–27.3)	22.3 (13.2–35.3)	57.3 (51.8–62.8)	55.9 (49.2–62.5)	6.5 (3.7–11.4)
Age, y					
15–19	10.8 (8.8–13.4)	32.0 (23.8–41.6)	42.2 (38.8–46.3)	39.2 (35.5–43.1)	10.4 (7.5–14.2)
20–24	31.5 (28.7–34.6)	25.0 (20.6–30.1)	77.2 (74.5–79.8)	76.4 (73.2–79.5)	6.5 (5.1–8.3)
25–34	38.1 (36.2–40.2)	21.6 (18.4–25.4)	85.3 (83.5–87.0)	83.7 (81.8–85.5)	5.2 (4.4–6.3)
35–44	39.7 (37.2–42.3)	16.5 (13.6–19.9)	85.8 (83.9–87.6)	84.4 (82.4–86.4)	4.5 (3.5–5.8)
Marital or cohabiting status					
Never married, not cohabiting	23.0 (21.2–25.1)	29.1 (25.8–32.7)	62.3 (59.7–64.9)	59.5 (57.1–61.9)	9.0 (7.8–10.5)
Currently married	36.5 (34.4–38.7)	17.5 (14.6–21.0)	86.8 (84.7–88.7)	86.2 (84.2–88.1)	2.6 (2.0–3.6)
Currently cohabiting	43.8 (40.4–47.8)	17.7 (13.9–22.5)	87.6 (85.6–89.5)	86.1 (83.8–88.2)	4.7 (3.6–6.3)
Formerly married, not cohabiting	47.0 (42.5–51.6)	17.6 (13.6–22.6)	85.5 (81.9–88.7)	84.5 (80.7–87.7)	9.6 (7.1–13.1)
Had nonmonogamous sex partner (past 12 months)					
No	36.3 (34.8–37.9)	20.1 (17.9–22.6)	86.6 (85.1–88.0)	85.0 (83.5–86.5)	5.3 (4.6–6.2)
Yes	56.8 (51.8–61.7)	22.1 (17.6–27.6)	94.0 (91.7–95.7)	92.0 (89.1–94.3)	5.7 (4.3–7.7)
No. lifetime sex partners [‡]	M = 10.1 (0.26)	M = 9.5 (0.47)	M = 7.4 (0.15)	M = 7.5 (0.15)	M = 6.0 (0.34)

All data are % (95% CI) with the exception of number of lifetime sex partners which reports the SE. M reported are for the “yes” outcome). Each cell represents the proportion of people in a given group who reported “yes” to engaging in that sexual behavior. N varies by bivariate comparison given differences in missing data.

* Based only on those who ever had anal sex.

[†] Refers to oral-penile sex only (fellatio) and is based only on those who had fellatio.

‡ Data shown are for respondents who reported that they engaged in the outcome.

SE, standard error; M, mean.

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

TABLE 2. Lifetime Heterosexual Anal and Oral Sex by Demographic Characteristics and General Sexual Behavior (Men 15–44), Years 2011–2015

