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# Self-reported syphilis and gonorrhoea testing among men who have sex with men: national HIV behavioural surveillance system, 2003–5

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## ABSTRACT

**Objectives:** The Centers for Disease Control and Prevention provides guidance on sexually transmitted disease (STD) testing specifically for men who have sex with men (MSM) in STD treatment guidelines to address increasing rates of gonorrhoea and syphilis among MSM in the USA. The guidelines recommend at least annual syphilis, gonorrhoea and chlamydia testing for sexually active MSM. The implementation of these guidelines was evaluated.

**Methods:** Data from the 2003–5 MSM cycle of the National HIV Behavioural Surveillance System were used. The proportion of sexually active HIV-negative MSM reporting syphilis and gonorrhoea testing during the previous year was determined and multivariate logistic regression was used to identify factors associated with testing.

**Results:** Of 10 030 MSM, 39% and 36% reported having been tested for syphilis and gonorrhoea in the previous year, respectively. Four factors were associated with syphilis and gonorrhoea testing, respectively: age 18–24 years versus  $\geq 45$  years (odds ratio (OR) 2.2, 95% CI 1.8 to 2.5; OR 2.7, 95% CI 2.3 to 3.2), black versus white race (OR 1.3, 95% CI 1.1 to 1.4; OR 1.4, 95% CI 1.2 to 1.6), private insurance versus no insurance (OR 1.3, 95% CI 1.1 to 1.4; OR 1.3, 95% CI 1.1 to 1.4) and disclosing male–male sex to a healthcare provider (OR 2.2, 95% CI 2.0 to 2.5; OR 2.1, 95% CI 1.9 to 2.3).

**Conclusions:** Syphilis and gonorrhoea testing among MSM was low, despite specific testing recommendations in the STD treatment guidelines. To increase STD testing among MSM, healthcare providers should assess the risks of STD for male patients through routine enquiries about sexual activity.

Sexually transmitted disease (STD) transmission among men who have sex with men (MSM) continues to be an important public health problem in the USA. Rates of infectious syphilis and gonorrhoea have increased among MSM in the USA during the past 10 years.<sup>1–5</sup> Because STD can facilitate HIV transmission,<sup>6</sup> an increase in STD among MSM may be associated with an increase in HIV incidence.<sup>7</sup> As a result of concern over increases in some STD among MSM, especially infectious syphilis and gonorrhoea, the Centers for Disease Control and Prevention (CDC) suggests routine STD screening for sexually active MSM.<sup>8</sup> This guidance is intended to assist healthcare providers in preventing, diagnosing and treating STD among MSM. The 2006 STD treatment guidelines recommend annual serological testing for syphilis and HIV infection, and chlamydia and

gonorrhoea tests at anatomical sites of exposure, as most STD are asymptomatic, especially in non-genital sites. More frequent testing (eg, at 3–6-month intervals) is recommended for MSM who have multiple or anonymous sex partners, have sex in conjunction with illicit drug use, use methamphetamines, or have sex partners who participate in these activities.<sup>9</sup>

Evaluation of the STD treatment guidelines is important to determine their impact on healthcare practice. Many surveillance and research studies evaluating STD testing among MSM have used data from STD clinics, reflecting diagnostic testing performed on individuals seeking evaluation or treatment for STD. Because STD clinic data do not provide information on MSM accessing healthcare at other venues, these data may not be representative of STD testing among MSM. Data on the prevalence of STD screening among MSM from sources other than STD clinics are limited. The National HIV Behavioural Surveillance System (NHBS) collects information on HIV-related risk behaviours and testing for STD among populations at high risk of HIV infection, including MSM.<sup>9</sup> NHBS is a community-based survey and may provide a more representative sample from which to assess STD screening among MSM compared with STD clinic data. We conducted an analysis of data collected through NHBS from 2003 to 2005 to: (1) evaluate the implementation of the CDC STD treatment guidelines; (2) estimate the prevalence of STD testing among MSM and (3) determine the factors associated with testing.

