

Discordance between Sexual Behavior and Self-Reported Sexual Identity: A Population-Based Survey of New York City Men

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Background: Persons reporting sexual identity that is discordant with their sexual behavior may engage in riskier sexual behaviors than those with concordant identity and behavior. The former group could play an important role in the spread of sexually transmitted diseases.

Objective: To describe discordance between self-described sexual identity and behavior among men who have sex with men and associations between identity-behavior and risk behaviors.

Design: Cross-sectional, random digit-dialed telephone survey of health status and risk behaviors.

Setting: New York City.

Participants: Population-based sample of 4193 men.

Measurements: Concurrent measures of sexual identity and sexual behaviors, including number and sex of sex partners, condom use during last sexual encounter, and recent testing for HIV infection. Sex partner information was ascertained in a separate section from sexual identity; all participants were asked about the number of male sex partners and then were asked about the number of female sex partners in the past year.

Results: Of New York City men reporting a sexual identity, 12% reported sex with other men. Men who had sex with men exclu-

sively but self-identified as heterosexual were more likely than their gay-identified counterparts to belong to minority racial or ethnic groups, be foreign-born, have lower education and income levels, and be married. These men were more likely than gay-identified men who have sex with men to report having only 1 sexual partner in the previous year. However, they were less likely to have been tested for HIV infection during that time (adjusted prevalence ratio, 0.6 [95% CI, 0.4 to 0.9]) and less likely to have used condoms during their last sexual encounter (adjusted prevalence ratio, 0.5 [CI, 0.3 to 1.0]).

Limitations: The survey did not sample groups that cannot be reached by using residential telephone services.

Conclusions: Many New York City men who have sex with men do not identify as gay. Medical providers cannot rely on patients' self-reported identities to appropriately assess risk for HIV infection and sexually transmitted diseases; they must inquire about behavior. Public health prevention messages should target risky sexual activities rather than a person's sexual identity.

Ann Intern Med. 2006;145:416-425.

www.annals.org

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Men who have sex with men account for 45% of incident cases of HIV infection in the United States annually (1). Despite earlier declines in incidence rates of HIV infection among men who have sex with men (2, 3), recent data show increases in high-risk sexual behaviors (4, 5), sexually transmitted diseases (STDs) (6–9), and HIV diagnoses (10) among these men.

Previous research has found discordance between self-reported sexual identity and sexual behavior in men (11–13). Several reports (14–22) have focused on risk behaviors among men who have sex with men and acknowledge having male sexual partners but do not report a gay identity. Compared with gay-identified men who have sex with men, these men were less likely to use condoms during anal intercourse with other men (21) and less likely to have been recently tested for HIV infection (17). Because of secrecy about their sexual identity, these men may be distanced from the gay community, where most activities that focus on HIV prevention in men who have sex with men occur; therefore, they may have an increased risk for acquiring HIV infection and other STDs.

Current understanding of behavior and risk among non-gay-identified men who have sex with men has been largely gleaned from studies that used convenience samples, such as men at locations frequented for sexual encounters (16, 17, 20). Although numerous population-

based surveys have measured sexual behaviors, such as the sex and number of partners (23, 24), few have simultaneously measured adult respondents' self-reported sexual identities (11, 25). The aims of this study were to use concurrent measures of sexual identity and behavior to characterize the demographic characteristics and sexual behavior profiles of specific identity-behavior groups in a large, representative sample of New York City men.

METHODS

Survey Design

Between March and August 2003, the New York City Department of Health and Mental Hygiene conducted a survey to collect information on health status and risk behaviors among New York City residents. The Community

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Health Survey (CHS) is an annual cross-sectional survey based on the Centers for Disease Control and Prevention's (CDC) Behavioral Risk Factor Surveillance System. The survey includes about 130 questions on numerous health topics, such as health care access, physical activity, diabetes, immunizations, tobacco exposure, demographic characteristics, mental health, and sexual risk behaviors. The institutional review board at the New York City Department of Health and Mental Hygiene approved the survey.

