

Chlamydia trachomatis Infection Among Women Reporting Sexual Activity With Women Screened in Family Planning Clinics in the Pacific Northwest, 1997 to 2005

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Chlamydia trachomatis is the most common bacterial sexually transmitted infection (STI) in the United States, with an estimated 4 million to 5 million cases reported annually to the Centers for Disease Control and Prevention (CDC).¹ *C trachomatis* has a major impact on women's sexual and reproductive health. Untreated infections can lead to pelvic inflammatory disease (PID), tubal infertility, and chronic pelvic pain. Because the majority of infections in women are asymptomatic and do not usually cause visible signs of cervicitis, CDC and the US Preventive Services Task Force recommend *C trachomatis* screening at least annually for all women aged 24 years and younger.^{2,3} In 1988, widespread screening for *C trachomatis* began in Alaska, Idaho, Oregon, and Washington (US Public Health Service Region X) in family planning clinics. This became the first chlamydia prevalence monitoring surveillance system to use standardized testing and data collection, and was the basis for the CDC's Infertility Prevention Project (IPP).⁴

According to the 2002 National Survey of Family Growth, 11% of US women aged 15 to 44 years reported same-sex sexual behavior in their lifetime.⁵ Despite the fact that same-sex sexual behavior is not infrequent among women in the United States and despite the widespread prevalence of *C trachomatis*, little data at the clinic, community, or population levels are available that describe the prevalence of *C trachomatis* among US women. Moreover, numerous studies support that more than 90% of women who self-identify as lesbian report a sexual history with men.⁶ Prior studies indicate that women who report same-sex sexual behavior, including exclusively same-sex behavior, acquire STIs, including genital types of human papillomavirus (HPV), HIV, genital herpes, and trichomoniasis.⁷⁻¹³ Moreover, bacterial vaginosis occurs

Objectives. We sought to define *Chlamydia trachomatis* positivity among women who report sexual activity with women, a population for which sparse data on this infection are available and for whom health disparities including challenged access to comprehensive sexual and reproductive health services, have been reported.

Methods. We analyzed data from 9358 family planning clinic visits with *C trachomatis* tests among women aged 15 to 24 years who reported sexual activity within the past year exclusively with women (WSW) or with men and women (WSMW), in the Region X Infertility Prevention Project. Characteristics were compared with women who reported sexual activity exclusively with men (WSM).

Results. *C trachomatis* positivity among both WSW and WSMW was 7.1%, compared with 5.3% among WSM. Behavioral risks were more commonly reported by WSW and WSMW, compared with reports by WSM. Risks for *C trachomatis* positivity were comparable across groups and included younger age, non-White race, behavioral risks, and clinical signs.

Conclusions. Higher *C trachomatis* positivity among women reporting same-sex sexual behavior supports investigation into potential explanatory factors, including sexual behaviors, biological susceptibility, routine *C trachomatis* screening disparities, sexual identity disclosure, and sexual network assessment. (*Am J Public Health.* 2010;101:1284-1290. doi:10.2105/AJPH.2009.169631)

commonly among women who report sexual activity with women, and there is a high degree of concordance among monogamous same-sex couples, suggesting a potential role for sexual transmission in this group.¹⁴ These observations emphasize the need for health care providers and public health advocates to address the sexual and reproductive health care needs of this group of women in a comprehensive and informed manner.

The purpose of our study was to describe the prevalence of and risks associated with chlamydial infection among women aged 15 to 24 years who reported same-sex sexual behavior and attended family planning clinics in the Region X IPP during the years 1997 through 2005. Since the project's inception in 1988, universal screening for *C trachomatis* has been recommended for family planning female clients in this age group.

METHODS

The 1997 to 2005 data set contained 604 616 *C trachomatis* test records with negative or positive laboratory results obtained from female clients aged 15 to 24 years seen at family planning clinics in Region X during this time period.

All clinics used a common medical record form and laboratory slip to record a standard set of information, including date of birth, race, ethnicity, specimen collection date, reason for visit (routine, experiencing symptoms, and exposure to a sexual partner with *C trachomatis*), clinical examination findings (cervical ectopy, friable cervix, PID, and cervicitis), self-reported sexual risk behaviors in the past 60 days (a new sexual partner, multiple sexual partners, and a symptomatic sexual partner), having had

chlamydia in the past year, *C trachomatis* diagnostic test type, and test result. Women were also asked whether they had had sexual intercourse in the past 12 months exclusively with men, exclusively with women, or with both men and women. We calculated age on the basis of client birth and specimen dates.

