



Published in final edited form as:

Sex Transm Dis. 2025 June 01; 52(6): 325–332. doi:10.1097/OLQ.0000000000002134.

Comparison of *Chlamydia trachomatis* Seroprevalence and Risk Factors for Infection Among Women by Gender/Sex of Sex Partner, United States, 2013–2016

Keely S. Paris, MPH¹, Christine M. Khosropour, PhD², Jennifer E. Balkus, PhD³, Mary Bridget Waters, MS⁴, Kristen M. Kreisel, PhD⁵, Lisa E. Manhart, PhD⁶

¹Department of Epidemiology, School of Public Health, University of Washington, Seattle, WA at the time this work was completed. Currently at Washington State Department of Health, Shoreline, WA

²Department of Epidemiology, School of Public Health, University of Washington, Seattle, WA

³Department of Epidemiology, School of Public Health, University of Washington, Seattle, WA at the time this work was completed. Currently at Public Health – Seattle & King County, Seattle, WA.

⁴Department of Epidemiology, School of Public Health, University of Washington, Seattle, WA

⁵Division of STD Prevention, National Center for HIV, Viral Hepatitis, STD, and TB Prevention, Centers for Disease Control and Prevention, Atlanta, GA

⁶Department of Epidemiology, School of Public Health, and the Center for AIDS and STD, University of Washington, Seattle, WA

Abstract

Objectives: Women who report sex with women are thought to have lower risk for *Chlamydia trachomatis* (CT) infection than women who report sex with men only (WSM-only), but comparisons of lifetime burden are limited.

Methods: Among 1,418 sexually-experienced women aged 18–39 years participating in the National Health and Nutrition Examination Survey (2013–2016), we estimated weighted CT seroprevalence and Wald-based 95% confidence intervals (CI) in women who reported ever having sex with a woman (all reported having sex with men also) (WSWM) compared to WSM-only. We defined seropositivity as detection of Pgp3 antibodies and used stratified Poisson regression with robust standard errors to estimate prevalence ratios (PRs).

Results: Over half (58.3%) were White non-Hispanic; 16.2% were WSWM. WSWM were somewhat younger (mean=27.8 vs. 29.0 years, $p=0.07$), younger at sexual debut (mean=15.6 vs.

Corresponding Author: Lisa E. Manhart, PhD, Center for AIDS & STD, Box 325 9th Avenue, Seattle, WA 98104, lmanhart@uw.edu. Fax: 206-744-3693.

Notes: This work was performed while KSP and JEB were at the University of Washington. KSP is currently at the Washington State Department of Health and JEB remains affiliated with the University of Washington but is currently full-time at Public Health – Seattle & King County.

Disclaimer: The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

17.5 years, $p<0.001$), and had more lifetime male sexual partners (mean=15.9 vs. 6.4, $p<0.001$) than WSM-only. Weighted CT seroprevalence was 38.9% (95%CI=30.4–47.4) in WSWM and 28.6% (95%CI= 24.4–32.9) in WSM-only. Correlates of higher CT seroprevalence in both groups were Black non-Hispanic race/ethnicity, Hispanic ethnicity, and CT infection in the prior year. Having ≥ 5 lifetime male partners compared to 1–2 partners was associated with higher seroprevalence among WSWM (PR=4.5; 95%CI=1.77–11.44) and WSM-only (PR=2.7; 95%CI=1.87–3.69). Among WSWM, bisexual identity was associated with lower seroprevalence. Among WSM-only, low income and younger age at sexual debut were associated with higher seroprevalence.

Conclusion: Lifetime CT burden was higher in WSWM than WSM-only. Number of lifetime male partners was the strongest predictor of seropositivity for WSWM.

Summary:

Chlamydia seroprevalence was higher in women who reported ever having female sex partners than those reporting only male partners (38.9% versus 28.6%).

Keywords

Chlamydia trachomatis; seroprevalence; women who have sex with women; sexual minority

INTRODUCTION

Chlamydia trachomatis (CT) was added to the United States (US) Nationally Notifiable Conditions List in 1995 and case reports have increased over time, with the highest burden of infection among 15–24 year olds.¹ Most prior research on CT has been conducted among cisgender adolescent and young women who have sex with men (WSM) and cisgender men who have sex with men (MSM), leaving cisgender women and other individuals assigned female sex at birth who have sex with women (WSW) understudied.^{2,3}

In people with a uterus, untreated CT infections can lead to serious complications, including pelvic inflammatory disease (PID), which may lead to ectopic pregnancy, tubal factor infertility, and chronic pelvic pain.⁴ Despite the potential for severe sequelae, CT infection is often asymptomatic; therefore, the US Preventive Services Task Force recommends annual screening for all “sexually active women younger than 25 and women ≥ 25 years with increased risk of infection”.⁴ WSW are often missed in CT screening efforts because of perceptions that their risk of exposure is lower than cisgender women who have sex with men (WSM).^{2,5} However, in internet and venue-based surveys among WSW, self-reported lifetime STI prevalence in WSW was approximately 20%.^{3,6} In a separate assessment of nearly 10,000 family planning clinic visits, CT infection detected by nucleic acid amplification testing (NAAT) was the same in women who have sex with women only (WSW-only) as in women who had sex with women and men (WSWM) (7.1% for both), and slightly higher than in women who had sex with men only (WSM-only, 5.3%).⁷

Although most data on sex of sex partners are over a decade old, existing studies indicate that 75–97% of WSW have ever had a male sexual partner.^{2,8,9} Additionally, like WSM, WSW engage in behaviors that may increase the likelihood of STI exposure, including

transactional sex, substance use, inconsistent condom use, and sharing sex toys.^{3,5,10,11} STI transmission has also been documented between female sex partners regardless of history with male sex partners,² although the transmission probability is likely lower.

Serologic assays detect the presence of anti-CT antibody, capturing prior CT infection,¹² and can provide a better estimate of lifetime CT infection than self-report or single point-in-time NAAT testing. The National Health and Nutrition Examination Survey (NHANES) includes data on the presence of antibodies to CT in serum specimens from women aged 14–39 years participating in the 2013–2014 and 2015–2016 cycles (neither gender identity nor birth sex were elicited so we use the terms *male* or *men* and *female* or *women* to represent the response option available to the respondent). Although two prior analyses of these data reported population-level CT seroprevalence in women,^{13,14} no detailed information about WSW and factors associated with the presence of anti-CT antibody were included. We analyzed NHANES data from 2013–2016 to estimate and compare CT seroprevalence in women who reported ever having sex with a woman to that in women who had male sex partners only (WSM-only). We also identified characteristics associated with prior CT infection in each group.