As a result of the time period of the survey, the 2002 CDC STD treatment guidelines were used for this analysis. Similar to the 2006 treatment guidelines, the 2002 treatment guidelines recommended annual testing for syphilis, gonorrhoea, chlamydia and HIV for sexually active MSM.

## METHODS

The overall strategy for NHBS is to conduct rotating cycles of surveillance in three populations at high risk of HIV infection: MSM (NHBS–MSM), injection drug users and heterosexual adults in high-prevalence areas. State and local health departments eligible to participate in NHBS were those whose jurisdictions included metropolitan statistical areas (MSA) with the highest estimated prevalence of individuals living with AIDS in 2000. Data used for this analysis were collected in 15 MSA during the first round of NHBS–MSM, November 2003–April 2005: Atlanta, Georgia; Baltimore, Maryland; Boston, Massachusetts;

**Table 1** Selected characteristics by testing for syphilis and gonorrhoea in the past 12 months among 10 030 sexually active MSM, National HIV Behavioural Surveillance System—MSM, 2003–5

Characteristic	Total	Syphilis testing	Gonorrhoea testing
	n = 10 030* no (%)	n = 3938* no (%)	n = 3629* no (%)
Age group, years			
18–24	2186 (22)	977 (25)	944 (26)
25–34	3493 (35)	1507 (38)	1409 (39)
35–44	2937 (29)	1043 (26)	929 (26)
≥45	1414 (14)	411 (10)	347 (10)
Race/ethnicity†			
White	4510 (45)	1655 (42)	1513 (42)
Hispanic	2680 (27)	1140 (29)	1003 (28)
Black	1739 (17)	715 (18)	689 (19)
Other	993 (10)	393 (10)	394 (11)
Highest level of education			
Less than high school	549 (5)	206 (5)	189 (5)
High school	1700 (17)	647 (16)	630 (17)
More than high school	7775 (78)	3083 (78)	2808 (77)
Type of health insurance			
Private	6634 (66)	2703 (69)	2477 (68)
Public	427 (4)	160 (4)	149 (4)
None	2473 (25)	875 (22)	805 (22)
Exposure to prevention services			
Yes	1891 (19)	927 (24)	865 (24)
No	8133 (81)	3010 (76)	2762 (76)
Disclosure of sex with men to healthcare provider			
Yes	6646 (66)	2692 (68)	2705 (75)
No	3163 (32)	878 (22)	830 (23)
Risk category			
High	7162 (71)	3023 (77)	2793 (77)
General	2868 (29)	915 (23)	836 (23)

\*Numbers might not add up to total because of missing data. †Categories are mutually exclusive. MSM, men who have sex with men.

Chicago, Illinois; Denver, Colorado; Fort Lauderdale, Florida; Houston, Texas; Los Angeles, California; Miami, Florida; Newark, New Jersey; New York City, New York; Philadelphia, Pennsylvania; San Diego, California; San Francisco, California; and San Juan, Puerto Rico. A minimum of 500 eligible individuals from each MSA were interviewed. Eligibility criteria included: age ≥18 years; having been male at birth; being a current resident of a participating MSA; not having previously participated in NHBS–MSM and being able to provide informed consent. For our analysis, we included only men who reported having a male sex partner in the past 12 months. We excluded HIV-positive individuals because they are more likely than those who are not known to be infected with HIV to be in the care of a healthcare provider who should be following HIV treatment guidelines that address STD testing.<sup>10</sup>

Details about the NHBS–MSM sampling and data collection method have been reported previously.<sup>11 12</sup> The main steps are as follows: venues frequented by MSM were identified; optimal days of the week and times of day for sampling at each venue were determined and then sampling events were chosen using random selection methods. Venues included bars, clubs, restaurants, health clubs, social organisations, bookstores, bathhouses, street locations, parks and special events. Men were systematically recruited at venues during sampling events. Trained interviewers used a standardised questionnaire to collect information about behavioural risks and HIV/STD testing history. CDC determined that NHBS–MSM was public

health surveillance and not a research activity. Human subjects protection review was conducted locally according to policies of the institutions conducting NHBS–MSM.

