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Cross-sectional survey comparing HIV risk behaviours of adolescent and young adult men who have sex with men only and men who have sex with men and women in the US and Puerto Rico

Jonathan M Ellen¹, Lauren Greenberg², Nancy Willard³, Stephanie Stines⁴, James Korelitz², Cherrie B Boyer⁵, and the Adolescent Medicine Trials Network for HIV/AIDS Interventions

¹Department of Pediatrics, All Children's Hospital Johns Hopkins Medicine, St Petersburg, Florida, USA

²Westat, Rockville, Maryland, USA

³Department of Pediatrics, Johns Hopkins University, Baltimore, Maryland, USA

⁴Children's National Medical Center, Washington, DC, USA

⁵Department of Pediatrics, University of California, San Francisco, San Francisco, California, USA

Abstract

Objective—To examine the HIV risk behaviours of men who have sex with men only (MSMO) and men who have sex with men and women (MSMW), aged 12–24 years, in five US cities and in San Juan, Puerto Rico.

Methods—Data were collected through four annual cross-sectional anonymous surveys at community venues and included questions about sexual partnerships, sexual practices including condom use and substance use. Demographic and risk profiles were summarised for both groups.

Results—A total of 1198 men were included in this analysis, including 565 MSMO and 633 MSMW. There were statistically significant differences between the two groups for many risk factors examined in multivariable models. MSMW were more likely to identify as bisexual, be in a long-term relationship, have a history of homelessness, have ever used marijuana, have ever been tested for HIV and to have been tested for HIV within the past 6 months. MSMW may be

Correspondence to Dr Jonathan M Ellen, All Children's Hospital, Johns Hopkins Medicine, 501 6th Avenue, St Petersburg, FL 33701, USA; jellen@jhmi.edu.

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more likely to ever exchange sex for money and ever have a sexually transmitted infection than MSMO.

Conclusions—MSMW were more likely to report several markers of socioeconomic vulnerability or behaviours associated with increased risk for HIV than MSMO. MSMW contribute to HIV prevalence in the USA, and better understanding of the risk profile of this group is essential to understand heterosexual HIV transmission. MSMW, particularly those who identify as bisexual or questioning, may feel uncomfortable participating in programmes that are designed for gay-identified men. Therefore, prevention strategies need to target distinct subgroups that compose the population of MSM.

INTRODUCTION

The predominance of new HIV infections in the USA occurs among men who have sex with men (MSM). In 2010, MSM accounted for 78% of new HIV infections among men and 63% of all new infections.¹ Men who have sex with both men and women (MSMW) are five times as likely to be HIV positive compared with men who have sex with women exclusively.²

Most previous studies of MSM have focused on older men (average age 30 years).² Young MSM are at disproportionate risk for HIV because of compounding issues such as substance use, unprotected sex and mental health burden.³ MSM, however, do not constitute a single, homogeneous group. There are at least two distinct subgroups consisting of MSMW and men who have sex with men only (MSMO). There may be important socio-demographic and behavioural differences between MSMW and MSMO that need to be understood to prepare and implement effective HIV prevention strategies and to further understand the MSMW impact on heterosexual HIV transmission. Thus, the current study focuses on HIV risk behaviours of adolescent and young adult MSMW and MSMO aged between 12 and 24 years.

METHODS

This analysis presents results from a substudy of the Connect to Protect (C2P) programme, implemented through the Adolescent Medicine Trials Network for HIV/AIDS Interventions (ATN), a National Institutes of Health-funded research network. C2P mobilises community coalitions to advocate for and assist in the development and enactment of structural changes aimed at reducing HIV risk among adolescents and young adults. All ATN/C2P sites focused on low-income, urban neighbourhoods with high rates of sexually transmitted infections (STIs). Furthermore, each site's coalition identified and prioritised a subpopulation of at-risk youth. This analysis includes data from five sites that prioritised young Black or Latino MSM (Los Angeles, Washington, DC, New York, San Francisco and Baltimore) and one site (San Juan, Puerto Rico) that prioritised youth who abuse substances, regardless of gender or sexual behaviours.⁴ Each participating site's Institutional Review Board reviewed and approved this study (reference NA_00004379).

Study design and recruitment procedures

Data were collected through four annual cross-sectional anonymous surveys at community venues between 2007 and 2010. The surveys measured multiple constructs, including sociodemographics, sexual partnerships, sexual practices including condom use, HIV testing and substance use.