To describe participants' place of residence, we used a coding system based on the rural–urban commuting area (RUCA). These summary area measures of urbanization were downloaded for each zip code in Region X states. Detailed RUCA values were reduced to 4-category and dichotomized measures of urban or rural status. The RUCA zip code records were merged with individual IPP *C trachomatis* test records via the client's residential zip code.¹⁵

For the purposes of this analysis, we categorized women by report of sex of their recent sexual partners in the prior year: women who reported sexual activity exclusively with women (WSW), women who reported sexual activity with both men and women (WSMW), and women who reported sexual activity exclusively with men (WSM).

Laboratory Methods

C trachomatis testing was performed by 4 state public health laboratories (Alaska, Idaho, Oregon, and Washington), a county health district laboratory (Spokane, WA), and the University of Washington Chlamydia Laboratory (Seattle, WA). Half of the testing (49.3% overall) performed between 1997 and 2005 was nucleic acid amplification testing (NAAT) via ligase chain reaction tests (Abbott, Abbott Park, IL; 29%) and target capture transcription-mediated amplification assays (Aptima Combo 2, Gen-Probe, San Diego, CA; 21%). Non-NAAT included enzyme immunoassay (MicroTrak II, Syva, and Behring Diagnostic Products, Cupertino, CA; 29%), nucleic acid hybridization test (Pace 2, Gen-Probe, San Diego, CA; 10%), nucleic acid hybridization assays (Hybrid Capture 2, Digene, Gaithersburg, MD; 9%), and cell culture (3%).¹⁶ Of note, NAAT is considerably more sensitive relative to the other diagnostic tests used; sensitivities of the NAAT employed by the IPP for *C trachomatis* detection have been calculated from 96.0% to 100%; specificities range from 98.8% to 100%.¹⁷

Statistical Analyses

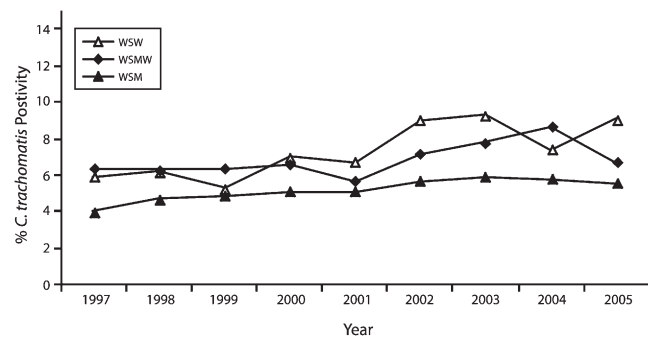
The principal outcome was *C trachomatis* positivity, defined as the number of positive tests divided by the sum of negative and positive tests. Positivity in family planning clinics is a good proxy for clinic-based prevalence.¹⁸ We analyzed relationships between chlamydial infection and individual characteristics including patient demographics, sexual behavioral risks, and clinical findings by using χ^2 testing with associated *P* values. We examined key measures (for example, partner's sex) for trends over time. Multivariate logistic regression models included covariates identified to be significant from univariate results, along with other descriptors that have been of interest in previous analyses of women attending IPP family planning clinics (for example, population density). We evaluated interactions between sexual partner (WSM, WSW, or WSMW) and each covariate. Because interactions were significant for multiple covariates, we generated sexual partner-specific models with associated adjusted odds ratios (AORs) and 95% confidence intervals (CIs). We performed 2-sided statistical tests, and *P* < .05 was considered significant. We performed analyses with SPSS version 14.5 (SPSS Inc, Chicago, IL).

RESULTS

Of the 604 616 chlamydia test records available for the study period, 98.5% (*n* = 595 258) were obtained among WSM and 1.5% (*n* = 9358) among women who reported

same-sex sexual behavior. Among the latter, 5714 cases (61%) occurred among WSW, and 3644 cases (39%) occurred among WSMW. By state, 48% of tests from women who reported same-sex sexual behavior were performed in Washington, 27% in Oregon, 17% in Idaho, and 8% in Alaska.

