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Primary and secondary syphilis among men who have sex with men and women, 2010–2019

Emily R. Learner, PhD[1], **Jeremy A. Grey, PhD**[1], **Kyle Bernstein, PhD**[1], **Robert D. Kirkcaldy, MD**[1], **Elizabeth A. Torrone, PhD**[1]

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

Abstract

The relative proportion of cases of P&S syphilis among men who have sex with men and women reported through national case report data from 2010 through 2019 appeared stable overall and stratified by race/ethnicity, region, and age group, but case counts increased.

Summary:

Counts of P&S syphilis cases among men who have sex with men and women from 2010–2019 increased but the relative proportion of cases appeared stable.

Keywords

Syphilis; Men who have sex with men and women

Introduction:

Reported cases and case rates of primary and secondary (P&S) syphilis, the most infectious stages of syphilis, have increased in the United States since 2000, with 38,992 cases of P&S syphilis reported in 2019 (1). Case rates have increased among both men and women, and among all race/ethnicities and in all regions of the US. Increases in case counts among men overall have been driven by increases in cases among gay, bisexual, and other men who have sex with men (MSM), who have historically accounted for a large proportion of P&S syphilis cases. However, the proportion of P&S syphilis cases among MSM has declined in recent years, while the proportion of P&S cases among women and men who have sex with women only has increased, suggesting two divergent syphilis epidemics in the US.

Men who have sex with both men and women (MSMW) have been hypothesized to play an important role in STD epidemics, including syphilis, because they may serve as an

Corresponding Author: Emily Learner, PhD, kvd7@cdc.gov, Centers for Disease Control and Prevention, 1600 Clifton Road NE, Atlanta, GA 30329.

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epidemiologic link that enables STDs to cross between heterosexual and MSM sexual networks (2–4). The relative contribution of P&S syphilis cases among MSMW is important to understand to help evaluate their possible role in linking sexual networks. However, trends among MSMW (distinct from men who have sex only with men [MSMO]]) are not typically examined. In this report, we explored the number and relative proportion of cases of P&S syphilis among MSMW over time to better understand the potential role that MSMW may play in the ongoing syphilis epidemic. These data represent the first comprehensive look at the temporal epidemiology of syphilis among MSMW using national case report data.

Methods:

P&S syphilis case notification data from all 50 states and the District of Columbia from 2010 through 2019 were extracted from the National Notifiable Diseases Surveillance System (NNDSS). Case notification data provided to CDC through NNDSS include select demographic, clinical and behavioral variables, including information on number and sex of recent sex partners. Information about sex partners was collected by case interview or investigation by the local health department. Men with syphilis were categorized as MSMO if they reported having only male partners in the past 12 months. Men who reported having sex only with female partners in the past 12 months were categorized as men who have sex only with women (MSWO). Men who reported both male and female partners in the past 12 months were categorized as MSMW. Men who did not report the sex of sex partners, including men not able to be interviewed, were categorized as unknown. Women were included in the analysis regardless of reported sex of sex partners. Cases from states that reported sex of sex partners data for ≥70% of male P&S syphilis cases for all years were included in this analysis to minimize bias from missing data. Cases with unknown sex were excluded.

We examined the frequency and proportion of P&S syphilis cases by sex and sex of sex partners from 2010 through 2019, and stratified trends by race/Hispanic ethnicity, U.S. census region, and age group to examine differences in trends within subgroups. Ninety-five percent confidence intervals (CIs) are reported to provide an estimate of precision around estimates. IRB approval was not needed for this analysis because it involved analysis of surveillance data.

