

Trends in Sexual Risk-Taking among Urban Young Men Who Have Sex with Men, 1999–2002

Carolyn A. Guenther-Grey, MA; Sherri Varnell, PhD; Jennifer I. Weiser, MD; Robin M. Mathy, MSW, MSt, MA; Lydia O'Donnell, EdD; Ann Stueve, PhD; Gary Remafedi, MD; and the Community Intervention Trial for Youth (CITY) Study Team

Atlanta, Georgia; Minneapolis, Minnesota; Aberdeen, South Dakota; Newton, Massachusetts; Birmingham, Alabama; Chicago, Illinois; Los Angeles and San Francisco, California; and Milwaukee, Wisconsin

As part of an HIV prevention study, 15–25 year-old young men who have sex with men (YMSM) were surveyed in community settings annually from 1999 to 2002. Data are presented from six comparison communities in the study; these communities recruited Latinos (Jackson Heights, NYC; San Gabriel Valley, CA), African Americans (Atlanta, GA); Asians/Pacific Islanders (San Diego, CA); and primarily white men (Detroit, MI and Twin Cities, MN). Men were asked about unprotected anal intercourse (UAI) in the past three months with male partners. The prevalence of UAI reported in these six communities ranged 27–35% in 1999, compared with 14% to 39% in 2002. Significant reductions in UAI over time were observed in Jackson Heights and San Gabriel Valley. A quadratic trend was noted in Detroit, with a significant increase in UAI from 1999 to 2000 followed by a significant decrease in UAI from 2000 to 2002. There was a nonsignificant increase in UAI in the Twin Cities, and no significant trends in UAI in Atlanta or San Diego. Behavioral trends among YMSM vary considerably across subpopulations and highlight the necessity of local behavioral surveillance and culturally tailored prevention efforts for specific racial and ethnic groups.

Key words: HIV/AIDS ■ minority ■ gay and bisexual men ■ youth ■ sexual behavior

© 2005. From Division of HIV/AIDS Prevention, National Center for HIV, STD and TB Prevention, Centers for Disease Control and Prevention, Atlanta, GA (Guenther-Grey, Varnell); University of Minnesota Youth and AIDS Projects, Department of Pediatrics, Minneapolis, MN (Weiser, Remafedi); Presentation College, Aberdeen, SD (Mathy); Education Development Center, Newton, MA (O'Donnell, Stueve); and the CITY Study Team [John Peterson, Derrick Reese (Georgia State University); Leslie Clark, Patrick Packer, Charles Collins (University of Alabama, Birmingham); Robin Miller, Joseph Stokes (University of Illinois, Chicago); Wesley Ford, Ellen Iverson, George Weiss, Arthur Durazo (Children's Hospital Los Angeles); David Seal, Jeffrey Kelly, Anton Somlai, Yvonne Stevenson, Mike Brondino (Medical College of Wisconsin); Gary Remafedi (University of Minnesota, Minneapolis); Lydia O'Donnell, Ann Stueve, Alexi San Doval, Richard Duran (Education Development Center); Kyung-Hee Choi, Eugene Kumekawa, (University of California, San Francisco); Esther Sumartojo, Carolyn Guenther-Grey,

Sandra Wright-Fofanah, Lillian S. Lin, Joan Kraft, (CDC)]. Send correspondence and reprint requests for *J Natl Med Assoc.* 2005;97:385–435 to: Carolyn Guenther-Grey, Centers for Disease Control and Prevention, 1600 Clifton Road NE, Mailstop E37, Atlanta, GA, 30030; phone: (404) 639-1908; fax: (404) 639-1950; e-mail: CGuenther-Grey@cdc.gov