METHODS

Study Design

NHANES participants are selected using complex, multistage probability sampling to create a nationally representative sample of the non-institutionalized, civilian population in the US.¹⁵ Data collection involves three parts: an in-home, face-to-face interview by a trained interviewer using computer assisted personal interviewing (CAPI); a standardized physical examination in a mobile examination center (MEC); and a self-administered interview using audio computer-assisted self-interviewing (ACASI) completed in a private room in the MEC. The in-home interview includes questions about demographics, socioeconomic characteristics, diet, and other health-related issues. Sensitive questions about sexual behavior were asked in the MEC using ACASI. Biological specimens (including urine, blood, and vaginal/penile swabs) were collected during the physical examination and stored at –80°C until assaying.

Measures

In the 2013–2016 cycles of NHANES, participants were asked “*Have you ever had any kind of sex with a woman? By sex, we mean contact with another woman’s vagina or genitals*”. History of sex with men was derived from 3 questions: “*Have you ever had vaginal sex with a man?*”, “*Have you ever performed oral sex on a man?*”, and “*Have you ever had anal sex with a man?*”. Women who answered “*Yes*” to ever having had sex with a man and “*No*” to ever having had sex with a woman were considered WSM-only. Most women who reported ever having sex with a woman also reported sex with men and were categorized as women who have sex with women and men (WSWM). Only seven women reported exclusively female partners. As this small number did not meet NHANES data reporting standards¹⁶ these women were excluded, as were women who reported never having any kind of sex with either a man or a woman.

Prior infection with CT was determined by the detection of immunoglobulin G (IgG) antibodies to the CT plasmid gene protein 3 (Pgp3) using an enzyme linked immunosorbent assay (ELISA). This captures prior infection with CT for which sufficient time had passed for an antibody response to develop. A positive result was defined as a normalized absorbance value greater than 0.303 at 450 nm, the cutoff for which was established using a receiver operating characteristic (ROC) panel.¹⁷

We assessed factors that have been previously associated with CT or other STIs among cisgender women,^{2,3,6,7,11,13,14,18–20} including age (one year increments and categories of 18–24, 25–29, 30–34, 35–39); educational attainment (< high school; high school graduate/GED recipient; some college/associate's degree; ≥college graduate); and income-poverty ratio (above or below the low-income threshold [$<130\%$ of the federal poverty level in 2013–2014; $<185\%$ of the federal poverty level in 2015–2016]¹⁶). NHANES participants self-reported their race and Hispanic ethnicity as required by the Department of Health and Human Services policy on the inclusion of racial and ethnic categories in survey research.²¹ We categorized race/Hispanic ethnicity as Asian non-Hispanic, Black non-Hispanic, Hispanic [including Mexican American and “other Hispanic ethnicities”], White non-Hispanic, and Another race/ethnicity [this NHANES-derived “other” category includes multiracial and all other racial/ethnic identities]. Sexual behavior characteristics included age at sexual debut (one year increments and categories of ≤ 13 , 14–15, 16–17, ≥ 18 years of age); lifetime number of male and female sex partners (per partner increments and categories of 0, 1–2, 3–4, ≥ 5); frequency of condomless penile-vaginal or penile-anal sex in the past year (never, less than half the time, about half the time, more than half the time, always); history of CT within the past year (told by a doctor they had CT or had a positive urine NAAT test for CT at the time of the NHANES interview); self-reported diagnosis of another STI (ever HPV, genital warts, or genital herpes; diagnosed with gonorrhea in the past year); and sexual identity (straight, lesbian or gay, bisexual, other). Although response options for sexual identity changed slightly between cycles, these changes did not substantively alter most participants' understanding of the answer choices, and we used the categorization from the 2015–2016 cycle.²³

Data Analysis

We calculated weighted estimates using the 2013–2014 and 2015–2016 MEC sample weights and dividing the 2-year sample weights by two based on NHANES guidelines for combining two cycles.¹⁶ We compared characteristics of WSWM and WSM-only and estimated the weighted CT seroprevalence by sociodemographic and sexual behavior characteristics within each group. We used modified univariate Poisson regression to identify factors associated with reporting female sex partners (WSWM) relative to only reporting male partners (WSM-only), and to estimate prevalence ratios (PR) and Wald-based 95% confidence intervals (CI) for the association of each factor with CT seropositivity.

All analyses were done using R statistical software and the ‘survey’ package. The University of Washington Institutional Review Board (IRB) determined that this work was not human subjects research and did not require IRB approval.

RESULTS

Overall, 19,357 people participated in the MEC examinations and completed questionnaires in the 2013–2014 and 2015–2016 NHANES cycles, of whom 9,850 reported female sex. CT serology was performed on serum samples from 1,724 women aged 18–39 years who had CT NAAT results. We excluded 101 women who reported never having any type of sex, 198 women who either refused to answer or were missing data on whether they had ever had sex with a woman, and the seven WSW-only for whom estimates would have to be suppressed, leaving 1,418 sexually-experienced women aged 18–39 years in this analysis (none were missing data on whether they had sex with men).

Characteristics of WSWM compared to WSM-only

Of the 1,418 included women, 1,207 (83.6%) were WSM-only and 211 (16.2%) were WSWM. The overall population was majority White non-Hispanic (58.3%) and had completed at least some college (68.6%, Table 1). Over 60% had an income above the federal poverty level.

WSWM were somewhat younger than WSM-only (mean age 27.8 vs 29.0, $p=0.07$), and 18–24-year-olds were proportionally the largest age strata for both groups (32.9% WSWM; 28.2% WSM-only, Table 1). The proportion of Hispanic women was smaller among WSWM than among WSM-only (13.8% vs 22.4%). In contrast, the proportion of women with high school or some college education and living below the federal poverty level was higher among WSWM than among WSM-only (72.3% and 45.0% vs 55.1% and 34.4%, respectively). WSWM were significantly younger at sexual debut than WSM-only (mean 15.6 vs. 17.5, $p<0.001$) and the proportion of women whose first sexual experience occurred at ≤ 13 years was five times higher among WSWM compared to WSM-only ($PR=5.1$; 95% $CI=3.55-7.32$). WSWM reported an average of 3.1 lifetime female partners and more lifetime male partners than WSM-only (mean 15.9 vs 6.4, $p<0.0001$). Most WSM-only identified as straight (97.1%). In contrast, 47.4% of WSWM identified as bisexual, 43.6% identified as straight; and 7.8% identified as lesbian or gay.