The CHS sampled New York residents (≥ 18 years of age) using a stratified sample design to allow neighborhood estimation. The sampling frame was constructed by using residential telephone numbers provided by a commercial vendor. Households were selected by using a random digit-dialing method, and after all household members were enumerated, 1 adult was randomly selected to be interviewed. Interviews were conducted in English, Spanish, Chinese, and Russian, and a telephone translation service was used for survey participants who spoke only Greek, Korean, Yiddish, Polish, or Haitian Creole. Sample weights were constructed, accounting for the respondent's probability of selection within the household and a post-stratification factor (created by weighting each record up to the neighborhood population while accounting for the respondent's age, sex, and ethnicity) (26). In 2003, 9802 New York residents participated in the survey (59% cooperation rate), of whom 4193 (42.8%) were men and are the focus of this analysis.

Ascertainment of Sexual Identity and Sexual Behavior

Figure 1 shows the wording of key sexual identity and behavior questions. The sexual identity question, introduced in 2003, used the same wording as a question included in the Massachusetts Youth Risk Behavior Survey since 1995 (27), and response choices were read by the interviewer. Within the CHS instrument, this question was placed in the demographic characteristics section in the middle of the survey, deliberately separated from questions regarding sexual behavior, which were placed at the end. Consistent with the U.S. National Health and Nutrition Examination Survey (NHANES), sex was defined as oral, vaginal, or anal intercourse for questions regarding the number of male and female sexual partners and condom use. All respondents, regardless of sex, were asked about the number of male sex partners before they were asked about female sex partners. This ordering of questions differs from methodology in other large in-person surveys (for example, NHANES) and audio computer-assisted self-interviewing surveys (for example, National Survey of Family Growth), in which participants are questioned first about opposite-sex partners or in which other formats and ordering of questions are used. Questions about history of testing for HIV infection and condom use were also asked (Figure 2). There were 4 questions to ascertain history of STDs (Figure 2); for our analysis, a person who answered yes to any of these 4 questions was considered to have a history of STDs.

Context

Self-identification of sexual orientation may not accurately reflect actual sexual practices.

Contribution

These investigators performed a population-based health survey of men living in New York City and found that almost 10% who self-identified as straight had at least 1 sexual encounter with another man during the previous year. These men were less likely than self-identified gay men to have been tested for HIV infection or to have used a condom during their most recent sexual encounter.

Implications

Physicians cannot rely on self-identification of sexual orientation to assess the likelihood of risky behavior. They must ask specific questions about sexual practices.

—The Editors

Construction of Sexual Identity–Behavior Groups

For participants who reported sexual activity in the past year and answered the question regarding sexual identity, information regarding sex of the participant, sex of sex partner or partners, and self-reported sexual identity was used to construct identity–behavior groups. Groups included straight-identified men who have sex only with women, gay-identified men who have sex only with men, and straight-identified men who have sex only with men. The term *non-gay identified* was not used to describe the last group because most reports of non-gay-identified men who have sex with men include bisexual men, who were excluded from our analysis.

Gay-identified men who reported having sex with women only were excluded from the analysis, because few men belonged to that group. Behaviorally bisexual persons have been found to differ in behavior and risk from those who exhibit exclusively homosexual behavior (28). Persons who reported bisexual identity or behavior were enumerated but were excluded from the main analysis. Therefore, the identity–behavior groups that we examined consisted of men who exhibited purely heterosexual behavior or purely homosexual behavior in the year before the survey.

Validity and Reliability of Key Survey Questions

To determine the reliability of answers to the questions regarding sexual behavior, we compared the 2003 and 2002 surveys. For both surveys, questions regarding the sex and number of sexual partners were placed at the end; however, the wording of the questions was different. In 2002, survey participants were asked, “During the past 12 months, with how many people have you had sex, including oral sex?” and were then asked, “During the past 12 months, have you had sex with only males, only females, or with both males and females?”

We hypothesized that the language in which the inter-

Figure 1. Sexual Identity and Sexual Behavior Questions in the 2003 Community Health Survey

Identity (Demographic Module)

Question: Which of the following best describes you?

1. Heterosexual (straight)
2. Gay or lesbian
3. Bisexual
4. Don't know/not sure
5. Declined

Behavior (Sexual Behavior Module)

Question: During the past 12 months, with how many men have you had sex?

Interviewer read the following: By sex we mean oral, vaginal, or anal sex, but NOT masturbation.

_____ Number of male sex partners

Question: During the past 12 months, with how many women have you had sex?