Results:

During 2010–2019, 162,588 P&S syphilis cases were reported from 27 states with sex of sex partners data available for ≥70% of male P&S syphilis cases, representing 68.6% of all P&S syphilis cases reported by all 50 states and the District of Columbia over the same period. The few cases with missing sex were excluded from analyses (n=181, 0.1%). The final analytic sample included 162,407 P&S syphilis cases. Half of cases were among MSMO (n=84,150, 51.8%), and 15.8% (n=25,604) were among MSWO. Almost 6% were among MSMW (n=9,198). Sex of sex partners data were unknown for 13.5% of men (n=21,917). Women comprised 13.3% of cases (n=21,538). The total number of reported annual cases increased over time (9,480 in 2010 to 26,538 in 2019).

Among MSMW, the absolute number of reported cases increased over time but the relative proportion of cases appeared stable. Cases counts among MSMW increased monotonically from 521 in 2010 to 1485 in 2019 (Figure 1A, Table S1). The relative proportion of cases among MSMW hovered between 5.5% and 6.1% for all years, with 5.5% (95% CI: 5.0% - 6.0%) of cases occurring in MSMW in 2010 and 5.6% (95% CI: 5.3% - 5.9%) occurring among MSMW in 2019 (Figure 1B). Trends in the relative proportion of cases among MSMW appeared stable when stratified by race/ethnicity, region, and age group (Tables S2–S4).

Case counts and the proportion of cases among MSMO, MSWO, and women are shown in Figures 1A and 1B for comparison. As previously documented (1) the relative proportion of cases among MSMO decreased over the study period, while the relative proportion of cases among women and MSWO increased.

Discussion:

Understanding the relative contribution of MSMW to total P&S syphilis over time can help inform the potential role that MSMW may place in the current syphilis epidemic in the US. We observed that while the number of MSMW syphilis cases increased, trends in proportion of P&S syphilis cases among MSMW during 2010–2019 were stable overall and by race/ethnicity, region, and age, in contrast to increases among heterosexual populations and increases then leveling among MSMO.

Although the growing number of MSMW cases could indicate that epidemiologic links between sexual networks are increasing in frequency, syphilis transmission dynamics are important to consider. MSMW may serve as an important link between networks for HIV sexual transmission (5), which can occur with a sexual act involving contact with semen or vaginal fluid from a non-virally suppressed person. However, unlike HIV transmission, sexual transmission of syphilis typically only occurs via contact with a painless, mucocutaneous anogenital or oral lesion. These lesions are usually present soon after infection and self-resolve in a short time period (e.g., 2 weeks). Persons with a noticeable lesion may delay sexual contact, which may help limit transmission between sexual partners. For a MSMW to serve as an epidemiologic link from an MSM to a heterosexual network, they would likely have a female partner soon after infection from a male partner and have an unnoticed or ignored lesion on their penis or in their mouth (to be able to transmit during penile-vaginal, penile-oral sex, or oral-vaginal sex). Timing and type of sexual contact with male and female partners are important factors to take into account in future research examining whether MSMW are influential epidemiologic links between heterosexual and MSM networks for syphilis.

The rise in P&S syphilis case counts among MSMW should serve as a reminder that MSMW have unique reproductive and sexual health care needs. Clinical care provided to MSMW should include STD and HIV risk reduction messaging (including referrals for HIV PrEP when applicable) for both male and female partners, as well as pregnancy prevention and contraceptive services (6–8). In addition, to prevent stigma, sexual history should be taken in a way that is non-judgmental and respectful of both behavior and identity (9).

Furthermore, taking a sexual history at each visit is critical, as sexual behavior is fluid and dynamic and activities reported in the past may not reflect more recent exposures (10). Partner services should employ similar strategies to address unique needs of MSMW.

