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Assessing alignment of sexual orientation and sex of sex partners among men with primary and secondary syphilis, 2022

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Abstract

We examined alignment between sex of sex partners and sexual orientation (SO) in syphilis case notifications among men during 2022 to inform interpretation of SO data for notifiable conditions in the National Notifiable Diseases Surveillance System. Observed partial alignment underscores the importance of analyzing appropriate variable(s) for a given intervention.

SUMMARY

Among case notifications for men with primary & secondary (P&S) syphilis during 2022, sexual behavior and sexual orientation data were only partially aligned.

Keywords

SOGI; National Notifiable Diseases Surveillance System; surveillance; syphilis

INTRODUCTION

People within sexual minority populations are disproportionately impacted by sexually transmitted infections (STIs) in the United States¹, which makes collecting sexual orientation (SO) data crucial for addressing health disparities faced by these populations^{2,3}. SO is a multidimensional construct, which encompasses aspects of a person's attractions, behaviors, and sense of self⁴. Sexual behavior, described in part by sex of sex partners (SOSP), is a particularly important factor to consider when evaluating STI transmission dynamics, given that STI burden often varies by SOSP. For example, during 2013–2022, the largest percentage of primary and secondary (P&S) syphilis cases were among men who had sex with men only (MSM, 42%, 147,181), as compared to men who had sex with partners of unknown sex (MSU, 18%, 61,829), men who had sex with women only (MSW, 18%, 61,432), women (17%, 58,715), and men who had sex with men and women (MSMW, 5%, 18,461)¹.

When data are available for SO but not SOSP in surveillance-based epidemiological analyses, SO might be used as a proxy to infer behavioral information about SOSP (e.g.,

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assumptions that straight men have sex with women only, that gay men have sex with men only, or that bisexual men have sex with both men and women). However, for several reasons^{2,3,5,6}, SO may not accurately predict SOSP, which could invalidate epidemiologic findings based on such assumptions. Currently, data on SO and SOSP are collected for syphilis case notifications sent to the Centers for Disease Control and Prevention (CDC) via the National Notifiable Diseases Surveillance System (NNDSS)¹. Data for SO and SOSP are absent for most other notifiable conditions in NNDSS; however, in alignment with best practices for the collection of sexual orientation in other federal data sources, SO may become an optional data element for other notifiable conditions in the future⁷. In the event SO is added as a data element to NNDSS in the future, guidance is needed regarding how to interpret these data in the context of various diseases, including those that are not transmitted sexually.

To inform interpretation of SO data for STIs and other NNDSS-notifiable conditions, we examined alignment between SO and SOSPs among P&S syphilis case notifications sent to CDC via NNDSS. It is commonly recognized in the STI field that SO and sexual behavior are not interchangeable concepts, meaning that nonperfect alignment of SO and SOSP is both appropriate and expected. However, because case notifications for non-STI conditions may soon include data about SO without accompanying SOSP data, we see this analysis as a way for our field to share a lesson forward.

METHODS

Data on SO and SOSP among men aged ≥ 15 years with P&S syphilis were obtained from case notifications sent to CDC from 51 jurisdictions (50 states and the District of Columbia) via NNDSS during 2022. To minimize bias from incomplete reporting, we restricted our sample to cases from jurisdictions that sent complete data, defined here as both SO and SOSP data for $\geq 70\%$ of cases. We calculated percent agreement between reported SOSPs (MSW, MSM, MSMW, and MSU) in the past 12 months and SO (straight, gay, bisexual, missing/unknown) reported at the time of data collection. Notably, SO did not have a specified time frame.

This study used data routinely collected as a part of public health surveillance and was not subject to institutional review board approval for human subjects' protection. Analyses were performed in Stata version 16.1.

RESULTS

Overall, 11 jurisdictions sent complete data for SO and SOSPs to CDC via NNDSS during 2022 for P&S syphilis cases reported among males over 15 years of age. Altogether, these cases ($n=7,197$) represented approximately 16% of all male P&S syphilis cases over 15 years of age ($N=44,287$) reported to the CDC via NNDSS during 2022 (i.e., across all 51 jurisdictions). Over 60% of cases in our analytical sample were between the ages of 25–44 years, with 36% of all cases being non-Hispanic Black or African American, 35% being non-Hispanic White, and 20% being Hispanic. Most cases were reported as either straight (44%) or gay (36%), and most cases were reported as either MSW (39%) or MSM (36%).