The number of WSM and WSMW who were tested for *C trachomatis* increased substantially over time. At the beginning of the study period in 1997, 54 761 and 266 tests occurred among WSM and WSMW, respectively. By contrast, in 2004, the year with the highest number of tests, 74 847 and 624 tests occurred among WSM and WSMW, respectively. Annual test volume among WSW fluctuated from 866 in 1997 down to 421 in 2002, then increased to 627 in 2005. Unadjusted *C trachomatis* positivity rate among WSW and WSMW was 7.1% versus 5.3% among WSM over the study period. Temporal trends in positivity, unadjusted for test type, are displayed in Figure 1. Differences in chlamydia positivity rates among WSW compared with WSM by year ranged from 5.3% versus 4.9% in 1999 to 4.6% versus 9.1% in 2005. Chlamydia positivity rates by year were higher for WSMW compared with WSM for all 9 years, with the lowest difference being in 2001 (5.7% vs 5.1%) and the highest in 2004 (8.7% vs 5.8%). The percentage of WSW who reported a symptomatic sexual partner in the 60 days prior to testing rose from 5.7% in 1997 to 9.4% in 2004 (*P* < .05). Among WSMW, positivity rates rose from



Note. WSM = women reporting sexual activity only with men; WSMW = women reporting sexual activity with both men and women; WSW = women reporting sexual activity only with women. Positivity unadjusted for test type.

FIGURE 1—Trends in *Chlamydia trachomatis* positivity rates among women aged 15 to 24 years in family planning clinics, by sex of reported sexual partner in the past year: Infertility Prevention Project, Region X (Alaska, Idaho, Oregon, and Washington), 1997–2005.

5.7% in 1997 to 7.8% in 2005, peaking at 8.7% in 2004. By contrast, positivity rates for chlamydia among WSM remained below 6.0% for all 9 years.

Table 1 shows the characteristics of all women screened for chlamydial infections in Region X family planning clinics between 1997 and 2005. Slightly fewer than half of all tests were conducted among women aged between 15 and 19 years. Consistent with prior research,¹⁹ these adolescent women had higher positivity rates than did young adult women aged 20 to 24 years. Among women aged 15 to 19 years, WSMW had the highest rate of chlamydia positivity relative to WSW and WSM.

Chlamydia positivity varied by race/ethnicity within each of the 3 groups of women. Compared with chlamydia positivity rates among White WSM, chlamydia positivity was 30% higher among Hispanics (6.0% vs 4.6%) and 120% higher among Blacks (10.1% vs 4.6%). Racial/ethnic disparities in chlamydia positivity rates were also found for WSW and WSMW, although the racial/ethnic group with highest rate of positivity varied. For example, among WSW the rate of chlamydia positivity was 14% higher among Asian/Pacific Islanders (7.3% vs 6.4%) and 123% higher among American Indians/Alaska Natives (14.3% vs 6.4%) relative to White women. For WSMW, the highest rate of chlamydia positivity occurred among Hispanics (12.7%), and the lowest among Asian/Pacific Islanders (5.4%). Finally, compared with WSM, the WSW and WSMW groups had higher rates of positivity among Whites, American Indians/Alaska Natives, and Hispanics.

The use of NAAT increased over time. In 1997, NAAT comprised 13.3%, 9.8%, and 11.2% of all tests among WSM, WSW, and WSMW, respectively. By 2005, NAAT comprised 59.1%, 69.4%, and 67.4% of testing among WSM, WSW, and WSMW, respectively. As expected, the rate of chlamydia positivity across the study period was higher as NAAT usage increased.

The majority of women presented for a “routine visit” (initial or annual gynecologic examination or comprehensive reproductive health assessment), with the minority reporting symptoms or exposure to a sexual partner with chlamydia as reason for visit. Symptoms included abnormal vaginal discharge, dysuria,

abdominal or pelvic pain, and abnormal vaginal bleeding. Few women (less than 5.0% in each group) reported exposure to a sexual partner with a positive test for chlamydia as their reason for attending clinic. Women in all groups who had symptoms as reason for visit at the time of testing were more likely to have a positive test for chlamydia, with the highest positivity among symptomatic WSW compared with symptomatic WSM or WSMW.