Correlates	Ever Had Anal Sex (Unweighted, n = 9218) % (95% CI)	Used Condom at Last Anal Sex* (Unweighted, n = 3307) % (95% CI)	Ever Received Oral Sex (Unweighted, n = 9220) % (95% CI)	Ever Gave Oral Sex (Unweighted, n = 9218) % (95% CI)	Used Condom at Last Oral Sex† (Unweighted, n = 7074) % (95% CI)
All men	37.7 (35.9–39.5)	30.3 (28.2–32.5)	79.5 (78.0–81.0)	75.4 (74.0–77.0)	6.8 (6.0–7.7)
Race and Hispanic origin					
White (non-Hispanic)	41.4 (39.0–3.9)	24.0 (21.7–26.4)	84.7 (83.0–86.4)	81.3 (79.4–83.1)	3.9 (3.3–6)
Hispanic	34.5 (31.1–38.1)	38.5 (33.6–43.7)	70.4 (67.0–73.7)	66.4 (62.9–69.8)	10.8 (8.6–13.5)
Black (non-Hispanic)	32.0 (28.5–35.8)	44.8 (39.3–50.6)	80.6 (77.0–83.9)	72.0 (68.1–75.5)	13.4 (11.0–16.4)
Other	27.3 (21.8–33.6)	46.9 (35.5–58.8)	62.0 (57.5–66.4)	61.2 (56.9–65.3)	10.5 (7.0–15.6)
Age, y					
15–19	10.5 (8.8–12.6)	46.3 (37.5–55.5)	48.6 (45.2–52.0)	38.6 (35.9–41.5)	10.1 (8.2–12.4)
20–24	33.6 (29.9–37.6)	40.9 (35.0–47.2)	79.8 (76.8–82.5)	71.2 (67.7–74.6)	8.7 (6.7–11.4)
25–34	46.2 (43.6–48.7)	30.5 (27.1–34.2)	87.8 (85.6–89.8)	82.9 (82.9–87.0)	6.5 (5.3–7.9)
35–4	44.9 (41.7–48.2)	23.8 (20.6–27.4)	86.5 (84.4–88.4)	86.6 (84.6–88.5)	5.3 (4.3–6.6)
Marital or cohabiting status					
Never married, not cohabiting	25.3 (23.4–27.3)	43.0 (39.2–46.9)	67.8 (65.5–70.0)	59.5 (57.3–61.7)	10.1 (8.8–11.6)
Currently married	43.5 (40.1–47.2)	22.6 (28.3–32.6)	88.2 (86.2–90.0)	87.8 (85.8–89.7)	3.6 (2.6–5.2)
Currently cohabiting	54.5 (50.5–58.5)	30.3 (25.5–36.0)	90.7 (87.7–93.1)	90.0 (87.5–92.2)	5.9 (4.1–8.5)
Formerly married, not cohabiting	62.4 (57.4–67.3)	23.2 (18.2–29.1)	93.4 (90.5–95.5)	91.5 (88.3–94.0)	9.3 (6.5–13.4)
Had nonmonogamous sex partner (past 12 months)					
No	42.1 (40.0–44.4)	28.8 (26.5–31.3)	89.2 (87.8–90.5)	85.7 (84.3–87.1)	5.8 (5.0–6.8)
Yes	59.7 (55.3–64.1)	36.6 (31.2–42.3)	97.5 (96.5–98.3)	91.4 (88.6–93.6)	10.1 (7.9–13.0)
No. lifetime sex partners‡	M = 15.18 (0.41)	M = 14.64 (0.67)	M = 11.45 (0.27)	M = 11.74 (0.28)	M = 9.93 (0.81)

All data are % (95% CI) with the exception of number of lifetime sex partners which reports the SE (M reported are for the “yes” outcome). Each cell represents the proportion of people in a given group who reported “yes” to engaging in that sexual behavior. N varies by bivariate comparison given differences in missing data.

* Based only on those who ever had anal sex.

† Refers to oral-penile sex only (fellatio) and is based only on those who had fellatio.

Data shown are for respondents who reported that they engaged in the outcome.

SE, standard error; M, mean.

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

TABLE 3. Logistic Regression Models for Lifetime Heterosexual Anal and Oral Sex and Related Condom Use in the Past 12 Months (Women 15–44), Years 2011–2015

Correlates	AOR (95% CI)			
	Ever Had Anal Sex (Unweighted, n = 8813)	Used Condom at Last Anal Sex* (Unweighted, n = 3578)	Ever Received Oral Sex (Unweighted n = 8806)	Ever Gave Oral Sex (Unweighted, n = 8799)
Race and Hispanic origin				
White (non-Hispanic)	Referent	Referent	Referent	Referent
Hispanic	0.8 (0.7–1.0) [‡]	1.5 (1.0–2.1) [‡]	0.3 (0.2–0.4) [‡]	0.3 (0.3–0.4) [‡]
Black (non-Hispanic)	0.5 (0.4–0.6) [‡]	1.7 (1.3–2.3) [‡]	0.3 (0.2–0.4) [‡]	0.2 (0.1–0.2) [‡]
Other	0.7 (0.5–0.9) [‡]	1.2 (0.6–2.1)	0.2 (0.2–0.3) [‡]	0.2 (0.2–0.3) [‡]
Age, y				
15–19	Referent	Referent	Referent	Referent
20–24	1.6 (1.2–2.2) [‡]	0.8 (0.5–1.3)	1.3 (0.9–1.9)	1.5 (1.1–2.1) [§]
25–34	1.6 (1.2–2.2) [‡]	0.8 (0.5–1.3)	1.3 (0.9–1.8)	1.3 (0.9–1.8)
35–44	1.7 (1.3–2.4) [‡]	0.6 (0.4–1.0) [§]	1.2 (0.8–1.7)	1.2 (0.9–1.8)
Marital or cohabiting status				
Never married, not cohabiting	Referent	Referent	Referent	Referent
Currently married	1.1 (1.0–1.4)	0.6 (0.5–0.9) [‡]	1.0 (0.8–1.3)	1.2 (1.0–1.5)
Currently cohabiting	1.4 (1.1–1.8) [‡]	0.6 (0.4–0.8) [‡]	0.9 (0.7–1.2)	1.0 (0.8–1.3)
Formerly married, not cohabiting	1.4 (1.1–1.9) [‡]	0.6 (0.4–0.9) [§]	0.8 (0.5–1.3)	0.9 (0.6–1.5)
Had nonmonogamous sex partner (past 12 mo)				
No	Referent	...	Referent	Referent
Yes	1.9 (1.5–2.4) [‡]	...	1.6 (1.1–2.4) [§]	1.5 (1.0–2.2) [§]
No. lifetime partners [¶]	1.1 (1.1–1.1) [‡]	1.0 (1.0–1.0)	1.2 (1.1–1.3) [‡]	1.2 (1.2–1.3) [‡]

Ellipsis (...) indicates variables not included in model.