Among the 11 jurisdictions with complete data, SO aligned with recent SOSP for 81% of cases, with a range of 70%–93% alignment across jurisdictions. Among men reported as straight (n=3,151), 5% were reported as having recent male partners, and among men reported as gay (n=2,602), 3% were reported as having recent female partners (Figure 1). Among men reported as bisexual (n=548), 7% reported recent female partners only and 23% reported recent male partners only (Figure 1). Among men reported with an unknown SO (n=896), 29% had information on SOSPs; 9% were reported with recent male partners only, 17% with only female partners, and 3% with both male and female partners recently (Figure 1).

DISCUSSION

Among 11 jurisdictions with complete reporting on SO and SOSP for men with P&S syphilis, we found 81% agreement between these variables. Thus, alignment between reported orientation and behavior within the past 12 months was high but, as expected, not perfect. Areas of non-agreement between SO and SOSP could be due to various factors, including: fluidity in recent sexual encounters, social desirability and fear of stigma, or variation in how jurisdictions collect SO and SOSP data. Caution is warranted in interpreting reported SO data for NNDSS conditions when SOSP data are absent, as SO may not accurately reflect recent behaviors. For example, while the SO parameter can provide important information about health disparities of those affected by a given condition, it may be a flawed proxy for informing epidemiological models about recent sexual behaviors and transmission pathways in social and sexual networks.

An important limitation to note is the use of the SO and SOSP categories currently approved for data collection through NNDSS for syphilis cases. These categories do not fully capture the range of orientation or experiences⁸, nor are they consistent with best practice recommendations^{4,9}.

Of the 51 jurisdictions that sent NNDSS data to CDC, our analysis was limited to 11 jurisdictions with complete reporting of SO and SOSP data. While these jurisdictions represent diverse regions and demographics, caution is warranted in generalizing these findings to all 51 jurisdictions. Multiple factors affect accurate and complete reporting of SO and SOSP variables across jurisdictions¹⁰, including inter-jurisdictional differences in: ascertainment methodology, data quality control activities, and information systems-related challenges (e.g., a jurisdiction's ability to process and transmit these data elements to CDC). A better understanding of reporting barriers for these variables is needed to improve data collection for interventions aimed at reducing health disparities for sexual minority populations.

SO and SOSP data each provide unique information about orientation and behavior, respectively, and do not serve as proxies for each other. When analyzing SO data for NNDSS conditions, thoughtful consideration is needed to ensure data interpretations are appropriate when SOSP data are lacking.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Disclaimer:

The findings and conclusions in this paper are those of the authors and do not necessarily represent the views of the Centers for Disease Control and Prevention.

REFERENCES

1. Centers for Disease Control and Prevention. Sexually Transmitted Infections (STI) Surveillance, 2023. Atlanta, GA 2024.
2. Wolff M, Wells B, Ventura-DiPersia C, Renson A, Grov C. Measuring sexual orientation: A review and critique of US data collection efforts and implications for health policy. *The Journal of Sex Research*. 2017;54(4-5):507–531. [PubMed: 28010119]
3. Lynch KE, Viernes B, Schliep KC, et al. Variation in sexual orientation documentation in a national electronic health record system. *LGBT Health*. 2021;8(3):201–208. [PubMed: 33625876]
4. National Academies of Sciences Engineering Medicine. Measuring sex, gender identity, and sexual orientation. Washington, DC: The National Academies Press; 2022.
5. McCormack M. Issues in Bisexual men's lives: Identity, health and relationships. *Current opinion in psychology*. 2023;49:101501. [PubMed: 36473377]
6. Lever J, Kanouse DE, Rogers WH, Carson S, Hertz R. Behavior patterns and sexual identity of bisexual males. *The Journal of Sex Research*. 1992;29(2):141–167.
7. Office of the Chief Statistician of the United States. Recommendations on the best practices for the collection of sexual orientation and gender identity data on federal statistical surveys. 2023.
8. Tamí-Maury I, Millett TJ. Recommendations and Implementation Considerations for the Routine Collection of Sexual Orientation and Gender Identity Data in Research and Practice. *American Journal of Public Health*. 2024;114(8):777–781. [PubMed: 38959466]
9. Kahn NF, Halpern CT, Burshell DR, Hernandez SM, Conron KJ. Assessment of Health Disparities and Sexual Orientation Response Choices Used in Two US National Population-Based Health Surveys, 2020–2021. *American Journal of Public Health*. 2024;114(12):1375–1383. [PubMed: 39504554]
10. Centers for Disease Control and Prevention. Technical Notes from STI Surveillance, 2023. 2024; <https://www.cdc.gov/sti-statistics/annual/technical-notes.html>.