CT Seroprevalence

The overall weighted CT seroprevalence among all women was 30.3% (95% $CI=25.6-33.0$), similar to previously reported estimates including WSW-only.¹³ Among WSWM, CT seroprevalence was 38.9% (95% $CI=30.4-47.4$) whereas it was 28.6% (95% $CI=24.4-32.9$) among WSM-only (Table 2). Overall, CT seroprevalence was 1.4 times higher in WSWM compared to WSM-only ($PR=1.4$; 95% $CI=1.14-1.62$).

Characteristics Associated with CT Seropositivity Among WSM-only and WSWM

CT seropositivity was highest in women who had CT in the past year (WSWM=68.3%; WSM-only=76.9%) (Table 2). Seroprevalence was similarly high in Black non-Hispanic women (WSWM=67.6%; WSM-only= 62.1%) and lowest in those who reported only 1–2 lifetime male sexual partners (WSWM=9.4%; WSM-only=15.5%).

CT seropositivity was 2–3 times higher among Black non-Hispanic women (WSWM PR=2.2; 95% CI=1.39–3.58; WSM-only PR=2.9; 95% CI=2.22–3.72) and 1.5 times higher among Hispanic women (WSWM PR=1.5; 95% CI=0.86–2.54; WSM-only PR=1.5; 95% CI=1.15–1.92) versus White non-Hispanic women. CT seroprevalence was 3–4 times higher among women reporting ≥ 5 versus 1–2 lifetime male partners (WSWM PR=4.5; 95% CI=1.77–11.44; WSM-only PR=2.7; 95% CI=1.87–3.69). It was also 2–3 times higher in women who had CT in the past year compared to women who had not had CT (WSWM PR=1.9; 95% CI=1.21–2.81; WSM-only PR=2.9; 95% CI=2.26–3.60) (Table 3).

Among WSWM but not WSM-only, CT seropositivity was lower among those who identified as bisexual versus straight (PR=0.6; 95% CI=0.37–0.93). In contrast, CT seropositivity among WSM-only but not WSWM was higher among those with income below versus above the poverty threshold (PR=1.7; 95% CI=1.31–2.14). CT seroprevalence was also 2–4 times higher among WSM-only whose first sexual experience occurred at ≤ 13 years (PR=3.8; 95% CI=2.68–5.50), at 14–15 years (PR=2.8; 95% CI=2.11–3.70), and at 16–17 years (PR=2.1; 95% CI=1.61–2.80) than WSM-only who initiated sexual activity at ≥ 18 years.

DISCUSSION

In this nationally-representative, population-based survey, CT seroprevalence in WSWM (38.9%) was higher than in WSM-only (28.6%). Both groups had common correlates of seropositivity including Black non-Hispanic race/ethnicity, Hispanic ethnicity, more lifetime male sex partners, and CT infection in the past year. The strongest predictor of CT seropositivity for WSWM was the lifetime number of male sex partners (4.5 times higher in WSWM with ≥ 5 lifetime male partners than WSWM with 1–2 partners). Additionally, bisexual identity was associated with lower seroprevalence in WSWM. Among WSM-only, low income, and young age at sexual debut were associated with higher CT seroprevalence and the strongest predictor of CT seropositivity was young age at sexual debut (3.8 times higher among WSM-only who were ≤ 13 years than WSM-only who were ≥ 18 years of age).

WSWM and WSM-only in NHANES 2013–2016 differed in several ways. WSWM were younger and a lower proportion had a college education than WSM-only. WSWM had more lifetime male partners and were significantly younger at sexual debut than WSM-only. This is consistent with reports among WSWM in other populations^{8,10,11} and women who report only female partners may differ. The high CT seroprevalence that we observed in WSWM with more lifetime male sex partners emphasizes the role that sex with men has in acquiring CT infection. Several reports have demonstrated higher STI prevalence among WSWM than WSM-only, including among women attending urban sexual health clinics in Baltimore, MD¹¹, and Black women attending a Mississippi sexual health clinic.²⁰ More male partners have been associated with higher STI risk in other settings as well,²⁴ likely attributable to more efficient transmission during penile-vaginal sex, higher background CT prevalence in WSWM sexual-partner pools, or a mixture of both.

Black non-Hispanic race/ethnicity was reported equally by WSWM and WSM-only and associated with CT seropositivity in both groups; seroprevalence in Black non-Hispanic

women was 2.2 to 2.9 times higher than seroprevalence in White non-Hispanic women. Dramatically higher prevalence of both acute and lifetime CT among Black women in general¹ and among Black women who report recent sex with women has been previously reported,^{3,22,25} and could partly be due to high CT prevalence in sexual networks. Importantly, it highlights disparities in sexual healthcare delivery, often due to institutionalized racism, sexism, and homophobia faced by Black WSW which manifest in unequal access to screening and preventive health services, decreased access to affordable health insurance, and stigma from healthcare providers.^{3,6}

Although few studies of CT infection or other STIs among WSW have measured lifetime prevalence using serology, several have measured lifetime STI risk using self-reported diagnoses. In these studies, the lifetime STI prevalence in WSW, many of whom also reported male partners, was around 20%.¹⁴ This is lower than our CT seroprevalence estimates based on detection of Pgp3 antibodies and is likely explained by the additional undiagnosed infections that serology captures. Earlier analyses of NHANES 2013–2016 that considered sexual identity/orientation used an alternative seroassay, the Pgp3 multiplex bead array (MBA) assay, and stratified results by high and low median fluorescence intensity as a marker of Pgp3 antibody levels. Among all women (WSW-only and WSWM together) in this earlier analysis, both weighted low- and weighted high-seropositivity (30.6% and 10.5%, respectively)¹⁴ were lower than the seroprevalence that we observed among WSWM using the Pgp3 ELISA assay (weighted seropositivity=38.9%). This difference may be due to the variability between the two assays,^{13,26} or to the greater number of WSM-only in the population, attenuating the seroprevalence estimate for the combined group.

