

Changes in HIV Seroprevalence and Related Behaviors Among Male Injection Drug Users Who Do and Do Not Have Sex With Men: New York City, 1990–1999

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Injection drug users (IDUs) who are also men who have sex with men (MSM) continue to be at particularly high risk for HIV infection.^{1–9} In 1999, just over 23% of the AIDS patients in the United States with a history of injecting drugs were MSM.¹⁰ MSM IDUs may be more likely than other IDUs to engage in some injection and sexual risk behaviors^{5,11,12} and more likely than other MSM to engage in high-risk sexual behaviors.^{9,11,13} High-risk behaviors among MSM IDUs may serve as a bridge for HIV transmission to various other groups.⁹

In New York City, HIV seroprevalence,^{14,15} HIV seroincidence,¹⁶ and injection risk behaviors^{3,15} have declined among IDUs. Relatively little is known about differences between MSM IDUs and other male IDUs regarding trends in risk behaviors and HIV prevalence. This study examined trends in prevalent HIV infection and in injection risk behaviors among MSM IDUs and, comparatively, among other male IDUs between 1990 and 1999 in New York City.

METHODS

Data were collected as part of an ongoing series of studies of entrants to a drug detoxification program at Beth Israel Medical Center in New York City.^{14,15} Male subjects entering the program between January 16, 1990, and July 23, 1999, who were aged 18 years or older and had injected illicit drugs within the previous 6 months were eligible for inclusion. Potential participants were eligible to be interviewed once in any calendar year during which they remained behaviorally eligible, similar to procedures used by Battjes and colleagues¹⁷ and in the Centers for Disease Control and Prevention Family of Surveys.¹⁸

Subjects who reported having had sexual intercourse with another man during the 5 years

Objectives. This study examined HIV prevalence and risk behaviors among male injection drug users (IDUs) who have sex with men and among other male IDUs.

Methods. Male IDUs were interviewed and tested for HIV at a detoxification clinic during 1990 to 1994 and 1995 to 1999. Analyses compared male IDUs who do and do not have sex with men within and between periods.

Results. Initially, HIV seroprevalence and risk behaviors were higher among IDUs who have sex with men. Seroprevalence (initially 60.5% vs 48.3%) declined approximately 15% in both groups, remaining higher among those who have sex with men. Generally, injection prevalence, but not sexual risk behaviors, declined.

Conclusions. Male IDUs who have sex with men are more likely to engage in higher-risk behaviors and to be HIV infected. Improved intervention approaches for male IDUs who have sex with men are needed. (*Am J Public Health.* 2002;92:382–384)

preceding the interview were classified as MSM. Risk behaviors referred to the 6-month period preceding the interview. Trained interviewers administered a structured, face-to-face interview based on a modified version of the World Health Organization Multi-Centre Study of AIDS and Injecting Drug Use questionnaire.¹⁹ HIV counselors and phlebotomists provided pretest counseling before drawing blood. HIV-1 antibody replicate enzyme-linked immunosorbent assay testing was performed on all samples; Western blot testing was performed on all enzyme-linked immunosorbent assay-reactive and indeterminate samples.

Analyses

The period of observation was dichotomized into two 5-year intervals: 1990 to 1994 and 1995 to 1999. Chi-square and *t* tests were used to compare proportions and means, respectively, between MSM IDU and other male IDU groups, within and between time periods. Changes over time were analyzed by comparing the 2 time periods within and between MSM IDU and other male IDU groups. Cases without HIV results were retained in analyses of other relevant variables because proportions were similar between

groups. Items that changed significantly between time periods in one or both groups were included in logistic regression models predicting HIV seropositivity as a function of group and period. All statistical analyses used SAS software.²⁰

RESULTS

In general, MSM IDUs tended to be at least as likely as other male IDUs to engage in high-risk injection and sexual behaviors. Both groups of men reduced high-risk injection behaviors and increased protective injection behaviors over time (Table 1). However, neither group reduced its participation in commercial sex exchange, and only the other male IDU group increased condom use between the first and second periods.

MSM IDUs were significantly more likely to be HIV seropositive than were other male IDUs during the first period and tended to be so during the second period. They remained more likely to be HIV seropositive after adjustment for changes in the demographic and behavioral composition of the 2 groups (Table 2). HIV seroprevalence declined by approximately 15% between periods in each group.