Separate analyses of each of the 3 groups were performed to assess differences in demographic, clinical, and behavioral risk profiles over the study period. The WSW group had higher rates of chlamydia positivity than did either WSM or WSMW among younger women (aged <20 years), American Indian/Alaska Native women, and when NAAT was used. Compared with WSM, WSW were more likely to test in the context of a nonroutine visit, to report symptoms, and to report a sexual partner with a positive test for chlamydia. Within each of these groups, chlamydia positivity rates were higher among WSW than among WSM or WSMW. Among women who had findings on clinical examination, WSMW had higher rates of chlamydia positivity than did either WSM or WSW. Compared with WSM, WSMW were more likely to be tested in the context of a nonroutine visit and to report symptoms and sexual behavioral risks.

Relative to WSM, chlamydia risk was comparable for WSW (odds ratio [OR]=1.38; 95% CI=1.25, 1.53) and WSMW (OR=1.37; 95% CI=1.20, 1.55) when we generated crude odds ratios. Moreover, in initial multivariate results with the total sample, associations between participant characteristics and risk of chlamydial infection were similar across the 3 sexual-partner groups. Relative to WSM, chlamydia risk was comparable for WSW (AOR=1.07; 95% CI=0.9, 1.2) and WSMW (AOR=1.03; 95% CI=0.9, 1.2) when we performed AOR analyses. We did find statistically significant interactions for 3 covariates with the sexual-partner measure: test type, history of chlamydial infection in past year, and exposure to chlamydia as reason for clinic visit. With these findings, we generated further multivariate results for each sexual-partner group separately. Table 2 displays risk factors independently associated with chlamydia positivity within each of the 3 groups of women.

Risk factors were comparable across all groups and included young age (<20 years), non-White race, use of NAAT, report of any sexual risk behavior in the past 60 days, clinical findings on examination, and report of a sexual partner with chlamydia. One exception was the association with *C trachomatis* infection in the past year, which was significantly associated with chlamydia positivity among WSM but not among WSW or WSMW. Although the 3 groups also varied in the degree to which report of chlamydia exposure as a reason for visit was associated with a positive chlamydia test, these findings were not substantively different. Seeking care for chlamydia testing because of known exposure was associated with increased likelihood of chlamydial infection (AORs ranging from 4.0 to 6.8), regardless of sexual-partner type.

DISCUSSION

In our analysis of women aged 15 to 24 years attending Region X IPP family planning clinics during 1997 through 2005, we found that women who reported same-sex sexual behavior had higher rates of positivity for *C trachomatis* than did women who reported exclusively heterosexual behavior. Factors associated with chlamydial infection among WSW included use of NAAT for diagnosis, testing at a nonroutine visit, report of symptoms, and report of a sexual partner with chlamydial infection. Over the study period, WSW who reported sexual behavioral risks also had the highest rate of chlamydia positivity compared with WSM or WSMW who reported those risks. Interestingly, a greater proportion of WSMW reported sexual risk behaviors compared with both WSM and WSW, yet WSMW did not have the highest positivity rate for *C trachomatis*. Of note, we found relatively high rates of chlamydia positivity among American Indian/Alaska Native women who reported sexual activity with women, a finding that is consistent with racial/ethnic disparities we have reported previously from the Region X IPP data.²⁰

Overall, our findings are consistent with previously published research noting that women who report same-sex sexual behavior, including those who report sexual activity only with women, often report a history of STI.^{21,22}

TABLE 1—Characteristics of Women Aged 15 to 24 Years in Family Planning Clinics and *Chlamydia trachomatis* (CT) Positivity Rates, by Sexual Partner Preference: Infertility Prevention Project, Region X (Alaska, Idaho, Oregon, and Washington), 1997–2005