Although CT seroprevalence increased with age in British women participating in the British National Surveys of Sexual Attitudes and Lifestyles (Natsal),¹⁹ we did not observe a significant relationship between seropositivity and age in either group, similar to prior analyses of these data among all women.¹³ This may reflect the more limited age range in NHANES 2013–2016 (18–39 years) than in Natsal (16–44 years). Alternatively, CT antibody levels may wane with time and/or disappear (e.g., seroreversion). Öhman and colleagues found that the proportion of people with IgG antibodies from urogenital CT declined from 65.5% shortly after an incident infection to 34.5% 3–10 years later.²⁷ CT incidence is highest in women under 25,¹ and the CT Pgp3 ELISA may have preferentially identified more recent CT infections in younger women, failing to identify prior infections in some older women for whom over a decade had passed since their most recent infection.

Paradoxically, while a higher proportion of WSWM were under age 13 when they initiated sexual activity, age at sexual debut was only associated with CT seropositivity in WSM-only. Despite our stratified results, age at debut was associated with CT seroprevalence when all women were considered together¹³, consistent with findings among British women overall¹⁹ and reflects the larger number of WSM-only than WSWM in our NHANES population. The absence of association between condomless sex in the past year and CT seropositivity is likely because condom use was reported for the past 12 months, while seroprevalence is a long-term indicator of infection.

Almost half of WSWM in our population reported their sexual identity as straight, demonstrating the discordance between sexual behavior and sexual identity that has been characterized in other literature.^{8,28} Sexual identity has a complex and indirect relationship with sexual experience and many women who have had sexual experiences with other women identify as heterosexual or straight. In Australia, only 31% of women who reported ever having sexual experiences with women and feeling attraction towards women identified as bisexual or lesbian.²⁸ Consistent with this discordance, data on the association of sexual identity and likelihood of STI are conflicting. We observed lower CT seroprevalence in WSWM who identified as bisexual than those who identified as straight or lesbian, yet Canadian WSW who identified as bisexual were more likely to report ever having had an STI than WSW who identified as lesbian (whether women also had male partners was not specified).³ These differences could reflect the inclusion of asymptomatic infections captured by serology in NHANES, and the less frequent screening undergone by lesbian women in routine clinical care, perhaps due to perceived low risk. Clinicians assessing potential for CT exposure in their patients should use an inclusive approach, focusing on recent sexual history with partners of any gender/sex, irrespective of sexual identity.²⁹ STI prevention strategies and messaging for WSW should address the variety of sexual practices and identities in this group and clinicians should be trained to provide sexual healthcare free of stigma that might otherwise discourage WSW from seeking care.

The primary strengths of this study were the large, nationally-representative nature of NHANES and the ability to estimate lifetime infection using serology. Most prior studies of lifetime prevalence of CT in WSW have been conducted in specialized populations (clinics or convenience surveys) and have used self-reported data to define prior CT infection. The serology assay that we used is more sensitive and less biased than self-reported data.^{3,20} Pgp3 antigens are highly conserved across CT isolates and the corresponding IgG antibodies can persist for over 10 years in many cisgender women,^{12,27} enhancing their reliability as a measure of lifetime CT infection.

Our study also had limitations. First, seroreversion can occur and some women classified as CT seronegative may have previously had CT infection. Second, statistical power was limited for analyses of WSWM and the small number of WSW-only required us to exclude them from our analysis. The latter prevented us from examining differences between WSW-only and WSWM and from inferring whether WSWM were infected by male or female sex partners. However, the strong association with more male but not more female partners in WSWM suggests that substantial CT exposure occurred from male partners. Third, sex of sex partners and CT seropositivity were measured over a lifetime, yet condom use, income, and recent STI history were measured over more proximal timeframes. Sociobehavioral characteristics measured at one timepoint are often, but not always, good proxies for lifetime measures and associations with seropositivity should be interpreted in light of the timeframe defining them. Fourth, the lack of distinction between gender and sex assigned at birth in the survey design may have resulted in some misclassification. Transgender, non-binary and gender non-conforming individuals may not have been asked relevant sexual behavior questions due to sex-specific skip patterns. This misclassification has been present in other national surveys and may have resulted in some bias.³⁰ Fifth, our analyses were limited to non-institutionalized, civilian women ages 18–39 years. The exclusion of adolescents

and women above 40 limited generalizability. Sixth, if people who provided serum samples fundamentally differed from the general population, our estimates may be biased. Seventh, the cross-sectional design of NHANES prevents us from making conclusions related to causality.

In summary, WSWM had a substantial burden of lifetime CT infection that was higher than the lifetime burden of CT in WSM-only. The considerable differences in CT seroprevalence in WSWM by race/Hispanic ethnicity highlight the need to address the disparities that occur at the intersection of race/Hispanic ethnicity and sex/gender of sex partner. Clinicians should consider the heterogeneity in women described as WSW and assess common correlates of lifetime CT infection when evaluating the likelihood of exposure. Future research will need to oversample women who exclusively have sex with women to fully understand risk for CT infection in this group.

Sources of Funding and Conflicts of Interest:

This work was supported by the National Institutes of Health (grant number R01AI161019). LEM has received research support from Nabriva Therapeutics and research and travel support from Hologic, Inc for studies unrelated to this work. CMK has received research support from Hologic, Inc and Gilead Sciences, for studies unrelated to the submitted work. JEB has received consulting fees from proPharma and Ferring unrelated to this work.

References

- Centers for Disease Control and Prevention. Sexually Transmitted Disease Surveillance, 2022. US Department of Health and Human Services; 2024.
- Gorgos LM, Marrazzo JM. Sexually transmitted infections among women who have sex with women. *Clin Infect Dis*. 2011;53(suppl_3):S84–S91. [PubMed: 22080273]
- Logie CH, Navia D, Loutfy MR. Correlates of a lifetime history of sexually transmitted infections among women who have sex with women in Toronto, Canada: Results from a cross-sectional internet-based survey. *Sex Transm Infect*. 2015;91(4):278–283. [PubMed: 25477474]
- US Preventive Services Task Force. Screening for chlamydia and gonorrhea: US Preventive Services Task Force recommendation statement. *JAMA*. 2021;326(10):949–956. [PubMed: 34519796]
- Dolan KA, Davis PW. Nuances and shifts in lesbian women's constructions of STI and HIV vulnerability. *Soc Sci Med*. 2003;57(1):25–38. [PubMed: 12753814]
- Bauer GR, Welles SL. Beyond assumptions of negligible risk: Sexually transmitted diseases and women who have sex with women. *Am J Public Health*. 2001;91(8):1282–1286. [PubMed: 11499119]
- Singh D, Fine DN, Marrazzo JM. *Chlamydia trachomatis* infection among women reporting sexual activity with women screened in family planning clinics in the Pacific Northwest, 1997 to 2005. *Am J Public Health*. 2011;101(7):1284–1290. [PubMed: 20724697]
- Xu F, Sternberg MR, Markowitz LE. Women who have sex with women in the United States: Prevalence, sexual behavior and prevalence of herpes simplex virus type 2 infection—Results from National Health and Nutrition Examination Survey 2001–2006. *Sex Transm Dis*. 2010;37(7):407. [PubMed: 20531032]
- Mendoza-Pérez J, Ortiz-Hernández L, Lozano-Verduzco I. Sexual practices among a sample of young lesbian and bisexual women from Mexico: An exploratory study. *Int J Sex Health*. 2019;31(2):154–163.
- Mercer CH, Bailey JV, Johnson AM, et al. Women who report having sex with women: British national probability data on prevalence, sexual behaviors, and health outcomes. *Am J Public Health*. 2007;97(6):1126–1133. [PubMed: 17463372]
- Rahman N, Ghanem KG, Gilliams E, Page K, Tuddenham S. Factors associated with sexually transmitted infection diagnosis in women who have sex with women, women who have sex with