Study recruitment occurred at venues where the population of focus was known to congregate (eg, clubs, parks, community centres), as identified through interviews with youth and coalition research. Details of the venue identification and selection process and the purposive sampling of youth in targeted high risk categories have been previously reported.⁵ In brief, each site used venue-based recruitment strategies, with interviewers approaching youth whom they perceived to belong to the target population about participating in a survey.

Surveys were administered via audio computer-assisted self-interview technology.⁶ The respondents were provided a private location to complete their interviews and no personal identifiers were collected. The same survey was administered to all respondents.

Eligibility criteria included (a) age 12–24 years (inclusive), (b) demographic and sexual orientation/experience profile reflective of the site's population of focus and (c) having engaged in consensual sexual activity during the past 12 months. This analysis focused solely on MSM who were identified as a sexual minority (gay, bisexual or questioning) and who were not identified as transgender. MSMO and MSMW categorisations were based on responses to the questions 'Have you ever had sex with a man?', and 'Have you ever had sex with a woman?'.

Statistical analysis

The sociodemographic and risk profiles of respondents were summarised separately for each subgroup (MSMO and MSMW). For categorical variables (eg, race), we report frequencies distributions (counts, percentages). For continuous variables (eg, number of partners), summary statistics (mean, median) were computed. Unadjusted statistical comparisons between the two subgroups were made using Fisher's exact test for categorical variables and the Wilcoxon signed-rank test for continuous variables. Multivariable analyses accounted for clustering by site and compared the two subgroups adjusting for significant covariates; logistic regression was used for categorical outcomes and multiple linear regression for continuous outcomes. No adjustment was made for multiple comparisons. Analyses were conducted using SAS V.9.3 (SAS Institute, Cary, North Carolina, USA).

RESULTS

Of 3528 young men approached, 2029 (57.5%) agreed to be screened for eligibility, 1802 (88.8%) were deemed eligible and 1778 (98.6%) of those eligible agreed to participate. Fifty-eight respondents who were reported to be of male gender by birth and were identified as transgender were excluded. The analysis pool was then limited to men who reported ever having sex with men (N=1338). Two respondents were excluded for refusing to provide an answer to the question 'have you ever had sex with a female?' and 14 respondents who

identified as straight were excluded. A total of 1322 respondents met the inclusion criteria for this analysis; however, 124 respondents were excluded because of incomplete survey data. Ultimately, 1198 male respondents were included in this analysis: 565 MSMO and 633 MSMW. The number of respondents and the percentages of MSMO versus MSMW were similar across all six sites; 105 MSM were recruited in Puerto Rico (focusing on substance-using youth), whereas the remaining MSM were recruited from sites targeting young MSM (196 in Los Angeles; 188 in Washington, DC; 251 in New York City; 296 in San Francisco and 162 in Baltimore).

Ninety per cent of MSMO were identified as gay, whereas 58% of MSMW were identified as gay and another 39% identified as bisexual. There were statistically significant percentage differences among the two subgroups for several risk factors (table 1). MSMW were more likely to report having an ongoing long-term relationship, a history of homelessness, marijuana use, HIV testing and recent HIV testing than MSMO. These differences remained significant after adjusting for potential confounders (including sociodemographic and behavioural factors). MSMW were also more likely to report ever using alcohol, injecting drugs, having an STI and exchanging sex for money than MSMO. Although the direction of these associations persisted in the adjusted analyses (ie, greater risk among MSMW), they were no longer statistically significant. MSMO were significantly more likely to report engaging in both protected and unprotected receptive anal sex than MSMW. Again, the direction of the associations remained in the adjusted analyses (ie, greater risk among MSMO), but was no longer statistically significant.

DISCUSSION

The extent to which the HIV-related risk behaviour profile of MSMW differs from MSMO is essential to understand the transmission dynamics of HIV infection and may affect plans for prevention strategies. In this study of younger MSM, the sociodemographic and overall risk profile of the respondents showed significant differences between MSMO and MSMW, with a higher reported prevalence of several risk behaviours among MSMW. This is consistent with research on adult MSMO and MSMW suggesting that these differences are apparent during a period when sexual identities, preferences and practices are developing and when youth may face different societal pressures regarding sexual behaviour.⁷⁻⁹ This consistency is also noteworthy given that our analysis, unlike most studies of MSMW, focused on youth who identified as sexual minority (the small number of straight-identified MSM were excluded from our analysis).