Dependent variables for this analysis were self-reported testing for syphilis and gonorrhoea during the 12 months preceding the interview. Men were asked the question: “In the past 12 months, have you been tested for syphilis, gonorrhoea, or some other STD?” Men could choose any answer that applied. NHBS did not collect information on anatomical site of testing. Independent variables included demographics, health insurance, education, MSA, disclosure of sexual activity with a man to a healthcare provider, risk category and exposure to HIV/STD prevention services that have been shown to reduce sexually transmitted infections.<sup>13 14</sup> In the 2002 CDC STD treatment guidelines, MSM at high risk of STD infection included three categories: individuals who had multiple anonymous partners; individuals who had sex in conjunction with illicit drug use and individuals whose sex partners participated in these activities.<sup>15</sup> Using NHBS, we were not able to replicate these criteria exactly. We used multiple casual partners as a proxy instead of anonymous partners because information about anonymity of partners was not specifically collected. We defined multiple casual partners as more than one sexual partner in the past 12 months. We were able to measure drug use during sex in the past 12 months, but we did not include information about participant’s sex partners because this information was not specifically collected. Therefore, we defined MSM at high risk of acquiring an STD

to be those who either acknowledged having multiple casual partners or used illicit drugs during sex with one or more partners in the past 12 months. We defined MSM at general risk of acquiring an STD to be individuals who did not acknowledge either having multiple casual partners or using illicit drugs during sex with one or more partners in the past 12 months.

Bivariate analyses were performed to examine crude associations between STD testing and the independent variables. Independent variables associated with STD testing ( $p < 0.10$ ) were considered for inclusion in multivariate analyses. We used multivariate logistic regression to determine which factors were independently associated with obtaining STD screening. We assessed interactions between exposure to prevention services and the other independent variables. We built separate logistic regression models for syphilis and gonorrhoea testing. We used a forward selection model, including independent variables with  $p$  values less than 0.05. Findings are presented as adjusted odds ratios with 95% CI. All analyses were performed using SAS version 9.1.

## RESULTS

During November 2003–April 2005, 23 861 individuals were approached. Eligibility interviews were completed with 19 488 individuals (82%), of whom 17 322 (89%) were eligible for participation. Of these 17 322, 14 049 (81%) agreed to participate, of whom 13 670 (97%) completed an interview. For our analysis, 3640 interviews were excluded because participants did not report having sex with another man during the 12 months before the interview, did not report being male, or reported being infected with HIV. A total of 10 030 individuals was included in the analysis.

Fifty-seven per cent of individuals were younger than 35 years and 44% were either Hispanic or black (table 1). Nineteen per cent of respondents reported that they had received HIV/STD prevention services in the past 12 months,

66% reported ever disclosing sexual activity with a man to a healthcare provider and 71% were classified as being at high risk of STD infection. A total of 3938 (39%) respondents reported having been tested for syphilis and 3629 (36%) respondents reported having been tested for gonorrhoea in the past 12 months. A total of 3385 (34%) of all individuals reported having been tested for both syphilis and gonorrhoea in the past 12 months.

The interaction between exposure to prevention services and MSA was significant in both the syphilis and gonorrhoea logistic regression models. The relative magnitude and direction of the relationship between prevention services and testing differed by MSA. Because this interaction improved the logistic regression model's fit when it was included, we controlled for it in both models but the interaction data are not presented. Five factors were independently associated with having been tested for syphilis or gonorrhoea in the past 12 months: age less than 45 years; black race; disclosure of sexual activity with a man to a healthcare provider; having private insurance and being in the high-risk category for acquiring an STD (table 2).