- men, and women who have sex with both. *Sex Transm Infect.* 2021;97(6):423–428. [PubMed: 33122425]
12. Wills GS, Horner PJ, Reynolds R, et al. Pgp3 antibody enzyme-linked immunosorbent assay, a sensitive and specific assay for seroepidemiological analysis of *Chlamydia trachomatis* infection. *Clin Vaccine Immunol CVI.* 2009;16(6):835–843. [PubMed: 19357314]
 13. Petersen MR, Patel EU, Grabowski MK, Gaydos CA, Quinn TC, Tobian AAR. Seroprevalence of *Chlamydia trachomatis* among female adults in the United States: The National Health and Nutrition Examination Surveys. *Clin Infect Dis.* 2020;73(3):e629–e637.
 14. Anyalechi GE, Hong J, Danavall DC, et al. High plasmid gene protein 3 (pgp3) *Chlamydia trachomatis* seropositivity, pelvic inflammatory disease, and infertility among women, National Health and Nutrition Examination Survey, United States, 2013–2016. *Clin Infect Dis.* 2021;73(8):1507–1516. [PubMed: 34050737]
 15. Johnson CL, Dohrmann SM, Burt VL, Mohadjer LK. National Health and Nutrition Examination Survey: Sample Design, 2011–2014. *Vital Health Stat 2.* 2014;(162):1–33.
 16. Centers for Disease Control and Prevention. The National Health and Nutrition Examination Survey: (NHANES) Analytic Guidelines, 2011–2014 and 2015–2016. National Center for Health Statistics Division of the National Health and Nutrition Examination Surveys; 2018. Accessed April 26, 2024. <https://wwwn.cdc.gov/nchs/data/nhanes/analyticguidelines/11-16-analytic-guidelines.pdf>
 17. Centers for Disease Control and Prevention. National Health and Nutrition Examination Survey Laboratory Protocol. National Center for Health Statistics; 2015. Accessed April 26, 2024. https://wwwn.cdc.gov/nchs/data/nhanes/2013-2014/labmethods/CHLMDA_H_MET_CHLMDYDIA.pdf
 18. Torrone E, Papp J, Weinstock H. Prevalence of *Chlamydia trachomatis* genital infection among persons aged 14–39 years — United States, 2007–2012. *Morb Mortal Wkly Rep.* 2014;63(38):834–838.
 19. Woodhall SC, Wills GS, Horner PJ, et al. *Chlamydia trachomatis* pgp3 antibody population seroprevalence before and during an era of widespread opportunistic chlamydia screening in England (1994–2012). *PLoS One.* 2017;12(1):e0152810. [PubMed: 28129328]
 20. Muzny CA, Sunesara IR, Martin DH, Mena LA. Sexually transmitted infections and risk behaviors among African American women who have sex with women: Does sex with men make a difference? *Sex Transm Dis.* 2011;38(12):1118. [PubMed: 22082722]
 21. Policy Statement on Inclusion of Race and Ethnicity in DHHS Data Collection Activities. Department of Health and Human Services. Accessed April 26, 2024. <https://aspe.hhs.gov/collaborations-committees-advisory-groups/hhs-data/hhs-data-council-introduction/dc-archive/policy-statement-inclusion-race-ethnicity-dhhs-data-collection-activities>
 22. Hogben M, Leichter JS. Social determinants and sexually transmitted disease disparities. *Sex Transm Dis.* 2008;35(12 Suppl):S13–S18. [PubMed: 18936725]
 23. Dahlhamer J, Galinsky A, Joestl S, Ward B. Sexual Orientation in the 2013 National Health Interview Survey: A Quality Assessment. 2014;(169).
 24. Engel JL, Fairley CK, Greaves KE, et al. Patterns of sexual practices, sexually transmitted infections and other genital infections in women who have sex with women only (WSWO), women who have sex with men only (WSMO) and women who have sex with men and women (WSMW): Findings from a sexual health clinic in Melbourne, Australia, 2011–2019. *Arch Sex Behav.* 2022;51(5):2651–2665. [PubMed: 35776396]
 25. Prather C, Fuller TR, Jeffries WL, et al. Racism, African American women, and their sexual and reproductive health: A review of historical and contemporary evidence and implications for health equity. *Health Equity.* 2018;2(1):249–259. [PubMed: 30283874]
 26. Waters MB, Hybiske K, Ikeda R, Kaltenboeck B, Manhart LE, Kreisel KM, Khosropour CM. *Chlamydia trachomatis* serological assays: a narrative review of function, strengths, limitations, and use in epidemiological research. *J Infect Dis.* 2024;230(1):250–262. [PubMed: 39052727]
 27. Öhman H, Rantsi T, Joki-Korpela P, Tiitinen A, Surcel HM. Prevalence and persistence of *Chlamydia trachomatis*-specific antibodies after occasional and recurrent infections. *Sex Transm Infect.* 2020;96(4):277–282. [PubMed: 31320394]

28. Smith AMA, Rissel CE, Richters J, Grulich AE, de Visser RO. Sex in Australia: Sexual identity, sexual attraction and sexual experience among a representative sample of adults. *Aust N Z J Public Health*. 2003;27(2):138–145. [PubMed: 14696704]
29. Reno H, Park I, Workowski K, Machefsky A, Bachmann L. A Guide to Taking a Sexual History. *Cent Dis Control Prev*. 30–0166. Accessed April 26, 2024. <https://www.cdc.gov/std/treatment/sexualhistory.pdf>
30. Tordoff D, Andrasik M, Hajat A. Misclassification of sex assigned at birth in the behavioral risk factor surveillance system and transgender reproductive health: A quantitative bias analysis. *Epidemiology*. 2019;30(5):669. [PubMed: 31162292]

Table 1:

Characteristics of Women Who Have Had Sex with Men Only (WSM-only) Compared to Characteristics of Women Who Have Had Sex with Women and Men (WSWM) Aged 18 to 39 Years Participating in the National Health and Nutrition Examination Survey (NHANES), 2013–2016 Cycles.