INTRODUCTION

Since the mid-1990s, there has been growing concern about a resurgence of risky sexual behavior in men who have sex with men (MSM), possibly leading to an increase in HIV transmission.¹⁻² Reviews of sexual behavior data suggest that rates of unprotected anal intercourse (UAI) have been increasing among MSM.¹⁻² There have also been outbreaks of syphilis and gonorrhea among MSM in U.S. cities³ and increases in newly diagnosed HIV infections among MSM from 1999 to 2002.⁴

Despite conflicting evidence about whether young MSM (YMSM) are more likely than older men to have UAI,⁵⁻⁸ surveys of YMSM in several U.S. cities indicate that their HIV risk behaviors merit attention. In a study of HIV risk among 15–22-year-old YMSM in seven U.S. cities from 1994 to 1998, Valleroy et al.⁹ interviewed and tested approximately 3,500 men from public venues. Four out of 10 (41%) reported UAI in the past six months (range: 33–49% across cities), and the prevalence of HIV infection was 7.2% (range: 2.2–12.1%). In a subsequent study of 23–29-year-old YMSM in six U.S. cities from 1998 to 2000, Valleroy et al.¹⁰ found 46% of 2,401 men reported UAI in the past six months (range: 41–53%), and HIV prevalence was

12.3% (range: 4.7–18%). Altogether, 77% of the men found to be HIV seropositive from 1994 to 2000 were unaware they were infected.¹¹ In both studies,^{9,10} HIV prevalence was higher in YMSM of color than among white YMSM. Among 23–29-year-olds, HIV prevalence was higher for African-American men—nearly one in three (30%) were infected with HIV—and Latino men (15%) than for white (7%) or Asian men (3%).¹⁰

Although these researchers and others¹²⁻¹³ provide valuable information about UAI in YMSM, few have studied temporal trends in sexual risk-taking among YMSM. Data collected over multiple time points in a specific community can capture trends in UAI and could be used to direct HIV prevention resources to areas of greatest need. In addition, data derived from different geographic regions and racial or ethnic groups can help us understand similarities or differences in behavioral trends. It is essential to address differences that influence YMSM's response to the HIV epidemic and their adoption of safer practices.

As part of a CDC-sponsored HIV prevention study, YMSM were surveyed annually from 1999 to 2002 in six U.S. communities. The data from these communities provide an opportunity to examine trends in the prevalence of UAI in different geographic areas and racial and ethnic groups.

SUBJECTS AND METHODS

The Community Intervention Trial for Youth (CITY) research study was a 13-community, randomized-control trial (RCT) designed to evaluate an HIV-prevention intervention for YMSM. A multicomponent intervention was implemented in seven of the communities. For this paper, data are presented from the six comparison communities where no study-related HIV prevention activities occurred, thus providing an opportunity to examine trends. Eligible participants were men ages 15–25 who reported sexual contact (i.e., oral or anal sex, or other physical contact leading to orgasm) with a male in the past year.

Because of an interest in identifying effective interventions for YMSM of various racial or ethnic groups, subsets of two-to-four intervention and com-

parison communities targeted specific racial or ethnic populations. In the six comparison communities, African Americans were sampled in Atlanta, GA; Asians and Pacific Islanders (APIs) were sampled in San Diego, CA; Latinos were sampled in Jackson Heights, New York City and San Gabriel Valley, CA; and participants of any race or ethnicity were sampled in the metropolitan areas of Detroit, MI and Minneapolis/St. Paul, MN (i.e., Twin Cities), although the majority of these participants were white.

A venue-based application of time-space sampling was used to obtain a cross-sectional sample of YMSM in these communities each year. After identifying venues frequented by YMSM (e.g., bars, coffeehouses, private house parties, parks, sexual establishments, community-based youth programs, Gay Pride events), local study staff created a sampling frame of four-hour venue/day/time (VDT) periods. A subset of VDTs was randomly selected for data collection each month from May through August 1999 to 2002.¹⁴

A total of 1,236 YMSM in 1999, 1,383 YMSM in 2000, 1,410 YMSM in 2001 and 1429 YMSM in 2002 were eligible and interviewed. Participants received \$10–\$20 (depending on the city), information on HIV transmission and prevention, and a list of local HIV-related services. Men interviewed one year were eligible to participate in future years if they were encountered in the venues, but we gathered no identifying information that would allow us to link participants from one year to the next.