## DISCUSSION

The CDC STD treatment guidelines recommend annual laboratory testing for gonorrhoea at anatomical sites of exposure and a serological test for syphilis for all sexually active MSM. Despite this guidance, our analysis demonstrated that the proportion of MSM who reported having been tested for syphilis and gonorrhoea in the previous year was low: 39% reported having been tested for syphilis and 36% reported having been tested for gonorrhoea in the previous year. In 2006, data from eight US cities participating in the MSM prevalence monitoring project demonstrated that syphilis tests were performed at 83% of STD clinic visits and tests for urethral gonorrhoea were performed at 75% of clinic visits, followed by 40% and 53% for rectal and pharyngeal gonorrhoea, respec-

**Table 2** Factors associated with testing for syphilis and gonorrhoea in the past 12 months among 10 030 MSM: logistic regression analysis, National HIV Behavioural Surveillance System—MSM, 2003–5

Characteristic	Total n*	Syphilis testing Adjusted† OR (95% CI)	Gonorrhoea testing Adjusted† OR (95% CI)
Age group, years			
18–24	2186	2.2 (1.8 to 2.5)	2.7 (2.3 to 3.2)
25–34	3491	1.9 (1.7 to 2.2)	2.2 (1.9 to 2.6)
35–44	2935	1.3 (1.1 to 1.5)	1.4 (1.2 to 1.6)
≥45	1414	1.0 (Referent)	1.0 (Referent)
Race/ethnicity‡			
White	4510	1.0 (Referent)	1.0 (Referent)
Hispanic	2680	1.2 (1.1 to 1.4)	1.2 (1.0 to 1.3)
Black	1739	1.3 (1.1 to 1.4)	1.4 (1.2 to 1.6)
Other	993	1.0 (0.8 to 1.1)	1.0 (0.9 to 1.2)
Type of health insurance			
Private	6634	1.3 (1.1 to 1.4)	1.3 (1.1 to 1.4)
Public	427	1.1 (0.9 to 1.4)	1.2 (0.9 to 1.5)
None	2473	1.0 (Referent)	1.0 (Referent)
Disclosure of sex with men to healthcare provider			
Yes	6646	2.2 (2.0 to 2.5)	2.1 (1.9 to 2.3)
No	3163	1.0 (Referent)	1.0 (Referent)
Risk category			
High risk	7162	1.6 (1.5 to 1.8)	1.6 (1.5 to 1.8)
General risk	2868	1.0 (Referent)	1.0 (Referent)
Total	10 030		

\*Numbers might not add up to total because of missing data; †Also controlled for interaction term of exposure to prevention services and metropolitan statistical area; ‡Categories are mutually exclusive. MSM, men who have sex with men; OR, odds ratio.

tively.<sup>16</sup> Another analysis using data from this project evaluated the proportion of asymptomatic MSM tested for gonorrhoea at reported anatomical sites of exposure. The results showed that routine gonorrhoea testing is not conducted at all reported anatomical sites of exposure, with testing occurring in a median of 91% of patient visits reporting urethral exposure, 64% reporting rectal exposure and 74% reporting pharyngeal exposure.<sup>17</sup> These testing rates, although not comparable to our analysis due to differences in populations, testing venues, ascertainment of test results and procedures for testing, provide some context of STD testing among MSM in the USA.

One of the strongest predictors of STD testing in this analysis was age. Individuals under 45 years, and especially those 18–24 years of age, were more likely to have been tested for syphilis and gonorrhoea compared with individuals who were 45 years or older. Almost half of the 19 million new STD infections that occur each year are among young persons aged 15–24 years.<sup>18</sup> Providers may test younger MSM because they believe STD occur more frequently in this population. Alternatively, young persons may be more likely to seek STD testing because their partners/peers are being diagnosed with STD more frequently or because STD prevention messages are targeting them.

Black MSM were more likely than white MSM to have been tested for syphilis and gonorrhoea in the past 12 months. This may be a result of the higher incidence of syphilis and gonorrhoea among black compared with white individuals (six times and 18 times, respectively).<sup>19</sup> Although there has been an overall decrease in disparity in the incidence of STD over the last decade, black individuals remain disproportionately affected by gonorrhoea and syphilis in the USA.<sup>19</sup> Knowledge among healthcare providers of these disparities may lead to increased testing of black individuals.

