Sociodemographic, Sexual, and HIV and Other Sexually Transmitted Disease Risk Profiles of Nonhomosexual-Identified Men Who Have Sex With Men

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I examined sociodemographic, sexual, and HIV and other sexually transmitted disease risk differences among homosexual- and nonhomosexual-identified men who have sex with men (MSM) in the United States. Non-Mexican Latino ethnicity, marriage or cohabitation, religiosity, and incarceration history were positively associated with being nonhomosexual identified. Being nonhomosexual identified was associated with some risk (e.g., more sexual intercourse while intoxicated) and protective (e.g., fewer male partners) behaviors. Probabilistic sampling strategies may be useful in future research and intervention efforts. (*Am J Public Health*. 2009;99:1042–1045. doi: 10.2105/AJPH.2007.125674)

Does being nonhomosexual-identified affect sexual behaviors and susceptibility to HIV and other sexually transmitted diseases (STDs) in men who have sex with men (MSM)? Risk and protective factors have been found in relation to nonhomosexual identities, and nonhomosexual-identified and homosexual-identified MSM likely have different sociodemographic profiles.[1–13] However, because few studies use probability-based sampling methods, the scientific community's understanding of MSM may be limited.[5,6,13,14] In this study, I used a nationally representative, probabilistic sample to examine sociodemographic, sexual, and HIV or STD risk differences among nonhomosexual-identified and homosexual-identified MSM (Tables 1 and 2).

METHODS

Data were from the 2002 National Survey of Family Growth, a nationally representative, stratified-cluster sample of 4928 household-abiding males aged 15 to 44 years.[15] The response rate was 78%. I selected the subsample of 202 sexually active MSM, all with at least 1 past-year episode of anal intercourse or oral sex with a man, for inclusion in my study.

Sociodemographic measures consisted of self-reported nonhomosexual identity, race/ethnicity, age, years of education, annual household income, heterosexual marriage or cohabitation, religiosity, foreign birth, incarceration history, and small town or rural residence. Sexual behaviors included past-year contact with women, having 4 or more lifetime female or male partners, having 2 or more past-year female or male partners, having oral sex only (no anal intercourse) with men, and lifetime anal intercourse roles among those who had anal intercourse with men. Risk or protective behaviors consisted of STD history, HIV or STD testing, sexual intercourse while intoxicated with drugs or alcohol, sex in exchange for money or drugs, intravenous drug use, and condom use with most recent partners.

I used logistic regression analyses to model the relation of nonhomosexual identity to sociodemographic factors. I also used logistic regression models to predict the odds of possessing behavioral and risk characteristics as a function of being nonhomosexual identified. Sampling and design weights allowed the sample to represent MSM in the United States by adjusting for oversampling, nonresponse, noncoverage, and the stratified-cluster design.[16] I used SAS version 9.1.3 (SAS Institute Inc, Cary, NC) to perform all analyses.

RESULTS

Table 1 presents sociodemographic predictors of being nonhomosexual identified. Of the 202 MSM, 105 (52%) were nonhomosexual identified. Non-Mexican Latino ethnicity, heterosexual marriage or cohabitation, religiosity, and incarceration history were positively predictive of being nonhomosexual identified.

Table 2 contains results for behavioral and risk analyses. Relative to homosexual-identified MSM, nonhomosexual-identified MSM had statistically greater odds of past-year opposite-gender contact, 4 or more lifetime female partners (among those having opposite-gender contact), and only oral sex with men during all of their same-gender encounters. The odds of nonhomosexual-identified MSM having 4 or more lifetime male partners and both insertive and receptive anal intercourse with men during their lifetime were substantially lower than the odds for homosexual-identified MSM.

The only significant difference in risk behaviors between nonhomosexual-identified and homosexual-identified MSM occurred for being intoxicated with drugs or alcohol during past-year sexual encounters, with nonhomosexual-identified MSM having a higher odds compared with homosexual-identified MSM.

DISCUSSION

Recent studies have provided scientists with a better understanding of non homosexual-identified MSM's sociodemographic, sexual, and risk profiles.[6–9,17–22] Yet the sentiment that non homosexual-identified MSM are at greater risk for contracting HIV or STDs than are homosexual-identified MSM persists.[1,2] Supporting this belief is the notion that homosexual-identified MSM—identifiable via homosexual communities through which HIV and STD interventions are channeled—more readily receive preventive information.[5] Although this may be true, my results suggest that the sexual and risk profiles of nonhomosexual-identified and homosexual-identified MSM are comparatively complex.