_____ Number of female sex partners

view was conducted could have influenced respondents' answers regarding sexual identity. To examine this influence, we compared responses to the identity question for foreign-born and U.S.-born men and compared those surveyed in English with those surveyed in Spanish.

Statistical Analysis

The number, weighted number, and weighted percentage of sexually active men in each of the sexual identity–behavior categories were calculated. Demographic and risk characteristics were described for 3 analytic subgroups: straight-identified men who have sex with women, straight-identified men who have sex only with men, and gay-identified men who have sex only with men. In the univariate analysis, nonoverlapping 95% CIs indicated statistically significant differences for prevalence estimates between groups. An estimate was considered unstable if its relative standard error was greater than 30%, in other words, if the standard error of the survey estimate divided by the estimate itself was greater than 0.3 (29). To determine whether straight-identified men who have sex with men reported riskier behaviors than gay-identified men who have sex with men, we used gay-identified men who have sex with men as the referent group and examined 4 outcomes of interest: history of STDs, testing for HIV infection in the past year, no condom use during last sexual encounter, and risky sexual behavior. Risky sexual behavior was defined as a combination of 2 response categories: 2 or more sexual partners in the previous year and no condom use during the last sexual encounter. The nonrisky group consisted of men who had more than 1 sexual partner and used condoms and those who had exactly 1 sexual partner, regardless of condom use.

Multivariate models assessed associations between these outcomes and the 2 identity–behavior groups among men who have sex with men, while including other demographic and behavioral covariates found to be statistically significant in the univariate analysis or relevant based on a priori knowledge. Homogeneity tests were conducted to assess effect measure modification. Adjusted prevalence ratios and 95% CIs were calculated by using predicted mar-

Figure 2. Sexual Risk Behavior Questions in the 2003 Community Health Survey

HIV Testing Module

Question: Have you had an HIV test during the last 12 months? Do not count tests you may have had as part of a blood donation.

1. Yes
2. No
3. Don't know/not sure
4. Declined

Sexual Behavior Module

Question: The last time you had sex, did you or your partner use a condom?

Interviewer if asked: This includes the "female condom"

1. Yes
2. No
3. Don't know/not sure
4. Declined

Question: Has a doctor or other health care professional ever told you that you had genital herpes?

1. Yes
2. No
3. Don't know/not sure
4. Declined

Question: Has a doctor or other health care professional ever told you that you had genital warts?

1. Yes
2. No
3. Don't know/not sure
4. Declined

Question: In the past 12 months, has a doctor or other health care professional told you that you had gonorrhea, sometimes called "GC" or "the clap"?

1. Yes
2. No
3. Don't know/not sure
4. Declined

Question: In the past 12 months, has a doctor or other health care professional told you that you had chlamydia?

1. Yes
2. No
3. Don't know/not sure
4. Declined

Table 1. Self-Reported Sexual Identity and Sexual Behavior, 2003 Community Health Survey, New York City

Sexual Behavior in the Previous 12 Months and Sexual Identity	Nomenclature	Participants, n	Estimated Population Size, n*	Estimated Proportion of Total Sample, %
Sex with women only		2531	1 703 600	86.4
Straight†	Straight-identified men who have sex with women	2511	1 692 300	85.8
Gay	Gay-identified men who have sex with women	5	2700	0.1
Bisexual	Bisexual-identified men who have sex with women	15	8600	0.5
Sex with men only		337	244 100	12.4
Straight†	Straight-identified men who have sex with men	206	175 300	8.9
Gay†	Gay-identified men who have sex with men	121	65 600	3.3
Bisexual	Bisexual-identified men who have sex with men	10	3200	0.2
Sex with men and women		30	24 000	1.2
Straight	Straight-identified men who have sex with men and women	18	13 700	0.7
Gay	Gay-identified men who have sex with men and women	2	1800	0.1
Bisexual	Bisexual-identified men who have sex with men and women	10	8500	0.4
Total		2898	1 971 600	100

* Weighted number is rounded to the nearest 100.

† Main analytical group.

ginal proportions (30). Analyses were conducted by using SUDAAN software (Research Triangle Institute, Research Triangle Park, North Carolina) to obtain appropriate standard errors for point estimates.

Role of the Funding Source

This study was not funded.