Sex of sex partners was unknown for about 1 in 7 men, likely a result of information not being disclosed or elicited during an interview or investigation, or lack of contacting information for the patient. In this analysis, men with unknown sex of sex partners were classified into their own category, but some of these men may have had both male and female sex partners. Thus, the number of MSMW cases in this analysis are likely underestimates. Sex of sex partners is also based on a recall period of 12 months, which may exceed the timeframe during which syphilis was acquired, and some misclassification of sex of sex partners may be present. Further, although case data are reliable estimates of the burden of diagnosed and reported infections, infections may be undiagnosed (11), and case counts are likely an underestimate of true disease burden. Additionally, we included data only from states with ≥70% complete reporting of sex of sex partners for males to minimize bias from variation in missing data over time. The states included represent nearly 70% of all reported syphilis, and sensitivity analyses comparing trends using data from all states to trends using data from only states with ≥70% complete reporting generated similar results, but some bias may still be present and results may not be representative of the entire US. Few estimates of the number of MSMW in the US exist (12), and the lack of population-level denominators limits our ability to generate P&S syphilis case rates among MSMW. Lastly, the data presented here do not include sexual network level information, and inferences about transmission between networks should be interpreted with caution.

The number of P&S syphilis case counts among MSMW in the US increased during 2010–2019 emphasizing the need for risk reductions strategies that address unique needs of MSMW. To better understand the potential role MSMW play in the current syphilis epidemic, research is needed that directly investigates the frequency of epidemiologic links between syphilis sexual networks, including measuring timing and type of sexual activity.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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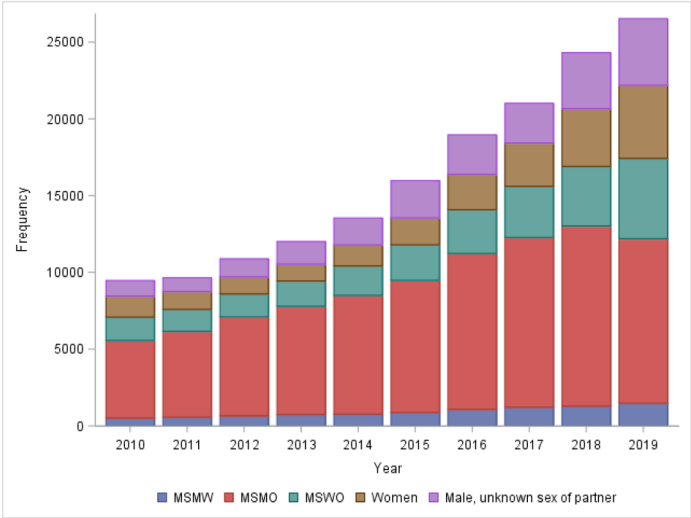
A)



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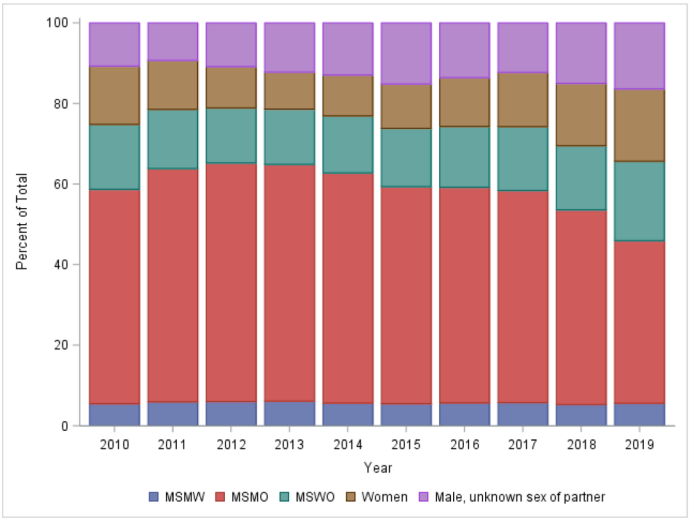

Figure 1:

Frequency (A) and proportion (B) of P&S syphilis cases by sex and sex of sex partners, 27* states, 2010−2019

MSMO: men who have sex only with men; MSMW: men who have sex with men and women; MSW: men who have sex with only with women

*Cases reported from 27 states with sex of sex partners data available for ≥70% of male P&S syphilis cases