Compared with homosexual-identified MSM, nonhomosexual-identified MSM had a higher odds of having 4 or more lifetime female partners, sexual intercourse while intoxicated with drugs or alcohol, and only receptive anal intercourse. However, nonhomosexual-identified MSM's greater likelihood of having only oral sex during their lifetimes, a lower number of male partners, and a lack of both insertive and receptive anal intercourse with men is consistent with the results of some studies.[2,6] The latter may explain why some have found nonhomosexual-identified MSM to have lower HIV rates than do homosexual-identified MSM.[10,23]

TABLE 1—Results of Logistic Regression Models of Nonhomosexual Identity Regressed on Sociodemographic Covariates: United States, National Survey of Family Growth, 2002

	Unweighted No.		Weighted %		Odds Ratio[a] (95% Confidence Interval)	
	Nonhomosexual	Homosexual Identified	Nonhomosexual Identified	Homosexual Identified	Unadjusted	Adjusted[b]
Race/ethnicity						
African American	27	14	19.0	10.7	2.85** (1.06, 7.66)	1.39 (0.50, 3.82)
Mexican	15	5	14.5	3.3	7.13† (2.54, 20.00)	2.21 (0.67, 7.35)
Non-Mexican Latino	17	11	13.9	6.0	3.74*** (1.44, 9.73)	2.95** (1.17, 7.44)
Other	2	2	4.4	2.3	3.11 (0.24, 40.98)	0.83 (0.03, 23.46)
White (Ref)	44	65	48.2	77.7	1.00	1.00
Age, y	. . .	. . .	29.5	32.0	0.96* (0.93, 1.00)	0.97 (0.93, 1.01)
Education, y	. . .	. . .	12.8	13.7	0.88* (0.78, 1.01)	0.98 (0.82, 1.16)
Income (14-category ordinal variable)[c]	. . .	. . .	7.7	9.5	0.89*** (0.82, 0.98)	0.98 (0.88, 1.09)
Married or cohabiting with a woman	14	4	20.2	1.8	13.45† (3.77, 48.04)	5.05** (1.26, 20.32)
Religiosity[d]	. . .	. . .	5.7	4.1	1.45† (1.21, 1.75)	1.33*** (1.07, 1.64)
Small town or rural residence	12	5	15.7	3.6	5.03† (1.98, 12.79)	2.30 (0.70, 7.59)
Incarceration (lifetime)	35	18	39.2	21.1	2.42** (1.06, 5.52)	2.39** (1.05, 5.45)
Foreign birth	19	8	14.5	5.4	2.97* (0.90, 9.81)	2.34 (0.61, 8.98)

Note. All analyses include the full sample (N = 202). Ellipses indicate the data were not applicable.
Source. Data are from the National Center for Health Statistics.[15]
[a]Homosexual-identified men who have sex with men (MSM) were the reference category.
[b]Multivariate analyses were adjusted for all sociodemographic predictors.
[c]The median income for nonhomosexual-identified MSM was between $20 000 and $24 999. The median income for gay-identified MSM was between $30 000 and $34 999.
[d]Religiosity was measured with an 8-category index based on attendance at religious events and the importance of religion.
*$P < .10$; **$P < .05$; ***$P < .01$; †$P < .001$.

This study confirmed findings from existing studies that non-Mexican Latino ethnicity,[2,12] heterosexual marriage or cohabitation,[6] religiosity,[24] and incarceration history[25] are correlates of nonhomosexual identification. The finding that African American ethnicity was not independently associated with being nonhomosexual identified emerged in multivariate modeling; researchers sometimes rely on bivariate tests when discussing African American MSM's inclination toward nonhomosexual identification.[2,12] Differences in sociodemographic and sexual profiles of nonhomosexual-identified and homosexual-identified MSM should be acknowledged to maximize the effectiveness of appropriate interventions.

Studies of nonhomosexual-identified MSM could be enhanced with laboratory-based HIV or STD test results, multiple and thorough measures of condom use, and larger sample sizes. These were limitations of this study.

Nonetheless, the use of probabilistic, nationally representative data sheds new light on the sociodemographic, sexual, and risk profiles of nonhomosexual-identified MSM. These data also confirmed findings from opportunistic samples, which suggests that such samples have provided relatively accurate depictions of nonhomosexual-identified MSM. This is encouraging, given researchers' doubts regarding the utility of nonprobabilistic data.[5,14] Nonetheless, when feasible, probabilistic sampling at national and local levels may be most appropriate for research efforts and interventions designed to curb the spread of HIV or STDs in this vulnerable population. ■

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Human Participant Protection

The institutional review board of the University of Florida regarded this study as exempt from review because the author used secondary, de-identified data. The Centers for Disease Control and Prevention approved all study protocols. The author entered into a user agreement with the National Center for Health Statistics for the acquisition of sexuality and risk data.