RESULTS

Male Survey Participants

Among men, 91.3% reported straight or heterosexual identity, 3.7% reported gay identity, 1.2% reported bisexual identity, 1.7% responded “not sure or don’t know,” and 2.1% declined to answer the question. Of men who answered the questions regarding the number and sex of their sex partners, 70.6% reported having sex with only women, 9.3% reported having sex with only men, 0.8% reported having sex with men and women, and 19.3% reported no sexual activity during the past year. The final sample for which identity–behavior groups were constructed consisted of men reporting sexual partners in the previous year who also reported a straight, gay, or bisexual sexual identity; this included approximately 69% of 4193 surveyed men. Demographic characteristics of the 2898 men who were included and the 1295 men who were excluded were largely similar; however, the men who were not included were more likely to be older (>65 years of age) and to report a divorced, separated, or widowed marital status. Table 1 details the number of men in the sexual identity–behavior groups.

The remaining analysis focused on straight-identified men who have sex with women (concordant identity–behavior), straight-identified men who have sex with men (discordant identity–behavior), and gay-identified men who have sex with men (concordant identity–behavior). Of the men in these 3 weighted groups, 96.6% identified as straight and 3.4% identified as gay. Of the straight-

identified men, 9.4% reported having sexual intercourse with at least 1 man (and no women) in the year before the survey. Thus, 87.5% of men in the 3 groups exhibited exclusively heterosexual behavior and 12.5% demonstrated exclusively homosexual behavior. Among men who have sex with men, 72.8% identified as straight.

Key Analytic Subgroups

There were no substantial age differences between straight-identified men who have sex with women, gay-identified men who have sex with men, and straight-identified men who have sex with men; approximately half of the men in each group were between 25 and 44 years of age. Straight-identified men who have sex with men were more likely than gay-identified men who have sex with men (62% vs. 28%) to report belonging to minority racial or ethnic groups (Table 2). Straight-identified men who have sex with men were also more likely than gay-identified men who have sex with men to have been born in a foreign country. Among foreign-born, straight-identified men who have sex with men, 33% were from Latin America; 30% were from the Caribbean; and 32% were from Europe, Asia, or Africa.

Approximately 70% of straight-identified men who have sex with men reported being married, which was substantially more than any other identity–behavior group: 54% of straight-identified men who have sex with women and only 0.2% of gay-identified men who have sex with men reported being married. Gay-identified men who have sex with men were more likely than the men in the other groups to report a higher educational level, a higher annual income, and residence in Manhattan.

Table 3 shows the differences in behaviors and health status among straight-identified men who have sex with women, gay-identified men who have sex with men, and straight-identified men who have sex with men. Straight-identified men who have sex with women and straight-

Table 2. Age-Adjusted Weighted Percentages of Selected Demographic Characteristics for Concordant and Discordant Identity–Behavior Groups*