TABLE 1—Changes in Risk and Protective Behaviors in Male Injection Drug Users Who Have Sex With Men and in Other Male Injection Drug Users: New York City, 1990–1999

	1990-1994		1995-1999		OR	95% CI
	n	%	n	%		
Injection behaviors						
Risk						
Distributive syringe sharing						
MSM	110	53.64	58	34.48	0.46	0.24, 0.88
Other men	1476	42.95	900	30.78	0.59	0.50, 0.70
OR	1.54		1.18			
95% CI	1.04, 2.26		0.68, 2.07			
Receptive syringe sharing						
MSM	110	52.73	58	41.38	0.63	0.33, 1.20
Other men	1477	35.00	901	28.63	0.74	0.62, 0.89
OR	2.07		1.76			
95% CI	1.41, 3.04		1.03, 3.01			
Protective						
Use of needle exchange						
MSM	110	20.91	58	56.90	4.99	2.55, 9.78
Other men	1470	25.31	901	46.84	2.60	2.19, 3.09
OR	0.78		1.50			
95% CI	0.49, 1.25		0.88, 2.55			
Sexual behaviors						
Risk						
Received money, goods, or drugs for sex with a woman						
MSM	111	5.41	27	7.41	1.40	0.27, 7.35
Other men	1472	2.17	672	1.79	0.82	0.42, 1.60
OR	2.57		4.40			
95% CI	1.08, 6.10		1.06, 18.23			
Gave money or drugs for sex with a woman (1992–1999)						
MSM	35	11.43	27	22.22	2.21	0.56, 8.72
Other men	670	15.07	677	16.84	1.14	0.85, 1.53
OR	0.73		1.41			
95% CI	0.25, 2.10		0.56, 3.56			
Protective						
Started or increased condom use						
MSM	35	62.86	51	58.82	0.84	0.35, 2.05
Other men	645	45.43	844	53.55	1.38	1.13, 1.70
OR	2.03		1.24			
95% CI	1.02, 4.06		0.70, 2.20			

Note. OR = odds ratio; CI = confidence interval; MSM = men who have sex with men.

DISCUSSION

This study relied on self-report data and was not based on a probability sample of the New York City IDU population (although the detoxification program from which subjects were recruited encompassed a wide geographic area). It may underrepresent both (1)

newer injectors, who may be more likely to be MSM,³ and (2) MSM IDUs, in that other male IDUs scored significantly higher on a self-deception subscale (added in 1995) than did MSM IDUs, suggesting possible underreporting of MSM IDUs. Data regarding sexual behavior with men during the last 6 months were not available.

Nevertheless, this study highlighted important developments affecting the HIV epidemic in New York City. HIV prevalence and HIV risk behaviors have declined among MSM in general²¹ and among IDUs in general^{3,14}; this paper shows that injection risk behaviors and HIV prevalence also have declined among MSM IDUs, who are at particularly high risk

TABLE 2—HIV Seroprevalence Among Male Injection Drug Users Who Have Sex With Men and Among Other Male Injection Drug Users: New York City, 1990–1999

	1990–1994	1995–1999	OR	95% CI	AOR ^a	95% CI
HIV positive, %						
MSM	60.5	43.8	0.51	0.24, 1.05	0.49	0.20, 1.13
Other men	48.3	33.4	0.54	0.44, 0.66	0.56	0.45, 0.70
OR	1.64	1.55				
95% CI	1.02, 2.64	0.86, 2.79				
AOR ^a	1.84	1.59				
95% CI	1.10, 3.14	0.81, 3.13				

Note. OR = odds ratio; CI = confidence interval; AOR = adjusted odds ratio; MSM = men who have sex with men.

^aAdjusted for variables that were significant ($P < .05$) in bivariate analyses: Hispanic, Black, high-school graduate, living in own home, injecting for 7 years or less.

for infection.^{1–3} Declining seroprevalence among MSM IDUs may be partially attributable to the effects of intervention efforts targeting MSM, as well as IDU populations, although it appears that such interventions have primarily affected injection risk. Injection risk behaviors declined among the IDUs in this study, whereas sexual risk behaviors did not. Although condom use increased among other male IDUs, it did not increase among MSM IDUs.

Few intervention programs target MSM IDUs specifically. The potential benefit of such targeted programs is unclear; in fact, none of the MSM drug users interviewed by Rhodes et al.⁹ saw any benefit to separate programs based on sexual orientation. These interviewees did indicate (and these findings confirmed) the need for multidimensional interventions with heightened sensitivity to and awareness of sexual orientation. Whether this can best be achieved through improvements to existing interventions or by developing approaches specific to MSM IDUs requires further research. Given the high-risk profile of MSM IDUs, such approaches should be prioritized for implementation and assessment in the near future. ■

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Contributors

C.B. Maslow and S.R. Friedman conceptualized, analyzed, and wrote this paper. T.E. Perlis consulted on the analysis and coordinated and implemented fieldwork and data collection with R. Rockwell. D.C. Des Jarlais provided general advice and consultation.