References

1. Centers for Disease Control and Prevention. STD communications database interviews with non-gay identified men who have sex with men (NGI MSM): final report. Available at: http://www.cdc.gov/std/HealthComm/NGI-MSMCompleteReport.pdf. Accessed February 11, 2007.

2. Goldbaum G, Perdue T, Wolitski R, et al. Differences in risk behavior and sources of AIDS information among gay, bisexual, and straight-identified men who have sex with men. *AIDS Behav.* 1998;2:13–21.

3. Goodenow C, Netherland J, Szalacha L. AIDS-related risk among adolescent males who have sex with males, females, or both: evidence from a state-wide survey. *Am J Public Health.* 2002;92:203–210.

4. Jin FY, Prestage G, Law MG, et al. Predictors of recent HIV testing in homosexual men in Australia. *HIV Med.* 2002;3:271–276.

TABLE 2—Results of Logistic Regression Models of Sexual Behavior Patterns and HIV or Sexually Transmitted Disease (STD) Risks Regressed on Non-Gay Identity: United States, National Survey of Family Growth, 2002

	Unweighted No.		Weighted %		Odds Ratio[a] (95% Confidence Interval)	
	Nonhomosexual Identified	Homosexual Identified	Nonhomosexual Identified	Homosexual Identified	Unadjusted	Adjusted[b]
Sexual behavior patterns						
Sexual contact with women, past y	55	6	56.7	6.8	17.89† (5.73, 55.86)	17.66† (5.18, 60.17)
≥4 female partners, lifetime	63	18	68.3	38.1	3.50*** (1.50, 8.17)	4.14*** (1.56, 10.97)
≥4 male partners, lifetime	53	82	57.9	90.8	0.14† (0.05, 0.36)	0.14† (0.05, 0.36)
≥2 female partners, past y[c]	28	1	52.3	40.3	1.62 (0.14, 18.65)	1.49 (0.13, 17.42)
≥2 male partners, past y	50	60	57.7	64.3	0.76 (0.37, 1.55)	0.90 (0.42, 1.93)
Oral sex only with men, lifetime	29	3	26.5	2.8	12.41† (3.12, 49.27)	12.13† (2.77, 53.02)
Insertive anal intercourse only with men, lifetime[d]	19	10	23.1	11.8	2.24* (0.86, 5.88)	3.16** (1.08, 9.19)
Receptive anal intercourse only with men, lifetime	11	4	26.6	3.0	11.90† (3.26, 43.44)	11.55† (2.68, 49.85)
Insertive and receptive anal intercourse, lifetime	46	80	50.3	85.2	0.18† (0.08, 0.41)	0.15† (0.06, 0.35)
HIV or STD risks						
STD treatment, past y	16	12	20.4	10.6	2.15 (0.61, 7.57)	1.81 (0.51, 6.38)
Chlamydia, past y[e]	7	3	40.1	23.5	2.18 (0.24, 19.95)	0.45 (0.02, 8.75)
Gonorrhea, past y	8	5	41.7	31.3	1.57 (0.19, 13.27)	0.31 (0.02, 4.80)
Genital warts, lifetime	12	12	12.1	9.7	1.29 (0.50, 3.33)	1.39 (0.52, 3.66)
Herpes, lifetime	13	9	12.8	11.4	1.15 (0.33, 3.96)	1.08 (0.29, 4.08)
Syphilis, lifetime	7	8	13.4	5.0	2.93* (0.88, 9.76)	3.23* (0.93, 11.30)
Condom use with last woman, lifetime	55	43	58.5	42.8	1.89* (0.96, 3.72)	1.79* (0.90, 3.57)
Condom use with last man, lifetime	48	42	49.0	38.1	1.56 (0.81, 3.01)	1.62 (0.81, 3.22)
HIV test, any, lifetime	75	87	68.5	85.5	0.37** (0.15, 0.90)	0.49 (0.18, 1.31)
STD test, past y	36	40	36.2	40.4	0.84 (0.41, 1.72)	0.81 (0.40, 1.66)
Sexual intercourse while intoxicated with drugs or alcohol (at least half the time), past y	27	17	28.2	16.0	2.06* (0.93, 4.54)	2.22** (1.05, 4.66)
Intravenous drug use, past y	4	2	5.9	1.1	5.56 (0.61, 50.65)	4.08 (0.60, 27.76)
Sex in exchange for money or drugs, past y	14	5	15.0	8.8	1.81 (0.49, 6.78)	1.82 (0.47, 7.09)

Source. Data are from the National Center for Health Statistics.[15]

[a]Homosexual-identified men who have sex with men (MSM) were the reference category.