Interview questions assessed demographic characteristics and sexual identity. Regarding sexual behaviors, men reporting anal sex in the past three months were asked about the number of partners, the number of times they had receptive and insertive anal sex, and the number of times condoms were used. They were also asked about the last sexual encounter with a main partner (e.g., a boyfriend, lover) or a nonmain partner. Their answers were used to create a variable of any UAI (receptive or insertive) in the past three months. In 2001 and 2002, participants were also asked if they knew the HIV test results of all male partners at the time they had UAI, and if the test results of any partners differed from their own. Study protocols and

questionnaires were approved by local program review panels and institutional review boards at the CDC and local communities.

To assess community-specific trends in self-reported UAI from 1999 to 2002, separate logistic regression models were fit for each community. In each model, we controlled for several demographic covariates because they were significantly associated with UAI in at least one community (data not shown) and varied across the four time points. These covariates included age, race or ethnicity, education, student status, and sexual identity. For models in which the quadratic term was nonsignificant ($p < 0.05$), a final model was fit with the quadratic term removed. Significance tests for linear and quadratic time trends were performed using likelihood-ratio Chi-squared tests.

RESULTS

Approximately 40% of participants were under age 21, with no significant change in the age distribution across years. There were small, statistically significant ($p < 0.01$ or greater) differences in the education, student status, sexual identity, and racial or ethnic composition of the annual panels. Each year, roughly one-third of the men identified as Latino (30–39%), one-fourth as African-American (22–25%) and white (25–30%), and the remainder as API (10–13%) or “other” (3–5%) (Table 1).

Significant reductions in UAI across all four years were observed in New York City and San Gabriel Valley where Latino men were interviewed. This steady reduction in UAI was not seen elsewhere (Table 2).

A significant increase in UAI from 1999 to 2002

Table 1. Participant Characteristics, Community Intervention Trial for Youth (CITY) Project, 1999–2002

Year	1999	2000	2001	2002	
Sample Size	N=1,203	N=1,367	N=1,396	N=1,407	
Variables	n (%)	n (%)	n (%)	n (%)	P
<i>Age</i>					0.0590
15–17	55 (5)	69 (5)	82 (6)	103 (7)	
18–20	391 (32)	459 (34)	477 (34)	462 (33)	
21–25	757 (63)	839 (61)	837 (60)	842 (60)	
<i>Race/Ethnicity</i>					0.0005
African/American	296 (25)	303 (22)	326 (23)	315 (22)	
Asian/Pacific Islander	153 (13)	131 (10)	154 (11)	152 (11)	
Latino/Hispanic	359 (30)	531 (39)	491 (35)	509 (36)	
White	360 (30)	344 (25)	360 (26)	370 (26)	
Other	35 (3)	58 (4)	65 (5)	61 (4)	
<i>Education</i>					<0.0001
<12 years	159 (13)	158 (12)	185 (13)	190 (13)	
High-school degree	327 (27)	423 (31)	535 (38)	490 (35)	
Some college	529 (44)	595 (44)	529 (38)	558 (40)	
College degree +	186 (16)	189 (14)	145 (10)	169 (12)	
<i>Sexual Identity</i>					0.0051
Gay/homosexual	844 (70)	945 (69)	1,008 (72)	1,055 (75)	
Bisexual	257 (21)	327 (24)	285 (20)	271 (19)	
Straight/don't know/other	102 (8)	95 (7)	103 (7)	81 (6)	
<i>Student Status</i>					<0.0001
Full-time	543 (45)	518 (38)	551 (40)	568 (40)	
Part-time	148 (12)	212 (16)	215 (15)	159 (11)	
Not a student	511 (43)	636 (47)	629 (26)	679 (48)	