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References

- Marmor M, Des Jarlais DC, Cohen H, et al. Risk factors for infection with human immunodeficiency virus among intravenous drug abusers in New York City. *AIDS*. 1987;1:39–44.
- Jose B, Friedman SR, Neaigus A, et al. Syringe-mediated drug-sharing (backloading): a new risk factor for HIV among injecting drug-users. *AIDS*. 1993;7:1653–1660.
- Des Jarlais DC, Friedman SR, Perlis T, et al. Risk behavior and HIV infection among new drug injectors in the era of AIDS in New York City. *J Acquir Immune Defic Syndr Hum Retrovirol*. 1999;20:67–72.
- Deren S, Estrada A, Stark M, Williams M, Goldstein M. A multisite study of sexual orientation and injection drug use as predictors of HIV serostatus in out-of-treatment male drug users. *J Acquir Immune Defic Syndr Hum Retrovirol*. 1997;15:289–295.
- Wolitski R, Humfleet G, Lee J, Corby N. HIV risk-related practices of male homosexual, bisexual, and heterosexual injection drug users. In: Program and abstracts of the VIII International Conference on AIDS; July 19–24, 1992; Amsterdam, The Netherlands. Abstract PoC 4267.
- Friedman SR, Jose B, Deren S, Des Jarlais DC, Neaigus A, National AIDS Research Consortium. Risk

factors for HIV seroconversion among out-of-treatment injectors in high- and low-seroprevalence cities. *Am J Epidemiol*. 1995;8:864–874.

- Siegel HA, Carlson RG, Falck R, et al. HIV infection and risk behaviors among intravenous drug users in low seroprevalence areas in the Midwest. *Am J Public Health*. 1991;81:1642–1644.
- Wood MM, Rhodes F, Malotte CK. Pilot study of drug-using men who have sex with men: access and intervention strategies. In: Program and abstracts of the XI International Conference on AIDS; July 7–12, 1996; Vancouver, British Columbia. Abstract Tu.C.2412.
- Rhodes F, Deren S, Wood MM, et al. Understanding HIV risks of chronic drug-using men who have sex with men. *AIDS Care*. 1999;11:629–648.
- Centers for Disease Control and Prevention. *HIV/AIDS Surveillance Report: U.S. HIV and AIDS Cases Reported Through June, 1999*. Vol 11. Atlanta, Ga: Public Health Service; 1999.
- Bull S, Piper P, Rietmeijer C. The relationship between sex, drugs, and condom use among men who have sex with men and also inject drugs (MSM-IDU) in Denver. In: Program and abstracts of the XII International Conference on AIDS; June 30, 1998; Geneva, Switzerland. Abstract 23406.
- Stall R, Ostrow DG. Intravenous drug use, the combination of drugs and sexual activity and HIV infection among gay and bisexual men: The San Francisco Men's Health Study. *J Drug Issues*. 1989;19:57–73.
- Rebhook G, McFarland W, Katz M, et al. When worlds collide: sex, needles, and HIV infection among young injection drug using men who have sex with men. In: Program and abstracts of the XII International Conference on AIDS; June 30, 1998; Geneva, Switzerland. Abstract 23104.
- Des Jarlais DC, Perlis T, Friedman SR, et al. Declining seroprevalence in a very large HIV epidemic: injecting drug users in New York City, 1991–1996. *Am J Public Health*. 1998;88:1801–1806.
- Friedman SR, Chapman TF, Perlis TE, et al. Similarities and differences by race/ethnicity in changes of HIV seroprevalence and related behaviors among drug injectors in New York City, 1991–1996. *J Acquir Immune Defic Syndr*. 1999;22:83–91.
- Des Jarlais DC, Marmor M, Perlis T, et al. HIV incidence among injecting drug users in New York City, 1992–1997: evidence for a declining epidemic. *Am J Public Health*. 2000;90:352–359.
- Battjes RJ, Pickens RW, Brown LS Jr. HIV infection and AIDS risk behaviors among injecting drug users entering methadone treatment: an update. *J Acquir Immune Defic Syndr Hum Retrovirol*. 1995;10:90–96.
- Onorato IM, Gwinn M, Dondero TJ Jr. Applications of data from the CDC Family of Surveys. *Public Health Rep*. 1994;109:204–211.
- Stimson GV, Des Jarlais DC, Ball AL, eds. *Drug Injecting and HIV Infection: Global Dimensions and Local Responses*. London, England: UCL Press; 1998.
- SAS/STAT User's Guide, Version 6. Cary, NC: SAS Institute Inc; 1993.
- Gay Men's Health Crisis. *Sexual Health and Practices of Gay, Bisexual and Homosexually Active Men in New York City*. New York, NY: Gay Men's Health Crisis; June 1999.