Data from the school-based Youth Risk Behavior Surveillance System (YRBSS) from 2001 to 2009 found that students who had sexual contact with both sexes were more likely to have used alcohol or drugs before their last sexual intercourse than students who had only ever had opposite-sex or same-sex partners.¹⁰ The YRBSS study included a representative national sample limited to in-school youth. Our study did not use a nationally representative statistical sampling frame; however, it included almost 1200 youth in five US cities and in Puerto Rico and older adolescents and young adults. Our study also focused on youth expected to engage in high-risk behaviours and included a significant number of young men of colour. Although our data were obtained from self-reports and responses could not be

validated against an external source (eg, medical records), steps were taken to promote accurate data collection. Though our study is not nationally representative or generalisable, the composition of our study population suggests that the observed associations between MSMW and MSMO may be relevant to youth populations in other low-income, urban neighbourhoods.

When MSM were separated into MSMW and MSMO, the HIV risk profiles of the two groups were substantially different. MSMW were more likely to report several markers of socioeconomic vulnerability or behaviours associated with increased risk for HIV than MSMO. Although some factors were no longer statistically significant in the adjusted analysis, the direction of the association indicated an increased risk among MSMW (eg, history of an STI, ever exchanged sex for money or past injection drug use). Other factors, including a history of homelessness or marijuana use remained statistically significant after controlling for confounders. Furthermore, MSMW, particularly those who identify as bisexual or questioning (a significant portion of our sample), may not feel comfortable participating in programmes that are designed for, or used exclusively by, young gay-identified men. Consequently, prevention messages and prevention strategies should be tailored for specific subpopulations of MSM.

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Table 1

Demographic and risk factor comparisons between MSMO and MSMW

	Total (N=1198)	MSMO (N=565)	MSMW (N=633)	Unadjusted p value	Adjusted p value	Adjusted OR (aOR; 95% CI)*
Age (years)						
Mean (SD)	20.7 (2.1)	20.4 (2.1)	20.9 (2.0)	<0.0001	0.0005	NA
Median	21.0	20.0	21.0			
IQR (25th–75th)	19.0, 22.0	19.0, 22.0	19.0, 23.0			
Min, Max	14.0, 24.0	14.0, 24.0	15.0, 24.0			
Number of partners last year						
Mean (SD)	8.3 (18.3)	7.7 (19.3)	8.8 (17.3)	0.0043	0.9091	NA
Median	3.0	3.0	4.0			
IQR (25th–75th)	2.0, 8.0	2.0, 6.0	2.0, 9.0			
Min, Max	1.0, 300.0	1.0, 300.0	1.0, 200.0			
Sexual orientation: n (%)						
Gay	878 (73.4)	510 (90.4)	368 (58.1)	<0.0001	<0.0001	Ref
Bisexual	282 (23.6)	35 (6.2)	247 (39.0)			0.093 (0.063 to 0.138)
Questioning	37 (3.1)	19 (3.4)	18 (2.8)			0.741 (0.376 to 1.460)
Ethnicity: n (%)						
White, non-Hispanic	82 (6.8)	48 (8.5)	34 (5.4)	0.0390	0.0022	Ref
Hispanic	510 (42.6)	247 (43.7)	263 (41.6)			0.627 (0.380 to 1.035)
Black, non-Hispanic	457 (38.2)	200 (35.4)	257 (40.6)			0.526 (0.315 to 0.879)
Mixed race	86 (7.2)	31 (5.5)	55 (8.7)			0.434 (0.226 to 0.835)
Other	63 (5.3)	39 (6.9)	24 (3.8)			1.429 (0.692 to 2.950)
Ever been homeless: n (%)						
Yes	343 (28.6)	128 (22.7)	215 (34.0)	<0.0001	0.0007	0.615 (0.465 to 0.815)
No	855 (71.4)	437 (77.4)	418 (66.0)			
Relationship status: n (%)						
In long-term relationship	228 (19.1)	89 (15.8)	139 (22.1)	0.0063	0.0085	0.665 (0.491 to 0.901)
Not in long-term relationship	966 (80.9)	475 (84.2)	491 (77.9)			
Ever used alcohol: n (%)						
Yes	988 (83.3)	451 (80.8)	537 (85.5)	0.0351	0.1709	0.770 (0.529 to 1.120)
No	198 (16.7)	107 (19.2)	91 (14.5)			
Ever used marijuana: n (%)						
Yes	709 (59.4)	303 (53.7)	406 (64.4)	0.0002	0.0170	0.718 (0.547 to 0.942)