was found in Detroit, where mostly white men were sampled. This increase was qualified by the presence of a quadratic trend reflecting a highly significant increase in UAI between 1999 and 2000 ($p < 0.01$), followed by a significant decrease in UAI from 2000 to 2002 ($p < 0.05$). A steady but nonsignificant increase in UAI was observed in Twin Cities. When we included only the white participants in the models, the increase in UAI in Twin Cities remained nonsignificant, and the quadratic trend was still present in Detroit. Since Latino men participated in Detroit and Twin Cities, we questioned if there was a downward trend in UAI among these men similar to that in New York and San Gabriel Valley. However, there were too few Latino participants in these communities to assess trends. There were no significant trends in UAI in Atlanta or San Diego.

In Atlanta, where African-American YMSM participated, UAI remained fairly constant over time. In contrast, among the API YMSM in San Diego, UAI fluctuated—with a nonsignificant increase in UAI between 2000 and 2001 and a decrease between 2001 and 2002.

Across localities, approximately one-third to one-half of men reported having UAI with a serodiscordant sex partner or not knowing their own or a partner's HIV status, both in 2001 (range across communities: 30–56%) and 2002 (range: 31–60%). In each year, approximately 80% of the participants

reported having been tested for HIV themselves, with <1% reporting that they were HIV-positive.

DISCUSSION

These data present a complex picture of trends in UAI among YMSM. The prevalence of UAI reported by these six subsets of YMSM was similar in 1999 (between 27% and 35%), but varied widely by 2002 (from 14% to 39%). One consistent trend was the significant reduction in UAI in the two metropolitan areas where Latino YMSM were sampled. No statistically significant trends in UAI were observed among APIs in San Diego or African Americans in Atlanta. Among the predominately white samples of YMSM, there was an initial increase, followed by a significant decline in UAI in Detroit and a steady but nonsignificant increase in Twin Cities. These data indicate that behavioral trends, even within similar subpopulations, may vary considerably by geographic region, and they underscore the potential dangers of generalizing findings beyond a study sample.

During the same time period as this study, newly diagnosed HIV infections among MSM increased in 29 states.⁴ HIV prevalence¹⁰ and incidence¹⁵ were highest among African-American and Latino YMSM. However, these data did not include the states of California, Georgia and New York, where four of our communities are located. In addition, other factors beyond UAI (e.g., size and density of

Table 2. Prevalence of Unprotected Anal Intercourse in YMSM in the Three Months Prior to Interview, CITY Project, 1999–2002

Year	1999		2000		2001		2002	
Sample Size	N=1,203		N=1,367		N=1,396		N=1,407	
Metropolitan Area (Participants' Ethnicity)	n/N	(%)	n/N	(%)	n/N	(%)	n/N	(%)
Variables								
New York City (Hispanic/Latino) ^a	78 /244	(32)	65 / 253	(26)	51/252	(20)	35/250	(14)
San Gabriel Valley (Latino/Hispanic) ^a	33/95	(35)	92/260	(35)	65/213	(30)	62/254	(24)
Atlanta (African-American)	68/246	(28)	68/249	(27)	62/258	(24)	58/242	(24)
San Diego (Asian/Pacific Islander)	43/123	(35)	37/111	(33)	61/143	(43)	52/134	(39)
Detroit (mostly white) ^{a,b}	76/252	(30)	108/247	(44)	110/289	(38)	98/278	(35)
Twin Cities (mostly white)	65/243	(27)	69/247	(28)	71/241	(29)	84/249	(34)

a Significant linear trend ($p < 0.05$), controlling for age, education, sexual identity and student status; b Significant quadratic trend ($p < 0.05$), controlling for age, education, sexual identity and student status

sexual networks) might influence HIV transmission rates.¹⁶ Injection drug use, concomitant sexually transmitted disease and use of highly active antiretroviral treatment might also affect HIV transmission among YMSM.³