Variable	Straight-Identified Men Who Have Sex with Women (n = 2511) (95% CI), %	Men Who Have Sex with Men (95% CI), %		
		Straight-Identified (n = 206)	Gay-Identified (n = 121)	Total (n = 337)†
Age‡				
18–24 y	12.6 (11.0–14.3)	16.5 (10.9–24.1)	11.2 (5.6–21.2)§	15.3 (10.8–21.2)
25–44 y	50.7 (48.3–53.0)	51.7 (43.8–59.6)	59.5 (48.7–69.5)	53.6 (47.1–59.9)
45–64 y	28.4 (26.4–30.6)	25.7 (19.4–33.1)	26.2 (18.0–36.4)	25.8 (20.7–31.7)
≥65 y	8.4 (7.2–9.7)	6.1 (3.3–11.2)§	3.1 (0.7–12.4)§	5.3 (3.0–9.2)
Ethnicity				
Non-Hispanic white	41.7 (39.5–44.0)	37.6 (30.1–45.6)	72.1 (62.1–80.3)	46.3 (39.6–53.1)
Non-Hispanic black	21.1 (19.3–23.1)	23.2 (17.2–30.5)	7.2 (3.5–14.0)§	18.9 (14.2–24.6)
Hispanic	24.5 (22.5–26.6)	29.1 (22.0–37.4)	15.7 (9.0–25.9)	26.2 (20.3–33.1)
Asian, multiple race, or other	12.7 (11.1–14.4)	10.1 (6.3–15.9)	5.0 (1.9–12.8)§	8.7 (5.5–13.4)
U.S. born				
Yes	56.9 (54.5–59.3)	56.9 (48.5–64.8)	85.2 (77.6–90.5)	63.7 (56.6–70.2)
No	43.1 (40.7–45.5)	43.1 (35.2–51.5)	14.8 (9.5–22.4)	36.4 (29.8–43.4)
Marital status				
Married	54.0 (51.8–56.1)	69.6 (62.1–76.1)	0.2 (0.03–1.4)§	51.1 (44.4–57.8)
Partnered	5.6 (4.6–6.8)	2.5 (0.7–8.1)§	22.6 (15.6–31.5)	8.1 (5.5–11.8)
Not married	40.5 (38.3–42.6)	27.9 (21.7–35.2)	77.2 (68.3–84.2)	40.8 (34.4–47.5)
Education level				
Less than high school	13.7 (12.1–15.5)	15.6 (10.1–23.3)	2.3 (0.5–9.5)§	12.2 (7.9–18.5)
High school	25.3 (23.2–27.5)	31.9 (25.1–39.5)	6.1 (2.3–15.1)§	25.8 (20.1–32.5)
Greater than high school	61.0 (58.6–63.3)	52.5 (45.4–59.5)	91.6 (82.3–96.2)	62.0 (55.4–68.1)
Annual household income				
<\$25 000	29.7 (27.5–39.1)	39.2 (31.7–47.3)	12.2 (6.8–20.8)	33.2 (26.8–40.2)
\$25 000–\$49 999	26.6 (24.5–28.8)	21.2 (15.4–28.4)	27.6 (17.2–41.2)	22.3 (17.2–28.3)
≥\$50 000	36.0 (33.8–38.3)	30.9 (24.4–38.3)	54.5 (41.6–66.8)	36.5 (30.5–42.9)
Don't know or declined to answer	7.8 (6.5–9.2)	8.7 (5.1–14.4)	5.7 (2.2–13.6)§	8.1 (5.1–12.5)
Employment				
Employed	72.9 (70.9–74.9)	61.7 (55.2–67.8)	70.5 (56.8–81.2)	63.6 (58.1–68.7)
Unemployed	8.0 (6.8–9.4)	7.9 (4.2–14.3)§	8.4 (4.8–14.1)	9.0 (5.7–14.0)
Out of work force	19.1 (17.4–20.8)	30.3 (24.4–37.1)	21.2 (11.8–35.0)	27.4 (22.4–33.1)
Borough of residence				
Bronx	14.1 (12.6–15.8)	18.1 (12.4–25.8)	8.9 (4.2–17.9)	15.7 (11.0–21.8)
Brooklyn	30.2 (28.3–32.3)	35.8 (28.4–43.9)	12.7 (7.6–20.5)	30.2 (24.3–36.8)
Manhattan	21.2 (19.5–23.0)	11.8 (7.5–18.0)	56.4 (44.4–67.7)	24.0 (19.0–29.9)
Queens	29.1 (27.1–31.1)	25.7 (19.0–33.7)	21.1 (12.0–34.3)	23.5 (17.9–30.1)
Staten Island	5.4 (4.6–6.4)	8.6 (4.9–14.6)	1.0 (0.2–4.9)§	6.7 (3.8–11.5)

* The weighted numbers were rounded to the nearest hundredth. They were 1 692 300, 175 300, 65 600, and 249 400 for straight-identified men who have sex with women, straight-identified men who have sex with men, gay-identified men who have sex with men, and the total number of men who have sex with men, respectively.

† Includes straight-, gay-, and bisexual-identified men who have sex with men only.

‡ Not age-adjusted.

§ Denotes unstable estimates.

|| Statistically significant difference in prevalence estimate, comparing straight-identified and gay-identified men who have sex with men.

identified men who have sex with men reported having fewer sexual partners than gay-identified men who have sex with men; 15% of straight-identified men who have sex with women, 2% of straight-identified men who have sex with men, and 33% of gay-identified men who have sex with men reported having 3 or more partners in the previous year. Almost 96% of straight-identified men who have sex with men reported having only 1 sex partner in the past year.