Private health insurance compared with no insurance was associated with an increased likelihood of syphilis and gonorrhoea testing in the past 12 months. One-quarter of respondents reported that they did not have health insurance and individuals without health insurance may have, or believe they have, limited access to healthcare and to opportunities for STD screening.

Another strong predictor of STD testing was disclosure of sexual activity with a man to a healthcare provider. Stigma related to male–male sexual activity and HIV infection may keep men from disclosing that they have sex with men to their healthcare providers.<sup>20–21</sup> Public health measures that reduce stigma towards same-sex activity and HIV may increase MSM willingness to disclose sexual activity to healthcare providers. Because many MSM do not identify as gay, healthcare providers also cannot rely on patients' self-reported sexual identities to assess the risk of STD and HIV, but should initiate discussions about sexual behaviour, risks and testing with their patients.<sup>22</sup>

MSM who were classified as being at high risk in our analysis were more likely to have been tested for syphilis and gonorrhoea in the past 12 months. Of MSM who had ever reported disclosing sexual activity with men, 45% and 41% had been tested for syphilis and gonorrhoea in the past 12 months, respectively. This indicates that healthcare providers are missing opportunities to diagnose and treat STD among MSM. Among MSM, gonorrhoea can commonly infect non-urethral sites and many infections may be missed without routine rectal and pharyngeal screening.<sup>23</sup> Healthcare providers should test sexually active MSM for chlamydial and gonococcal infections at anatomical sites of exposure even in the absence of symptoms. Of NHBS–MSM participants, 47% reported having unprotected anal sex with a male partner during the preceding 12 months.

## Key messages

- ▶ Syphilis and gonorrhoea testing among men who have sex with men (MSM) was low, despite specific testing recommendations in the STD treatment guidelines.
- ▶ To increase STD testing among MSM, healthcare providers should assess the risks of STD for male patients through routine enquiries about sexual activity.

Even individuals who use condoms during sex may not be entirely protected from STD and may be incorrectly assuming that they are not at risk of STD and are not seeking routine screening.

There are several limitations to our findings. Our study was limited to individuals who resided in the 15 cities that participated in NHBS–MSM and attended venues identified as being places where MSM congregate, so these findings may not be generalisable to all MSM. Second, in defining individuals at high risk of STD, we did not have information about respondents' partners and we used casual partners as a surrogate for anonymous partners. This may have resulted in a less specific definition of risk and misclassification of the association of risk category with the likelihood of being tested for STD in the past year. Third, the data were self-reported and may be subject to recall or social desirability bias. Fourth, STD testing could have been performed for routine screening or for diagnostic purposes. Given the high recurrence of STD and the risk behaviours associated with STD, MSM tested for STD probably include those who were screened and those who underwent diagnostic testing.<sup>19</sup> Therefore, the proportion of respondents in this analysis who reported having been tested for an STD in the past 12 months may overestimate STD screening in this group. Fifth, NHBS–MSM did not collect data on the anatomical sites of exposure.

The CDC STD treatment guidelines include recommendations for routine testing for common STD in MSM. Despite these recommendations and the availability of effective treatments, self-reported STD screening among MSM remains low. Interventions to increase STD testing among MSM should focus on increasing healthcare providers' knowledge of STD screening recommendations and awareness that many individuals with STD are asymptomatic, as well as increasing MSM disclosure of sexual practices to healthcare providers. Enhanced programmatic efforts are needed to ensure that STD treatment guidelines are implemented for MSM and that programmes monitor adherence to these guidelines.

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**Competing interests:** None.

**Contributors:** ET, TS and AL conceived the study. All authors contributed to interpretation of data. All authors critically reviewed and contributed to the final draft and approved the final version for publication. 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.

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