[b]Odds ratios were adjusted for age, race/ethnicity, and educational level.

[c]Analyses for 2 or more female partners only included men who had sex with a woman in the past year.

[d]Measures for insertive, receptive, and both anal intercourse roles indicate lifelong behavior patterns among those who ever had anal intercourse. All 3 patterns are mutually exclusive.

[e]History of chlamydia and gonorrhea were assessed only for MSM treated for an STD in the previous year.

*P<.10; **P<.05; ***P<.01; †P<.001.

5. Mills TC, Stall R, Pollack L, et al. Health-related characteristics of men who have sex with men: a comparison of those living in "gay ghettos" with those living elsewhere. *Am J Public Health.* 2001;91:980–983.

6. Pathela P, Hajat A, Schillinger J, Blank S, Sell R, Mostashari F. Discordance between sexual behavior and self-reported sexual identity: a population-based survey of New York City men. *Ann Intern Med.* 2006;145:416–425.

7. Wolitski RJ, Jones KT, Wasserman JL, Smith JC. Self-identification as "down low" among men who have sex with men (MSM) from 12 US cities. *AIDS Behav.* 2006;10:519–529.

8. Wohl AR, Johnson DF, Lu S, et al. HIV risk behaviors among African American men in Los Angeles County who self-identify as heterosexual. *J Acquir Immune Defic Syndr.* 2002;31:354–360.

9. Finlinson HA, Colón HM, Robles RR, Soto M. Sexual identity formation and AIDS prevention: an exploratory study of nonhomosexual-identified Puerto Rican MSM from working class neighborhoods. *AIDS Behav.* 2006;10:531–539.

10. Kral AH, Lorvick J, Ciccarone D, et al. HIV prevalence and risk behaviors among men who have sex with men and inject drugs in San Francisco. *J Urban Health.* 2005;82(suppl 1):i43–i50.

11. Newman PA, Rhodes F, Weiss RE. Correlates of sex trading among drug-using men who have sex with men. *Am J Public Health.* 2004;94:1998–2003.

12. Rietmeijer CA, Wolitski RJ, Fishbein M, Corby N, Cohn D. Sex hustling, injection drug use, and non-gay identification by men who have sex with men: associations with high-risk sexual behaviors and condom use. *Sex Transm Dis.* 1998;25:353–360.

13. Schwarcz S, Scheer S, McFarland W, et al. Prevalence of HIV infection and predictors of high-transmission sexual risk behaviors among men who have sex with men. *Am J Public Health.* 2007;97:1067–1075.

14. Jeffries WL IV, Dodge B. Male bisexuality and condom use at last sexual encounter: results from a national survey. *J Sex Res.* 2007;44:278–289.

15. National Center for Health Statistics. Public Use Data File Documentation, National Survey of Family Growth Cycle 6: 2002. Available at: http://www.cdc.gov/nchs/

data/nsfg/UserGuide_2002NSFG.pdf. Accessed January 15, 2007.

16. Lepkowski JM, Mosher WD, Davis KE, et al. National Survey of Family Growth, Cycle 6: sample design, weighting, imputation, and variance estimation. Available at: http://www.cdc.gov/nchs/data/series/sr_02/sr02_142.pdf. Accessed April 6, 2009.

17. Harawa NT, Williams JK, Ramamurthi HC, Bingham TA. Perceptions towards condom use, sexual activity, and HIV disclosure among HIV-positive African American men who have sex with men: implications for heterosexual transmission. *J Urban Health.* 2006;83:682–694.

18. Mamary E, McCright J, Roe K. Our lives: an examination of sexual health issues using photovoice by non-gay identified African American men who have sex with men. *Cult Health Sex.* 2007;9:359–370.

19. Wheeler DP. Exploring HIV prevention needs for nonhomosexual-identified Black and African American men who have sex with men: a qualitative exploration. *Sex Transm Dis.* 2006;33(7):S11–S16.