[‡] Based only on those who ever had anal sex.

[†]Oral-penile sex only (fellatio) and is based only on those who had fellatio.

[‡] $P < 0.01$.

[§] $P < 0.05$.

^{||}Data shown are for respondents who reported that they engaged in the outcome.

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

TABLE 4.

Logistic Regression Models for Lifetime Heterosexual Anal and Oral Sex and Related Condom Use in the Past 12 Months (Men 15–44), 2011–2015

Correlates	Ever Had Anal Sex (Unweighted, n = 7043)	Used Condom at Last Anal Sex* (Unweighted, n = 3094)	Ever Received Oral Sex (Unweighted, n = 7046)	Ever Gave Oral Sex (Unweighted, n = 7045)	Used Condom at Last Oral Sex† (Unweighted, n = 6306)
	Adjusted OR (95% CI)				
Race and Hispanic origin					
White (non-Hispanic)	Referent	Referent	Referent	Referent	Referent
Hispanic	0.7 (0.6–0.9) [‡]	1.9 (1.4–2.5) [‡]	0.2 (0.2–0.3) [‡]	0.3 (0.2–0.4) [‡]	3.1 (2.2–4.4) [‡]
Black (non-Hispanic)	0.4 (0.3–0.6) [‡]	2.3 (1.7–3.1) [‡]	0.3 (0.2–0.4) [‡]	0.3 (0.2–0.4) [‡]	4.1 (3.0–5.7) [‡]
Other	0.7 (0.5–1.0)	2.7 (1.7–4.4) [‡]	0.3 (0.2–0.4) [‡]	0.4 (0.3–0.5) [‡]	2.3 (1.6–5.0) [‡]
Age, y					
15–19	Referent	Referent	Referent	Referent	Referent
20–24	2.1 (1.5–2.8) [‡]	1.0 (0.6–1.7)	1.1 (0.8–1.6)	1.7 (1.2–2.3) [‡]	1.0 (0.7–1.6)
25–34	2.3 (1.8–3.0) [‡]	0.8 (0.5–1.3)	0.8 (0.6–1.2)	2.2 (1.6–3.1) [‡]	1.0 (0.7–1.6)
35–44	1.9 (1.4–2.7) [‡]	0.7 (0.4–1.1)	0.5 (0.3–0.8) [‡]	1.9 (1.3–3.0) [‡]	1.1 (0.6–1.8)
Marital or cohabiting status					
Never married, not cohabiting	Referent	Referent	Referent	Referent	Referent
Currently married	1.3 (1.0–1.7) [§]	0.5 (0.4–0.6) [‡]	1.2 (0.8–1.7)	1.3 (1.0–1.8)	0.4 (0.2–0.7) [‡]
Currently cohabiting	1.9 (1.5–2.4) [‡]	0.6 (0.5–0.8) [‡]	1.2 (0.7–1.8)	1.6 (1.1–2.3) [‡]	0.6 (0.4–1.0) [‡]
Formerly married, not cohabiting	2.5 (1.9–3.3) [‡]	0.5 (0.3–0.8) [‡]	1.0 (0.6–1.9)	1.3 (0.7–2.2)	0.9 (0.5–1.6)
Had nonmonogamous sex partner (past 12 mo)					
No	Referent	Referent	Referent	Referent	Referent
Yes	1.8 (1.4–2.3) [‡]	1.0 (0.7–1.4)	2.3 (1.7–4.0) [‡]	1.5 (1.0–2.2)	1.4 (0.9–2.1)
No. lifetime partners	1.1 (1.0–1.1) [‡]	...	1.2 (1.1–1.2) [‡]	1.1 (1.1–1.1) [‡]	1.0 (1.0–1.0) ^{§§}

Ellipsis (...) indicates variables not included in model.

* Based only on those who ever had anal sex.

† Oral-penile sex only (fellatio) and is based only on those who had fellatio.

¶ Data shown are for respondents who reported that they engaged in the outcome.

§ $P < 0.05$.

¶ $P < 0.01$.

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

TABLE 5.