Characteristic	Overall	WSM-only	WSWM	Association with WSWM (relative to WSM-only)	
	N (weighted %)	N ¹ (weighted %)	N ¹ (weighted %)	Univariable PR (95% CI)	P-value *
Overall	1,418	1,207 (83.8)	211 (16.2)	-	-
Age, years					
Mean ($\pm$ SE)	-	29.0 ($\pm$ 0.27)	27.8 ($\pm$ 0.57)	-	0.07 ⁺
18–24	452 (29.0)	382 (28.2)	70 (32.9)	1.40 (0.84, 2.34)	0.24
25–29	316 (24.5)	260 (24.1)	56 (27.0)	1.32 (0.81, 2.14)	0.26
30–34	322 (22.9)	273 (23.4)	49 (20.4)	1.07 (0.62, 1.84)	0.81
35–39	328 (23.6)	292 (24.4)	36 (19.7)	1.0 (ref)	-
Race/Hispanic ethnicity					
Asian non-Hispanic	138 (5.0)	127 (5.4)	<i>a</i>	<i>a</i>	<i>a</i>
Black non-Hispanic	258 (11.0)	205 (10.3)	53 (14.3)	1.18 (0.84, 1.66)	0.32
Hispanic ²	441 (21.0)	398 (22.4)	43 (13.8)	0.60 (0.40, 0.89)	0.01
White non-Hispanic	504 (58.3)	413 (57.2)	91 (64.3)	1.0 (ref)	-
Another ²	79 (4.8)	64 (4.7)	15 (5.1)	0.99 (0.54, 1.82)	0.97
Education level					
Less than high school	239 (12.4)	210 (12.8)	29 (10.2)	1.38 (0.90, 2.13)	0.13
High school graduate/GED	308 (19.0)	257 (17.6)	51 (26.1)	2.32 (1.41, 3.82)	0.002
Some college/Associates degree	532 (38.9)	436 (37.5)	96 (46.2)	2.01 (1.36, 2.96)	0.001
College graduate or above	339 (29.7)	304 (32)	35 (17.6)	1.0 (ref)	-
Household income-poverty ratio³					
Below low-income threshold	606 (36.1)	499 (34.4)	107 (45.0)	1.45 (1.05, 1.99)	0.03
Above low-income threshold	739 (63.9)	643 (65.6)	96 (55.0)	1.0 (ref)	-
Age at sexual debut, in years⁴					
Mean ($\pm$ SE)	-	17.5 ($\pm$ 0.13)	15.6 ($\pm$ 0.17)	-	<0.001 ⁺
≤ 13	107 (6.5)	63 (4.5)	44 (17.0)	5.10 (3.55, 7.32)	<0.0001
14–15	320 (21.6)	257 (20.1)	63 (29.9)	2.69 (1.91, 3.79)	<0.0001
16–17	452 (33.2)	384 (33.2)	68 (33.3)	1.95 (1.33, 2.84)	0.001
≥ 18	539 (38.6)	503 (42.2)	36 (19.8)	1.0 (ref)	-
# lifetime male sex partners					
Mean ($\pm$ SE)	-	6.4 ($\pm$ 0.3)	15.9 ($\pm$ 1.4)	-	<0.001 ⁺
0	0 (0)	0 (0)	0 (0)	-	-
1–2	474 (31.1)	453 (35.3)	21 (9.2)	1.0 (ref)	-
3–4	248 (16.4)	229 (17.7)	19 (9.7)	2.01 (1.08, 3.73)	0.03
≥ 5	696 (52.5)	525 (47.0)	170 (81.1)	5.23 (3.04, 9.00)	<0.0001
# lifetime female sex partners					

Characteristic	Overall	WSM-only	WSWM	Association with WSWM (relative to WSM-only)	
	N (weighted %)	N ¹ (weighted %)	N ¹ (weighted %)	Univariable PR (95% CI)	P-value *
Mean (±SE)	-	0	3.1 (±0.33)	-	-
0	1,207 (83.8)	1,207 (100)	0 (0)	-	-
1–2	126 (9.9)	-	126 (61.6)	-	-
3–4	51 (3.6)	-	51 (15.9)	-	-
≥5	33 (2.6)	-	33 (15.9)	-	-
Frequency of condomless sex in last year ⁴					
Never	273 (17.8)	241 (18.6)	32 (13.7)	1.0 (ref)	-
Less than half the time	234 (15.9)	204 (16.1)	30 (14.4)	1.18 (0.72, 1.94)	0.50
About half the time	97 (6.6)	82 (6.7)	15 (5.8)	1.15 (0.54, 2.43)	0.71
More than half the time	155 (12.4)	122 (11.4)	33 (17.7)	1.85 (1.13, 3.05)	0.02
Always	561 (47.3)	476 (47.1)	85 (48.4)	1.33 (0.85, 2.08)	0.20
History of HSV, genital warts, HPV, gonorrhea ⁵					
Yes	205 (17.3)	158 (15.8)	47 (25.4)	1.63 (1.25, 2.11)	0.001
No	1,211 (82.7)	1,047 (84.2)	164 (74.6)	1.0 (ref)	-
Chlamydia in the past year ⁶					
Yes	68 (3.8%)	53 (3.3)	15 (6.0)	1.64 (1.25, 2.36)	0.01
No	1,348 (96.2%)	1,152 (96.7)	196 (94.0)	1.0 (ref)	-
Sexual identity ⁷					
Straight	1,226 (88.4)	1,140 (97.1)	86 (43.6)	1.0 (ref)	-
Lesbian or gay	20 (1.3)	0 (0)	20 (7.8)	12.48 (10.02, 15.54)	<0.0001
Bisexual	128 (10.0)	32 (2.7)	96 (47.4)	9.64 (7.56, 12.31)	<0.0001
Another identity	10 (0.4)	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>

* P-values derived using univariate Poisson regression unless otherwise specified

⁺ P-value derived from weighted t-test

^a Relative standard error >30% but <40%; interpret with caution.