The overall prevalence of previous STDs among men in the 2003 CHS was low (5%). Straight-identified men who have sex with women (4%) and straight-identified men who have sex with men (7%) were less likely than gay-identified men who have sex with men (20%) to report a previous STD. However, straight-identified men who have sex with women and straight-identified men who have sex with men were less likely than gay-identified men who have sex with men, particularly those with only 1 sexual

partner in the past year, to report using a condom during their last sexual encounter. More than half of gay-identified men who have sex with men reported using a condom during their last sexual encounter, a rate substantially higher than the overall rates of condom use among straight-identified men who have sex with women and straight-identified men who have sex with men.

The overall prevalence of risky sexual behavior (≥ 2 sexual partners and no condom use during last sexual encounter) was low (7%). Straight-identified men who have sex with women (7%) and straight-identified men who have sex with men (1%) were less likely than gay-identified men who have sex with men (14%) to report risky behavior. The 3 groups were not statistically significantly different regarding testing for HIV infection in the past year.

Influence of Identity–Behavior Group on Risk Behaviors among Men Who Have Sex with Men

Multivariate models (Table 4) show independent risk factors related to testing for HIV infection, condom use, risky behavior, and history of STDs among men who have sex with men, including the influence of identity-behavior group on these outcomes. Recent testing for HIV infection among men who have sex with men was associated with younger age, minority race or ethnicity, and gay identity. Straight-identified men who have sex with men were approximately 40% less likely than gay-identified men who have sex with men to have had such testing.

Condom use during the last sexual encounter was as-

sociated with younger age, higher number of sexual partners, and gay identity. Straight-identified men who have sex with men were half as likely as gay-identified men who have sex with men to have used a condom during their last sexual encounter. Gay identity was positively associated with risky behavior; straight-identified men who have sex with men were approximately half as likely to have reported risky behavior. History of STDs was not associated with sexual identity among men who have sex with men.

Validity and Reliability of Key Survey Questions

The weighted estimate of the rate of same-sex behavior among all sexually active men in New York City (12.2%) was similar to that in the 2002 CHS (9.5%), despite the use of a different sequence of questions to determine the status of sexual partners.

A total of 90% of men completed the English-language survey, 8% completed the Spanish-language version, and the remaining 2% completed the survey in other languages. Of U.S.-born men, 99% completed the English-language survey and almost 1% completed the Spanish-language survey. Of foreign-born men, 76% completed the English-language survey, 19% completed the Spanish-language survey, and the remaining 5% completed the survey in other languages. Foreign-born men surveyed in English or Spanish were less likely than U.S.-born men surveyed in English to be classified as gay-identified men who have sex with men (1% and 2% vs. 6%). Similar proportions of

Table 3. Age-Adjusted Weighted Percentages of Sexual Behaviors of Concordant and Discordant Identity–Behavior Groups*

Variable	Straight-Identified Men Who Have Sex with Women (n = 2511) (95% CI), %	Men Who Have Sex with Men (95% CI), %		
		Straight-Identified (n = 206)	Gay-Identified (n = 121)	Total (n = 337)†
Sexual partners in past 12 months				
1	77.5 (75.6–79.4)	95.6 (91.9–97.7)‡	51.9 (39.1–64.4)	83.3 (78.7–87.1)
2	8.0 (6.8–9.3)	2.3 (1.0–5.3)‡§	14.7 (8.9–23.4)	6.0 (3.9–9.1)
≥ 3	14.5 (13.0–16.1)	2.1 (0.8–5.2)‡§	33.4 (22.5–46.5)	10.7 (7.7–14.7)
History of STD	4.4 (3.5–5.4)	7.1 (3.8–12.8)§	19.7 (10.9–33.0)	10.4 (7.1–15.1)
Participants with 1 sexual partner	4.1 (3.2–5.3)	7.2 (3.8–13.4)§	12.6 (5.6–25.9)§	8.0 (4.7–13.3)
Participants with ≥ 2 sexual partners	6.8 (4.5–10.1)	11.8 (1.9–48.5)§	31.0 (23.2–40.1)	31.3 (24.2–39.5)
Condom use during last sexual encounter	35.6 (33.5–37.7)	22.0 (17.0–28.1)‡	55.0 (42.0–67.3)	31.7 (26.5–37.3)
Participants with 1 sexual partner	29.0 (26.7–31.4)	20.3 (15.2–26.5)‡	43.5 (31.0–56.9)	24.6 (19.4–30.6)
Participants with 2 sexual partners	58.4 (50.1–66.2)	100.0	88.7 (61.4–97.5)	90.0 (70.4–97.1)
Participants with ≥ 3 sexual partners	67.3 (60.7–73.3)	53.9 (44.6–62.8)	58.5 (44.8–71.0)	56.8 (44.0–68.8)
Had HIV test in past 12 months	22.5 (20.6–24.5)	25.4 (20.0–31.7)	35.1 (26.6–44.8)	29.1 (24.4–34.4)
Participants with 1 sexual partner	19.7 (17.7–21.9)	24.9 (19.3–31.4)	29.0 (19.1–41.4)	25.9 (20.8–31.7)
Participants with 2 sexual partners	24.7 (18.7–31.7)	71.1 (31.5–92.9)	56.7 (43.8–68.8)	62.4 (42.7–78.6)
Participants with ≥ 3 sexual partners	34.5 (28.2–41.4)	31.8 (8.5–70.0)§	45.8 (29.5–63.1)	41.7 (26.8–58.2)
Had risky behavior				
Yes	7.4 (6.3–8.8)	1.1 (0.3–4.5)‡§	13.9 (8.4–22.3)	5.0 (3.0–8.1)
No	92.6 (91.2–93.7)	98.9 (95.5–99.7)	86.1 (77.7–91.6)	95.0 (91.9–97.0)