Characteristic	Women Reporting Sexual Activity Only With Men (n = 595 258)		Women Reporting Sexual Activity Only With Women (n = 5714)		Women Reporting Sexual Activity With Men and Women (n = 3644)	
	No. (%)	CT Positivity, %	No. (%)	CT Positivity, %	No. (%)	CT Positivity, %
All women	595 258 (100.0)	5.3	5714 (100.0)	7.1	3644 (100.0)	7.1
Demographics						
Age groups, y						
15–17	128 615 (21.6)	6.0*	1076 (18.8)	7.9*	784 (21.5)	8.7*
18–19	156 598 (26.3)	6.0	1472 (25.8)	7.7	801 (22.0)	8.7
20–24	310 045 (52.1)	4.6	3166 (55.4)	6.6	2059 (56.5)	5.8
Race/ethnicity						
Non-Hispanic White	449 544 (76.4)	4.6*	4120 (73.1)	6.4*	2933 (81.6)	6.4*
Non-Hispanic Black	26 311 (4.5)	10.1	453 (8.0)	9.5	217 (6.0)	10.1
American Indian/Alaska Native	6966 (1.2)	9.5	70 (1.2)	14.3	62 (1.7)	11.3
Asian/Pacific Islander/Hawaiian	24 722 (4.2)	7.1	219 (3.9)	7.3	93 (2.6)	5.4
Hispanic	73 228 (12.3)	6.0	702 (12.5)	9.0	204 (5.7)	12.7
Multiracial/other	7319 (1.2)	7.2	71 (1.3)	2.8	84 (2.3)	6.0
Place of residence						
Urban	419 509 (78.2)	5.5*	3976 (82.1)	7.0	2716 (84.0)	7.1
Rural	116 944 (21.8)	4.6	868 (17.9)	6.3	517 (16.0)	7.0
Test type						
NAAT						
Yes	293 446 (50.3)	6.4*	2729 (48.2)	9.2*	2080 (57.4)	7.7*
No	297 383 (49.7)	4.1	2938 (51.8)	5.1	1544 (42.6)	6.2
Reason for visit						
Routine ^a						
Yes	458 456 (78.4)	4.5	3878 (69.5)	5.2	2513 (70.6)	6.5
No	126 618 (21.6)	8.1*	1703 (30.5)	11.5*	1044 (29.4)	8.4*
Symptoms ^b						
Yes	76 027 (13.0)	8.3*	933 (16.7)	11.3*	757 (21.3)	9.6*
No	509 047 (87.0)	4.8	4648 (83.3)	6.3	2800 (78.7)	6.4
Exposure to CT ^c						
Yes	7874 (1.3)	26.2*	278 (5.0)	34.5*	113 (3.2)	27.4*
No	577 200 (97.0)	5.0	5303 (95.0)	5.7	3444 (96.8)	6.4
Behavioral risks, past 2 months						
Any behavioral risk ^d						
Yes	147 399 (25.2)	8.5*	1910 (34.4)	11.0*	2062 (57.6)	9.0*
No	438 068 (74.8)	4.2	3647 (65.6)	5.0	1515 (42.4)	4.4
New sexual partner						
Yes	131 933 (22.6)	7.9*	1480 (26.9)	9.6*	1769 (50.0)	9.0*
No	451 366 (77.4)	4.5	4018 (73.1)	6.2	1769 (50.0)	5.1
>1 sexual partner						
Yes	55 502 (9.5)	9.7*	826 (15.1)	10.2*	1370 (39.0)	9.1*
No	526 465 (90.5)	4.8	4628 (84.9)	6.6	2144 (61.0)	5.8
Symptomatic sexual partner						
Yes	13 517 (2.5)	19.6*	353 (6.9)	21.2*	251 (8.2)	17.1*
No	532 390 (97.5)	4.7	4776 (93.1)	5.7	2806 (91.8)	6.1

Continued

TABLE 1—Continued

Clinical findings ^e						
CT, past year						
Yes	23 339 (4.0)	12.2*	308 (5.9)	10.7*	209 (6.0)	12.0*
No	554 586 (96.0)	5.0	4932 (94.1)	6.9	3268 (94.0)	6.8
1 or more						
Yes	36 782 (6.2)	13.9*	328 (5.7)	14.3*	285 (7.8)	16.5*
No	459 577 (77.2)	4.5	3890 (68.1)	5.6	2562 (70.3)	6.1
Data not available ^f	98 899 (16.6)	6.5	1496 (26.2)	11.0	797 (21.9)	6.5

Note. NAAT = nucleic acid amplification testing.
^aIncludes initial or annual gynecological examination and comprehensive reproductive health assessment.
^bIncludes abnormal vaginal discharge, dysuria, abdominal or pelvic pain, and abnormal vaginal bleeding.
^cExposure to sexual partner diagnosed with CT.
^dIncludes having a new sexual partner, multiple sexual partners, and symptomatic sexual partner, past 60 days.
^eIncludes cervical ectopy, friable cervix, pelvic inflammatory disease, and cervicitis.
^fNo clinical examination or missing data.
 **P* < .05.