¹ Count data are unweighted, but all proportions are weighted using NHANES medical examination center (MEC) weights.

² “Hispanic” includes Mexican American and participants of other Hispanic ethnicity; the NHANES “Other” category includes multiracial, and all other race/ethnicity categories. NHANES public-release data do not disaggregate the “other” race/ethnicity categories and do not provide counts for people who identify as American Indian Alaska Native or Hawaiian or other Pacific Islander due to small sample sizes and concerns about deductive disclosure.

³ Income threshold for low-income was 130% FPL in the 2013–2014 cycle and 185% FPL in the 2015–2016 cycle. “Below low-income threshold” corresponds to being below 130% FPL for participants in the 2013–2014 cycle and being below 185% FPL in the 2015–2016 cycle.

⁴ Information on past year condom use was only asked to individuals who reported vaginal or anal sex in the past year.

⁵ History of HSV, HPV, or gonorrhea defined as ever being told by a doctor that they had HSV, genital warts, or HPV, or being told by a doctor within the last year that they had gonorrhea.

⁶ “Yes” includes those who were either told by a doctor within the last year that they had chlamydia, or tested positive on a urine CT NAAT at the time of examination

⁷ Between the 2013–2014 and 2015–2016 cycles, NHANES changed the possible answers for the sexual identity question: “Do you think of yourself as . . .”. In 2013–2014, the answer options were: “Heterosexual or straight (attracted to men)”, “Homosexual or lesbian (attracted to women)”, “Bisexual (attracted to men and women)”, “Something else”, “Not sure”, “Refused”, and “Don’t know”. In 2015–2016, the answer options were: “Lesbian or gay”, “Straight, that is, not lesbian or gay”, “Bisexual”, “Something else”, “Not sure”, “Refused”, and “Don’t know”. For our analyses, those who answered “heterosexual” or “straight” were classified as straight, those who answered “homosexual” or “lesbian or gay” were lesbian or gay, those who answered “bisexual” were bisexual, and those who answered “something else” were classified as another.

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

Table 2.

Chlamydia Seroprevalence and Associated Characteristics among Women Who Have Had Sex with Men Only (WSM-only) and Women Who Have Had Sex with Women and Men (WSWM) Aged 18 to 39 Years in NHANES 2013–2016 Cycles

Characteristic	CT Seropositivity							
	WSM-only (n=1207)				WSWM (n=211)			
	N	Weighted Seroprevalence (95% CI)	Prevalence Ratio (95% CI)	P value *	N	Weighted Seroprevalence (95% CI)	Prevalence Ratio (95% CI)	P value *
Overall	1,207	28.6 (24.4, 32.9)	1.0 (ref)	-	211	38.9 (30.4, 47.4)	1.36 (1.14, 1.62)	0.002
Age group, years								
18–24	382	30.5 (24.9, 36.1)	0.97 (0.75, 1.25)	0.78	70	30.2 (16.2, 44.1)	0.73 (0.42, 1.28)	0.26
25–29	260	24.6 (17.9, 31.3)	0.78 (0.53, 1.15)	0.20	56	43.5 (31.0, 56.0)	1.06 (0.62, 1.79)	0.83
30–34	273	27.6 (21.2, 34.0)	0.87 (0.66, 1.15)	0.32	49	44.6 (26.3, 63.0)	1.08 (0.62, 1.84)	0.76
35–39	292	31.6 (23.9, 39.3)	1.0 (ref)	-	36	41.2 (25.4, 57.0)	1.0 (ref)	-
Race/Hispanic ethnicity								
Asian Non-Hispanic	127	15.7 (10.0, 21.4)	0.73 (0.46, 1.14)	0.16	c	c	c	c
Black Non-Hispanic	205	62.1 (53.9, 70.4)	2.87 (2.22, 3.72)	<0.005	53	67.6 (53.6, 81.6)	2.23 (1.39, 3.58)	0.002
Hispanic ¹	398	32.3 (27.8, 36.6)	1.49 (1.15, 1.92)	0.003	43	44.9 (30.1, 59.8)	1.48 (0.86, 2.54)	0.15
White Non-Hispanic	413	21.6 (16.6, 26.6)	1.0 (ref)	-	91	30.3 (18.7, 42.0)	1.0 (ref)	-
Another race/ethnicity ¹	64	38.6 (19.2, 58.0)	1.78 (1.05, 3.02)	0.03	15	58.9 (24.2, 93.5) ^d	1.94 (0.96, 3.93) ^d	0.06 ^d
Education level								
Less than high school	210	38.6 (30.4, 46.8)	2.03 (1.45, 2.85)	<0.001	29	39.5 (18.2, 60.9)	1.45 (0.53, 4.02)	0.46
High school graduate/GED	257	35.7 (28.3, 43.0)	1.88 (1.37, 2.59)	<0.001	51	42.1 (26.5, 57.7)	1.55 (0.71, 3.40)	0.26
Some college / Associates degree	436	30.2 (24.6, 35.8)	1.59 (1.20, 2.12)	0.003	96	41.3 (30.6, 52.1)	1.52 (0.78, 2.96)	0.21
College graduate or above	304	19.0 (14.0, 24.0)	1.0 (ref)	-	35	27.2 (9.8, 44.5) ^d	1.0 (ref)	-
Household income-poverty ratio ²								
Below low-income threshold	499	37.9 (32.0, 43.8)	1.67 (1.31, 2.14)	<0.001	107	41.7 (29.4, 53.9)	1.13 (0.76, 1.69)	0.54
Above low-income threshold	643	22.6 (18.0, 27.2)	1.0 (ref)	-	96	36.9 (26.0, 47.8)	1.0 (ref)	-
Age at sexual debut, in years ³								
≤ 13	63	59.1 (46.1, 72.1)	3.84 (2.68, 5.50)	<0.0001	44	45.1 (28.4, 61.8)	1.71 (0.82, 3.58)	0.15
14–15	257	43.1 (36.8, 49.3)	2.80 (2.11, 3.70)	<0.0001	63	33.5 (20.6, 46.5)	1.21 (0.72, 2.06)	0.46