In 2001 and 2002, approximately one-third to one-half of men reporting UAI had a sex partner whose HIV status was serodiscordant, or their own or a partner's serostatus was unknown, thus incurring risk for HIV infection or transmission. Recent phenomena, such as "barebacking" (defined here as intentional, unprotected anal sex), circuit parties, meeting partners via the Internet, and the use of "club drugs" (such as "crystal" methamphetamine), might be contributing to ongoing or increasing UAI but have usually been examined only in samples of older, white MSM.¹⁷⁻¹⁹ Research is needed to determine whether these phenomena have the same association with risk in YMSM of different racial, ethnic or geographic backgrounds.

This study has limitations. Data are self-reported and are subject to error in reporting and recall. In order to reduce recall error, men were asked to recollect behavior from only the past three months. Data were not obtained from all racial and ethnic groups at each community. Therefore, we do not know if the observed trends are representative of particular racial and ethnic groups or of the metropolitan areas that were sampled, and caution must be taken in generalizing our findings to all YMSM within specific racial or ethnic groups. In order to reduce selection bias, sampling frames included both large and small VDT and both gay-identified and nongay-identified venues, but the sampling strategy still might have underrepresented MSM who are more "hidden" in their communities and less likely to attend the venues.^{14,20} However, as MacKellar et al. note,²¹ it seems likely that most YMSM in a community can be sampled in some public venue, and venue-based sampling offers advantages over convenience sampling. Interviews needed to be brief in order to assure an acceptable response rate in community settings; this limited the number of sexual behavior questions in the inter-

view. Finally, knowledge of serostatus of all recent partners and sex with serodiscordant partners were not ascertained in 1999 and 2000. Nor were participants ever asked how many recent partners were "steady" or "casual" partners. Such data could clarify the risk associated with UAI, although even steady, presumably seroconcordant, HIV-negative partners who have UAI may be at risk if one partner is unknowingly HIV-infected.¹¹

These data highlight the importance of behavioral surveillance across different metropolitan areas and populations of MSM. In 2002, the CDC began funding state and local health departments to conduct HIV behavioral surveillance for MSM using time-space sampling. Sixteen metropolitan areas with high AIDS prevalence rates are expected to participate by the end of 2004. Expanded behavioral surveillance might improve our ability to identify and monitor HIV risk behavior trends and evaluate HIV prevention services.²²

ACKNOWLEDGEMENTS

The authors wish to thank Richard Wolitski and Ron Stall, DHAP, NCHSTP, CDC; and Helen M. Carol, University of Minnesota, for their thoughtful comments and assistance with this report.

REFERENCES

1. Stall RD, Hays RB, Waldo CR, et al. The Gay '90s: a review of research in the 1990s on sexual behavior and HIV risk among men who have sex with men. *AIDS*. 2000;14(Suppl 3):S101-S114.
2. Wolitski RJ, Valdiserri RO, Denning PH, et al. Are we headed for a resurgence of the HIV epidemic among men who have sex with men? *Am J Public Health*. 2001;91:883-888.
3. Ciesielski CA. Sexually transmitted diseases in men who have sex with men: an epidemiological review. *Current Infectious Disease Reports*. 2003;5:145-152.
4. Centers for Disease Control and Prevention. Increases in HIV diagnoses—29 states, 1999–2002. *MMWR Morb Mortal Wkly Rpt*. 2003;52:1145-1148.
5. McAuliffe TL, Kelly JA, Sikkema KJ, et al. Sexual HIV risk behavior levels among young and older gay men outside of AIDS epicenters: findings of a 16-city sample. *AIDS Behav*. 1999;3:111-119.
6. Mansergh G, Marks G. Age and risk of HIV infection in men who have sex with men. *AIDS*. 1998;12:1119-1128.
7. Van de Ven P, Noble J, Kippax S, et al. Gay youth and their precautionary sexual behaviors: the Sydney men and sexual health study. *AIDS Educ Prev*. 1997;9:395-410.
8. Dufour A, Alary M, Otis J, et al. Correlates of risky behaviors among young and older men having sexual relations with men, Montreal, Quebec, Canada. *J Acquir Immune Defic Syndr*. 2000;23:272-278.