* The weighted numbers are rounded to the nearest hundredth. They were 1 692 300, 175 300, 65 600, and 249 400 for straight-identified men who have sex with women, straight-identified men who have sex with men, gay-identified men who have sex with men, and the total number of men who have sex with men. STD = sexually transmitted disease.

† Includes straight-, gay-, and bisexual-identified men who have sex with men only.

‡ Statistically significant difference in prevalence estimate, comparing straight-identified and gay-identified men who have sex with men.

§ Unstable estimate.

|| Defined as 2 or more sexual partners in past 12 months and no condom use during last sexual encounter.

Table 4. Multivariate Logistic Regression Analysis of Factors Associated with Reported History for Testing for HIV Infection, Reported Condom Use during Last Sexual Encounter, Reported Risky Behavior, and Reported History of Sexually Transmitted Disease among Men Who Have Sex with Men Only*

Covariate	Adjusted Prevalence Ratio (95% CI) for HIV Test in Past 12 Months	Adjusted Prevalence Ratio (95% CI) for Condom Use during Last Sexual Encounter	Adjusted Prevalence Ratio (95% CI) for Risky Sexual Behavior†	Adjusted Prevalence Ratio (95% CI) for History of STD
Age				
18–24 y	4.5 (1.1–18.4)‡	3.4 (1.3–8.6)‡	0.8 (0.1–14.1)	1.8 (0.4–8.3)
25–44 y	3.1 (0.8–12.5)	1.6 (0.6–3.8)	2.6 (0.4–19.4)	0.9 (0.2–3.2)
45–64 y	1.4 (0.3–5.8)	1.2 (0.5–3.2)	2.1 (0.3–17.7)	0.9 (0.2–3.6)
≥65 y	1.0	1.0	1.0	1.0
Ethnicity				
Non-Hispanic white	1.2 (0.5–2.9)	Not included	2.1 (0.4–11.5)	0.7 (0.2–2.1)
Non-Hispanic black	2.5 (1.0–6.1)‡		0.1 (0.0–1.9)	1.1 (0.4–3.5)
Hispanic	2.8 (1.1–6.7)‡		1.1 (0.2–7.4)	0.8 (0.2–2.9)
Non-Hispanic other§	1.0		1.0	1.0
Sexual partners				
≥2	1.3 (0.9–1.9)	1.7 (1.2–2.4)‡	Not applicable	1.9 (0.9–4.2)
1	1.0	1.0		1.0
Sexual identity				
Straight-identified men who have sex with men	0.6 (0.4–0.9)‡	0.5 (0.3–1.0)‡	0.5 (0.2–0.9)‡	0.6 (0.3–1.2)
Gay-identified men who have sex with men	1.0	1.0	1.0	1.0

* STD = sexually transmitted disease.