Sexual behaviors that these women engage in, including receptive vaginal and anal sexual activity with fingers, hands, and shared sex toys, present a plausible means for exchange of infected cervicovaginal secretions, as supported by reports of genital HPV, trichomoniasis, and HIV among women who reported sexual activity exclusively with women.^{7–14}

Previous analyses of clinic-based data from the United States, United Kingdom, and Australia have reported detection of chlamydial infection among WSW and WSMW. In one study of 708 new patients attending a sexual health clinic for lesbians in London, fewer WSW than WSMW underwent endocervical culture for *C trachomatis*, but infections were diagnosed in 2 women reporting sexual activity exclusively with women.²¹ However, our finding of higher rates of chlamydia positivity among women reporting sexual activity with women, relative to women reporting sexual activity exclusively with men, was unexpected. Possible explanations for this observation relate to differences in these 2 groups' use of reproductive health care services (including chlamydia screening), biological susceptibility to lower genital tract infection, infrequent use of barrier methods to prevent STI transmission with female partners, trends toward higher risk behaviors, and differential characteristics of their respective sexual networks.

With regard to access to and use of reproductive health services, several investigators have reported that WSW are less likely to

undergo routine Papanicolaou test screening—and generally, preventive gynecologic care, often sought in the context of obtaining birth control—relative to their exclusively heterosexual counterparts.^{23,24} This would logically reduce the number of health care encounters at which chlamydia testing would likely be performed. Moreover, most women who report

same-sex sexual behavior do not believe that they are at risk for acquiring STIs from their female partners.²⁵ This may lead to less frequent use of some preventive measures (for example, washing sex toys between partners) or infrequent use of barrier methods (including gloves, condoms, and dental dams) for STI prevention.²⁶ Further, health care providers do not always

TABLE 2—Multivariate Risks for *Chlamydia trachomatis* Infection Among Women Aged 15 to 24 Years in Family Planning Clinics, by Sexual Partner Preference: Infertility Prevention Project, Region X (Alaska, Idaho, Oregon, and Washington), 1997–2005

	WSM, OR (95% CI)	WSW, OR (95% CI)	WSMW, OR (95% CI)
Age < 20 y	1.3* (1.2, 1.3)	1.4* (1.1, 1.8)	1.7* (1.2, 2.2)
Non-White race	1.5* (1.5, 1.6)	1.3 (1.0, 1.7)	1.7* (1.2, 2.3)
Rural	0.9* (0.8, 0.9)	1.1 (0.8, 1.6)	0.9 (0.6, 1.4)
Positive <i>C trachomatis</i> test, past 12 months	1.7* (1.7, 1.8)	1.0 (0.6, 1.5)	1.1 (0.6, 1.9)
NAAT used for diagnosis	1.4* (1.3, 1.4)	1.9* (1.5, 2.6)	1.1 (0.8, 1.5)
Sexual behavioral risk ^a	1.9* (1.8, 2.0)	1.8* (1.4, 2.3)	2.0* (1.4, 2.8)
Clinical findings ^b			
No (Ref)	1.0	1.0	1.0
Yes	3.1* (3.0, 3.2)	3.5* (2.3, 5.3)	2.5* (1.7, 3.8)
Data not available ^c	1.3 (1.2, 1.3)	1.7 (1.3, 2.3)	0.9 (0.6, 1.3)
Exposure to <i>C trachomatis</i> ^d	4.0* (3.8, 4.3)	6.8* (4.9, 9.6)	5.0* (3.0, 8.3)