9. Valleroy LA, MacKellar MA, Karon JM, et al. HIV prevalence and associated risks in young men who have sex with men. *JAMA*. 2000;284:198-204.
10. Valleroy L, Secura G, MacKellar D, et al. High HIV and risk behavior prevalence among 23–29-year-old men who have sex with men in six U.S. cities. 8th Conference on Retroviruses and Opportunistic Infections; February 4–8, 2001, Chicago, IL. Abstract 211.
11. MacKellar D, Valleroy L, Secura G, et al. Unrecognized HIV infection, risk behavior and misperception of risk among young men who have sex with men—six U.S. cities, 1994–2000. XIV International Conference on AIDS; July 7–12, 2002; Barcelona, Spain. Abstract MoPeC3427.
12. Ekstrand ML, Stall RD, Paul JP, et al. Gay men report high rates of unprotected anal sex with partners of unknown or discordant HIV status. *AIDS*. 1999;13:1525-1533.
13. Peterson JL, Bakeman R, Stokes J, and Community Intervention Trial for Youth Study Team. Racial/ethnic patterns of HIV sexual risk behaviors among young men who have sex with men. *Journal of the Gay and Lesbian Medical Association*. 2002;5:155-162.
14. Muhib FB, Lin LS, Stueve A, et al. A venue-based method for sampling hard-to-reach populations. *Public Health Rep*. 2001;116(Suppl 1):216-222.
15. McFarland W, Katz MH, Stoyanoff SR, et al. HIV incidence among young men who have sex with men—seven U.S. cities, 1994–2000. *MMWR Morb Mortal Wkly Rep*. 2001;50:440-444.
16. Bingham TA, Harawa NT, Johnson DF, et al. The effect of partner characteristics on HIV infection among African-American men who have sex with men in the young men's survey, Los Angeles, 1999–2000. *AIDS Educ Prev*. 2003;15 (Suppl A):39-52.
17. Halkitis PN, Parsons JT, Wilton L. Barebacking among gay and bisexual men in New York City: Explanations for the Emergence of Intentional Unsafe Behavior. *Arch Sex Behav*. 2003;32:351-357.
18. Colfax GN, Mansergh G, Guzman R, et al. Drug use and sexual risk behavior among gay and bisexual men who attend circuit parties: a venue-based comparison. *J Acquir Immune Defic Syndr*. 2001;28:373-379.
19. Benotsch EG, Kalichman S, Cage M. Men who have met sex partners via the Internet: prevalence, predictors and implications for HIV prevention. *Arch Sex Behav*. 2002;31:177-183.
20. Stueve A, O'Donnell LN, Duran R, et al. Time-space sampling in minority communities: results with young Latino men who have sex with men. *Am J Public Health*. 2001;91:922-926.
21. MacKellar D, Valleroy L, Karon J, et al. The Young Men's Survey: methods for estimating HIV seroprevalence and risk factors among young men who have sex with men. *Pub Health Reports*. 1996;111(Suppl 1):138-144.
22. Gallagher KM, Sullivan PS, Onorato I. A national system for HIV behavioral surveillance in the United States. 2003 National HIV Prevention Conference; July 27–30, 2003; Atlanta, GA. Abstract M3-B08-01. ■

We Welcome Your Comments

The *Journal of the National Medical Association* welcomes your Letters to the Editor about articles that appear in the *JNMA* or issues relevant to minority healthcare. Address correspondence to ktaylor@nmanet.org.