20. Williams JK, Wyatt GE, Resell J, Peterson JL, Asuan-O'Brien A. Psychosocial issues among gay- and non-gay-identifying HIV-seropositive African American and Latino MSM. *Cultur Divers Ethnic Minor Psychol.* 2004;10:268–286.

21. Miller M, Serner M, Wagner M. Sexual diversity among Black men who have sex with men in an inner-city community. *J Urban Health.* 2005;82(suppl 1):i26–i34.

22. Mutchler MG, Bogart LM, Elliott MN, McKay T, Suttorp MJ, Schuster MA. Psychosocial correlates of unprotected sex without disclosure of HIV-positivity among African-American, Latino, and White men who have sex with men and women. *Arch Sex Behav.* 2008;37:736–747.

23. Catania JA, Osmond D, Stall RD, et al. The continuing HIV epidemic among men who have sex with men. *Am J Public Health.* 2001;91:907–914.

24. Stokes JP, Peterson JL. Homophobia, self-esteem, and risk for HIV among African American men who have sex with men. *AIDS Educ Prev.* 1998;10:278–292.

25. Alarid LF. Sexual orientation perspectives of incarcerated bisexual and gay men: the county jail protective custody experience. *Prison J.* 2000;80:80–95.

Hospitalized HIV-Infected Patients in the Era of Highly Active Antiretroviral Therapy

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We interviewed 1038 HIV-positive inpatients in public hospitals in Miami, Florida, and Atlanta, Georgia, to examine patient factors associated with use of HIV care, use of antiretroviral therapy, and unprotected sexual intercourse. Multivariate analyses and multiple logistic regression models showed that use of crack cocaine and heavy drinking were associated with never having had an HIV-care provider, high-risk sexual behavior, and not receiving antiretroviral therapy. Inpatient interventions that link and retain HIV-positive persons in primary care services could prevent HIV transmission and unnecessary hospitalizations. (*Am J Public Health.* 2009;99:1045–1049. doi:10.2105/AJPH.2008.139931)

Approximately one third of HIV-infected persons wait to seek care until their disease has progressed enough that they need acute treatment.[1,2] These persons obtain care in emergency departments and hospital inpatient wards, and they tend not to be retained in HIV outpatient care. Patients hospitalized for HIV-related complications are more likely to have advanced disease[3] and high viral loads, putting them at increased risk of transmitting HIV to their sexual and drug-using partners.[4] Thus, hospitals provide a potentially valuable setting for connecting HIV-infected patients to care and prevention services. To examine patient factors associated with engagement in high-risk sexual behaviors and utilization of HIV care, we conducted interviews with hospitalized HIV-infected patients in 2 large inner-city public hospitals.

METHODS

We conducted interviews with 1038 HIV-infected patients admitted to Jackson Memorial Hospital (Miami, FL) and Grady Memorial Hospital (Atlanta, GA) for HIV-related complications or associated illnesses during 2006 and 2007. Interviews were part of the screening process for Project HOPE (Hospitalized HIV-Infected Patients: A Population of Concern in the Era of HAART), a randomized controlled intervention trial designed to test a brief prevention intervention for HIV-positive crack cocaine users. We interviewed patients who were deemed medically and mentally stable by the attending physician and who provided verbal informed consent.

For our study, our dependent measures were (1) whether respondents had ever seen an HIV primary care provider, (2) whether respondents were currently using highly active antiretroviral therapy (HAART), and (3) whether respondents had unprotected sexual intercourse within the previous 6 months with a partner who was HIV negative or whose HIV status was unknown. We conducted univariate and bivariate analyses, and then we developed multiple logistic regression models to identify factors associated with the dependent measures.

RESULTS

The study population was mostly male (62%), 40 years or older (71%), and African American (82%); 40% did not graduate high school, 56% reported annual incomes of less than $5000, 19% reported living on the streets or in a shelter, 34% reported crack cocaine use, and 32% reported heavy alcohol use. The majority (68%) had received their HIV diagnosis more than 5 years ago. A substantial minority (20%) had never seen an HIV primary care provider, 40% had not seen an HIV primary care provider in the previous 6 months, 42% were taking antiretroviral therapy, and 10% reported high-risk sexual activity (Table 1).

There were significant results in each of the 3 regression models (Table 2). Crack use, heavy alcohol use, low income, and unstable housing were among the factors associated with the dependent measures.

DISCUSSION

These data suggest that hospitalized HIV-positive people are frequently not linked to or retained in HIV care and exhibit high-risk behaviors that may enhance transmission of HIV to others. Patients reporting these high-risk sexual behaviors were less likely to be currently receiving HAART; thus, they were