Notes. CI = confidence interval; NAAT = nucleic acid amplification testing; OR = odds ratio; WSM = women reporting sexual activity only with men; WSMW = women reporting sexual activity with both men and women; WSW = women reporting sexual activity only with women.
^aHaving a new sexual partner, multiple sexual partners, or symptomatic sexual partner, past 60 days.
^bCervical ectopy, friable cervix, pelvic inflammatory disease, or cervicitis.
^cNo clinical examination or missing data.
^dExposure to sexual partner diagnosed with *C trachomatis*.
 **P* < .05.

obtain a complete sexual history and may thus fail to elicit reports from WSW of higher-risk behaviors that would prompt *C trachomatis* screening and related prevention counseling.²⁷

Another potential explanation for our finding of relatively high rates of chlamydia positivity among WSW relates to selection of sexual partners. Some women who report same-sex sexual behavior may be more likely to select higher-risk sexual partners and participate in higher-risk behaviors, including unprotected vaginal and anal intercourse with homosexual or bisexual men.^{6,28} One large cross-sectional survey across health care sites in the United States found that women who identified as lesbians reported more male sexual partners and higher numbers of male sexual partners who reported sexual activity with other men in the past year than did either heterosexual or bisexual women.²⁹ In a Seattle-based study of women reporting sexual activity with at least 1 woman in the past year, concurrency (overlap between sexual partnerships reported by participant) was common, especially among bisexual women.³⁰ Moreover, bisexual women frequently reported inconsistent condom use during either vaginal or anal intercourse with men. Many of these women (16%) believed that their male partner had engaged in sexual intercourse with another man at some point in time. Additional studies have demonstrated other high-risk behaviors among some women reporting sexual activity with women, including use of injection drugs and crack cocaine and exchange of sexual intercourse for drugs or money.^{6,31–34}

Finally, bacterial vaginosis, a condition that occurs when the hydrogen peroxide-producing *Lactobacillus* species that characterize the normal human vagina are replaced by high quantities of commensal anaerobic bacteria, increases the risk of STI acquisition, including *C trachomatis*.^{35–37} For reasons that are unclear, bacterial vaginosis is highly prevalent among WSW^{14,32,38–41} and could theoretically place women reporting same-sex sexual behavior at increased risk for chlamydia if sexual exposure to *C trachomatis* occurs.

There are limitations to our analysis. First, we could not perform a detailed analysis of the timing or type of specific sexual behaviors because this information was not elicited in the standardized patient forms. Programs such as the IPP rely on a limited number of measures to

capture risk behavior and do not include expanded or detailed measures that include information on substance abuse, sexual practices, information on sexual partners and related sexual networks, and exposures to other STIs.^{42,43} Second, evaluation of risk factors in association with chlamydial infections poses challenges because the pathogen can persist for months to years in women.^{44,45} In the IPP, women were asked about specific sexual behaviors in the 2 months prior to chlamydia testing and about sex of sexual partners in the past year; thus, our ability to infer a direct association between recent sexual practices and detection of chlamydial infection is limited. Finally, misclassification of women into groups defined by same-sex sexual behavior may occur if the accuracy of self-disclosure of sexual behavior is affected by the manner in which this information is solicited. Although all women in this study were interviewed by health care providers, the precise method for how these questions were asked was not specified or monitored across clinic sites and providers. Thus, variation in how this potentially sensitive topic was approached could have affected the likelihood of accurate self-reporting. Nonetheless, we do not believe that systematic misclassification of this characteristic across all sites and over the study period is likely to have occurred, and, thus, we believe that this is an unlikely explanation for our findings. If anything, same-sex sexual behavior is more likely to be underreported to care providers.⁴⁶ Whether women in our study population who reported same-sex sexual behavior differed from those who experienced it but did not report it is not known.

In summary, our data indicate that women who report sexual activity with women are at risk for genital chlamydial infection and should benefit from screening and surveillance programs aimed at this common infection. Further investigation focusing on the frequency and types of sexual risk behaviors, provision of appropriate STI diagnostic testing and prevention counseling, labeling of sexual identity, and sexual networks in this group is needed. ■

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Contributors

D. Singh and J.M. Marrazzo originated the study design, identified key results, and facilitated the interpretation of the findings into the writing of the article. D.N. Fine oversaw the data collection, collaborated on the analysis, and provided content review for the results and interpretation of key findings.

Human Participant Protection

No protocol approval was needed for this study.

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