	Total (N=1198)	MSMO (N=565)	MSMW (N=633)	Unadjusted p value	Adjusted p value	Adjusted OR (aOR; 95% CI)*
No	485 (40.6)	261 (46.3)	224 (35.6)			
Ever used drugs other than marijuana: n (%)						
Yes	275 (23.2)	119 (21.3)	156 (25.0)	0.1478	0.9333	0.986(0.710to1.369)
No	909 (76.8)	440 (78.7)	469 (75.0)			
Ever injected drugs: n (%)						
Yes	36 (13.3)	10 (1.8)	26 (4.2)	0.0181	0.1698	0.563 (0.248 to 1.278)
No	1143 (96.9)	546 (98.2)	597 (95.8)			
Ever received money in exchange for sex: n (%)						
Yes	223 (19.2)	81 (14.9)	142 (23.1)	0.0004	0.0726	0.733 (0.523 to 1.029)
No	937 (80.8)	463 (85.1)	474 (76.9)			
Ever had anal/vaginal sex without a condom: n (%)						
Yes	784 (66.2)	364 (65.0)	420 (67.3)	0.4239	0.8742	0.978 (0.745 to 1.284)
No	379 (32.0)	184 (32.9)	195 (31.3)			
Had unprotected receptive anal sex (among those who ever had unprotected sex): n (%)						
Yes	456 (58.7)	231 (64.2)	225 (54.0)	0.0044	0.1841	1.221 (0.910 to 1.638)
No	321 (41.3)	129 (35.8)	192 (46.0)			
Had protected receptive anal sex (among those who ever had protected sex): n (%)						
Yes	579 (63.6)	293 (69.6)	286 (58.4)	0.0005	0.0854	1.317 (0.962 to 1.803)
No	332 (36.4)	128 (30.4)	204 (41.6)			
Ever had an STI: n (%)						
Yes	329 (27.5)	128 (22.7)	201 (31.8)	0.0005	0.1121	0.787 (0.585 to 1.058)
No	868 (72.5)	436 (77.3)	432 (68.2)			
Diagnosed with an STI in the past 6 months: n (%)						
Yes	98 (8.2)	42 (7.5)	56 (8.9)	0.3993	0.8487	0.958 (0.620 to 1.482)
No	1098 (91.8)	522 (92.6)	576 (91.1)			
Ever been tested for HIV: n (%)						
Yes	1061 (88.8)	482 (85.6)	579 (91.6)	0.0012	0.0003	0.733 (0.523 to 1.029)
No	134 (11.2)	81 (14.4)	53 (8.4)			
Tested for HIV in the past 6 months: n (%)						
Yes	730 (61.7)	322 (57.9)	08 (65.0)	0.0141	0.0106	0.724 (0.565 to 0.927)
No	454 (38.3)	234 (42.1)	220 (35.0)			
HIV test results (self-report among those ever tested): n (%)						

	Total (N=1198)	MSMO (N=565)	MSMW (N=633)	Unadjusted p value	Adjusted p value	Adjusted OR (aOR; 95% CI) [*]
HIV positive	110 (10.4)	49 (10.2)	61 (10.6)	0.8999	0.3700 [†]	1.226 (0.785 to 1.914) [†]
HIV negative	912 (86.1)	414 (85.9)	498 (86.3)			
Indeterminate	17 (1.6)	9 (1.9)	8 (1.4)			
Did not return for result	20 (1.9)	10 (2.1)	10 (1.7)			

MSMO, men who have sex with men only; MSMW, men who have sex with men and women; STI, sexually transmitted infection.

* Each row variable in the table served as the dependent variable in a multivariable model that included MSMO/MSMW group and significant ($p < 0.05$) covariates (eg, age, number of partners in the last year, sexual orientation, race/ethnicity, relationship status, ever been homeless, ever used alcohol, ever used marijuana, ever used drugs other than marijuana, ever injected drugs, ever received money in exchange for sex, ever had sex without a condom, ever had unprotected receptive anal sex, ever had protected receptive anal sex, ever had an STI and ever tested for HIV). Only the OR associated with the MSMO/MSMW group in each model, with MSMW as the reference group, is shown.

[†] Because of the small numbers of MSMO and MSMW who did not return for their HIV test results or whose results were indeterminate, only those respondents with a self-reported result of HIV positive or HIV negative were included in the adjusted model.