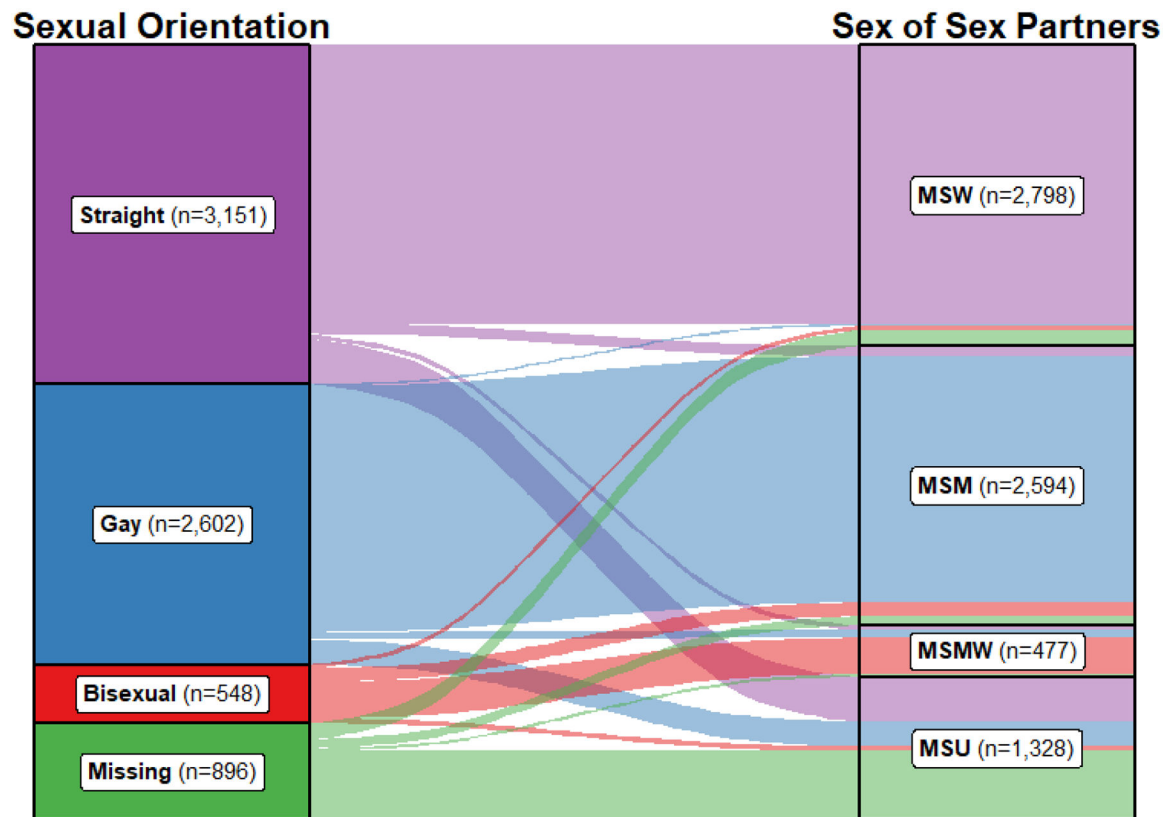


Figure 1. Alluvial plot visualizing alignment between sexual orientation (SO, left column) and sex of sex partners (SOSP, right column) among men with P&S syphilis (n=7,197). Colors correspond to SO (purple: straight, blue: gay, red: bisexual, and green: missing/unknown), with the proportion of SOs contributing to each SOSP category shown on the right.