Characteristic	CT Seropositivity							
	WSM-only (n=1207)				WSWM (n=211)			
	N	Weighted Seroprevalence (95% CI)	Prevalence Ratio (95% CI)	P value*	N	Weighted Seroprevalence (95% CI)	Prevalence Ratio (95% CI)	P value*
16–17	384	32.7 (26.3, 39.0)	2.12 (1.61, 2.80)	<0.0001	68	47.2 (32.3, 62.1)	1.71 (0.85, 3.44)	0.13
≥18	503	15.4 (11.1, 19.7)	1.0 (ref)	-	36	27.6 (11.4, 43.8) ^a	1.0 (ref)	-
# Lifetime male sex partners								
0	0	0 (0)	-	-	0	0 (0)	-	-
1–2	453	15.5 (10.6, 20.4)	1.0 (ref)	-	21	9.4 (1.2, 17.6) ^a	1.0 (ref)	-
3–4	229	22.6 (16.5, 28.7)	1.46 (0.97, 2.18)	0.07	19	37.8 (11.9, 63.7) ^b	4.01 (1.24, 13.00) ^b	0.02
≥5	525	40.8 (34.4, 47.2)	2.67 (1.87, 3.69)	<0.0001	171	42.3 (32.8, 51.9)	4.50 (1.77, 11.44)	0.003
# Lifetime female sex partners								
0	1,207	28.6 (24.4, 32.9)	-	-	0	0 (0)	-	-
1–2	0	-	-	-	126	40.2 (30.4, 49.8)	1.0 (ref)	-
3–4	0	-	-	-	51	40.8 (24.4, 32.8)	1.02 (0.63, 1.65)	0.94
≥5	0	-	-	-	33	29.6 (12.4, 46.8)	0.74 (0.40, 1.35)	0.31
Frequency of condomless sex in last year ³								
Never	241	27.2 (19.9, 34.5)	1.0 (ref)	-	32	43.4 (22.8, 64.0)	1.0 (ref)	-
Less than half the time	204	33.4 (26.9, 39.9)	1.23 (0.87, 1.72)	0.23	30	46.7 (26.0, 67.4)	1.08 (0.54, 2.15)	0.83
About half the time	82	34.7 (21.7, 47.7)	1.28 (0.76, 2.14)	0.34	15	22.2 (2.4, 41.9) ^b	0.51 (0.18, 1.42) ^b	0.19 ^b
More than half the time	122	35.9 (27.0, 44.9)	1.32 (0.95, 1.83)	0.09	33	43.2 (22.6, 63.9)	1.00 (0.47, 2.11)	0.99
Always	476	25.7 (20.4, 30.9)	0.94 (0.70, 1.28)	0.70	85	37.0 (27.3, 46.7)	0.85 (0.50, 1.46)	0.54
Prior history of HSV, genital warts, HPV, or gonorrhea ⁴								
Yes	158	30.7 (23.6, 37.8)	1.09 (0.87, 1.35)	0.44	47	46.1 (28.2, 64.1)	1.27 (0.77, 2.81)	0.34
No	1,047	28.2 (23.9, 32.5)	1.0 (ref)	-	170	35.7 (26.0, 45.5)	1.0 (ref)	-
Chlamydia in the past year ⁵								
Yes	53	76.9 (61.1, 92.7)	2.85 (2.26, 3.60)	<0.0001	15	68.3 (38.5, 98.1)	1.85 (1.21, 2.81)	0.006
No	1,152	27.0 (22.8, 31.1)	1.0 (ref)	-	196	37.0 (28.9, 46.3)	1.0 (ref)	-
Sexual identity ⁶								
Straight	1,140	29.1 (24.7, 33.4)	1.0 (ref)	-	86	48.1 (37.7, 58.5)	1.0 (ref)	-

Characteristic	CT Seropositivity							
	WSM-only (n=1207)				WSWM (n=211)			
	N	Weighted Seroprevalence (95% CI)	Prevalence Ratio (95% CI)	P value *	N	Weighted Seroprevalence (95% CI)	Prevalence Ratio (95% CI)	P value *
Lesbian or gay	0	-	-	-	20	46.1 (19.7, 72.6)	0.96 (0.48, 1.92)	0.90
Bisexual	32	17.5 (3.3, 31.8) ^b	0.60 (0.26, 1.42) ^b	0.24 ^b	96	28.1 (15.7, 40.5)	0.58 (0.37, 0.93)	0.03
Another identity	5	c	c	c	6	51.6 (5.2, 97.9) ^b	0.92 (0.32, 2.65) ^b	0.89 ^b

* P-values derived using univariate Poisson regression unless otherwise specified

^aRelative standard error >30% but <40%; interpret with caution.

^bRelative standard error >40% but <50%; interpret with caution.

^cRelative standard error >50% or cell size <5, suppressed according to NCHS guidelines

¹“Hispanic” includes Mexican American and participants of other Hispanic ethnicity; the NHANES “Other” category includes multiracial, and all other race/ethnicity categories. NHANES public-release data do not disaggregate the “other” race/ethnicity categories and do not provide counts for people who identify as American Indian Alaska Native or Hawaiian or other Pacific Islander due to small sample sizes and concerns about deductive disclosure.

²Income threshold for low-income was 130% FPL in the 2013–2014 cycle and 185% FPL in the 2015–2016 cycle. “Below low-income threshold” corresponds to being below 130% FPL for participants in the 2013–2014 cycle and being below 185% FPL in the 2015–2016 cycle.

³Information on past year condom use was only asked to individuals who reported vaginal or anal sex in the past year.

⁴History of HSV, HPV, or gonorrhea defined as ever being told by a doctor that they had HSV, genital warts, or HPV, or being told by a doctor within the last year that they had gonorrhea.

⁵“Yes” includes those who were either told by a doctor within the last year that they had chlamydia, or tested positive on a urine CT NAAT at the time of examination

⁶Between the 2013–2014 and 2015–2016 cycles, NHANES changed the possible answers for the sexual identity question: “Do you think of yourself as . . .”. In 2013–2014, the answer options were: “Heterosexual or straight (attracted to men)”, “Homosexual or lesbian (attracted to women)”, “Bisexual (attracted to men and women)”, “Something else”, “Not sure”, “Refused”, and “Don’t know”. In 2015–2016, the answer options were: “Lesbian or gay”, “Straight, that is, not lesbian or gay”, “Bisexual”, “Something else”, “Not sure”, “Refused”, and “Don’t know”. For our analyses, those who answered “heterosexual” or “straight” were classified as straight, those who answered “homosexual” or “lesbian or gay” were lesbian or gay, those who answered “bisexual” were bisexual, and those who answered “something else” were classified as other.