Percent of Females and Males Who had Multiple Anal, Oral, and Vaginal Sex Partners in the Past 12 months, 2011–2015

	Females			Males		
	Anal Sex Partners 2 ≥ Partners (n = 3389)	Oral Sex Partners 2 ≥ Partners (n = 7987)	Vaginal Sex Partners 2 ≥ Partners (n = 8870)	Anal Sex Partners 2 ≥ Partners (n = 3114)	Oral Sex Partners 2 ≥ Partners (n = 6665)	Vaginal Sex Partners 2 ≥ Partners (n = 6996)
Total	4.2 (SE, 0.4)	15.1 (SE, 0.5)	17.9 (SE, 0.6)	7.1 (SE, 0.5)	21.2 (SE, 0.7)	22.9 (SE, 0.7)
Race and Hispanic origin	0.2353	0.0012	<0.0001	0.1878	<0.0001	<0.0001
White (non-Hispanic)	3.8 (2.8–5.1)	14.1 (12.8–15.6)	17.0 (15.4–18.7)	6.1 (5.0–7.6)	19.8 (18.2–21.6)	21.1 (19.4–23.0)
Hispanic	4.7 (3.1–7.1)	14.9 (12.9–17.3)	15.6 (13.8–17.8)	9.3 (6.5–13.3)	19.7 (17.3–22.5)	21.5 (18.8–24.6)
Black (non-Hispanic)	5.9 (3.7–9.4)	20.5 (17.8–23.6)	26.8 (23.6–30.2)	8.1 (5.5–11.9)	32.3 (28.8–36.1)	35.6 (31.6–39.9)
Other	2.6 (1.2–5.9)	13.9 (9.7–19.6)	13.6 (10.–18.6)	7.0 (3.7–13.1)	15.2 (11.3–20.4)	17.3 (12.4–23.7)
Age, y	0.0038	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
15–19	8.9 (5.2–15.1)	32.2 (27.3–38.0)	39.3 (34.6–44.4)	23.9 (17.6–31.6)	40.6 (36.7–44.8)	44.8 (40.8–49.0)
20–24	6.0 (3.7–9.6)	24.6 (21.7–27.8)	30.0 (26.7–33.7)	11.3 (8.0–15.8)	37.3 (32.7–42.2)	42.9 (38.4–47.6)
25–34	4.4 (3.2–6.1)	12.5 (11.0–14.2)	15.2 (13.7–17.0)	5.3 (4.1–7.1)	17.6 (15.6–19.9)	19.7 (17.6–22.2)
35–44	2.3 (1.5–3.7)	9.1 (7.6–10.9)	10.1 (8.7–11.9)	5.0 (3.6–7.1)	11.6 (10.0–13.5)	11.7 (10.2–13.5)
Marital or cohabiting status	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Never married, not cohabiting	7.3 (5.3–10.2)	34.5 (32.0–37.1)	41.4 (38.8–44.1)	15.4 (12.5–19.0)	43.1 (40.7–45.7)	49.7 (47.1–52.4)
Currently married	0.8 (0.4–1.7)	2.4 (1.9–3.3)	3.1 (2.5–4.0)	1.7 (0.8–3.7)	3.7 (2.8–4.4)	3.3 (2.6–4.5)
Currently cohabiting	4.2 (2.–6.5)	9.3 (7.4–11.6)	11.9 (9.8–14.6)	4.4 (3.0–6.8)	11.3 (9.0–14.2)	11.8 (9.5–14.7)
Formerly married, not cohabiting	10.2 (6.9–15.1)	31.3 (26.9–36.1)	36.9 (32.3–41.8)	11.2 (7.7–16.1)	45.7 (40.2–51.3)	50.8 (47.1–52.5)
Had nonmonogamous sex partner (past 12 mo)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
No	2.3 (1.7–3.3)	9.5 (8.5–10.6)	11.9 (10.9–13.1)	4.3 (3.4–5.6)	14.3 (13.3–15.6)	15.3 (14.2–16.7)
Yes	14.1 (10.7–18.5)	59.4 (55.3–63.4)	68.9 (64.1–73.4)	21.2 (17.0–26.1)	70.3 (66.6–73.9)	80.2 (76.9–83.2)

All data are % (95% CI) except for the overall mean and standard error (SE). Multiple partners refers to 2 or more partners for each type of sex, separately. Data shown are for respondents who reported that they engaged in the outcome. Respondents who: (1) reported any type of sex (anal, oral, vaginal) in the past 12 months, and (2) who reported ever engaging in the relevant type of sex were included for each outcome. Each cell represents the proportion of people in a given group who reported “yes” to engaging in that sexual behavior. N varies by bivariate comparison given differences in missing data.