† Risky behavior is defined as 2 or more sexual partners in the past year and no condom use during last sexual encounter.

‡ P ≤ 0.05.

§ Other race includes Asian, Native Hawaiian, Pacific Islander, Native American, Alaskan Native, multiple races, and other race.

foreign-born men surveyed in Spanish (7%), foreign-born men surveyed in English (8%), and U.S.-born men surveyed in English (7%) were classified as straight-identified men who have sex with men.

DISCUSSION

We believe our study describes the largest U.S. population-based survey to report concurrent measures of sexual identity and sexual health behaviors to date. Our findings show a considerable discordance between self-reported sexual behavior and self-reported sexual identity among men. Straight-identified men who have sex with men differed demographically and behaviorally from gay-identified men who have sex with men and were in some respects more similar to straight-identified men who have sex with women than to other men who have sex with men.

Although some discordance between sexual identity and sexual behavior is to be expected in any population and has been described in the context of nonrandom samples (13, 16, 18), our analysis suggests a larger discrepancy than has been noted previously in population-based studies. The Urban Men’s Health Study (UMHS) (25) included a large probability sample of men who have sex with men, of whom only 3% perceived themselves as heterosexual. The UMHS, however, included households in neighborhoods known to be predominantly gay and probably does not provide an accurate measure of sexual identity among all men from the general population who have

sex with men. Data from representative samples suggest that approximately 98% of men and women describe their sexual identity as heterosexual. The remaining 2% describe themselves as bisexual, homosexual, or undecided; however, substantially more than 2% report same-sex attraction, same-sex experience, or both (11). In their landmark population-based surveys of sexual behavior, Laumann and colleagues (12) found that although 9% of 18- to 59-year old men living in the largest U.S. cities identified as gay or bisexual in 1 study, a higher proportion of men (14.3%) surveyed in the same cities reported having male sexual partners in the past 5 years, 10.2% in the previous year. We report more marked differences using a single sample: In New York City, among sexually active men who also reported a sexual identity, 4% reported a gay identity but 12% reported same-sex sexual behavior in the past year. Despite the differences in phrasing of the question regarding sexual partners, the 2003 estimate of same-sex behavior in men was similar to that in the 2002 CHS.

We found that straight-identified men who have sex with men were much more likely than gay-identified men who have sex with men to report being foreign-born (43% vs. 15%). This led us to consider whether miscomprehension of survey questions could have resulted in misclassification of sexual identity. Foreign-born men who have sex with men, whether interviewed in English or Spanish, were less likely than U.S.-born men to identify as gay, suggesting that rather than misunderstanding the question regard-

ing identity, foreign-born men in New York City who have sex with men were reluctant to associate their behavior with a gay identity. Although reasons for discordance could not be ascertained in our survey, the interaction of identity and behavior is probably influenced by social and cultural factors. Foreign-born men who have sex with men may be subject to the social and cultural contexts of the countries in which they were born and thus may be reluctant to acknowledge homosexuality or tend to use a more narrow definition of what homosexuality constitutes. For example, the phenomenon of men who have sex with men but identify as heterosexual has been well-documented in Mexico (31) and in upper-class settings in Latin America (32). These straight-identified men who have sex with men, most of whom also have sex with women, will exchange sex with “gay” men and transvestites but only in the role of the insertive (anal or oral) partner. Of note, New York City has experienced a rapid growth in foreign-born population, which is expected to continue. In 2000, 36% of the population of New York City was born in countries other than the United States. Approximately one third emigrated from Latin America, and another one quarter emigrated from Asia (33).

There were several unexpected findings in our study. First, we found that 70% of straight-identified men who have sex with men reported that they were married, substantially more than the 54% of men who have sex with women who reported being married. Previous research, including that of Fay and colleagues (34) and Kinsey and colleagues (35), showed that a small percentage of married U.S. men had engaged in homosexual activities during the preceding year. In our sample, 10% of married men reported same-sex behavior during the preceding year. Some of these men, particularly those from socially conservative foreign countries, may have felt pressured to marry or to have children. It is not known how many of these straight-identified men who have sex with men reside with their spouses and engage in homosexual practices; these findings warrant further investigation.

Second, our analysis shows that straight-identified and gay-identified men who have sex with men are engaging in different patterns of sexual behavior: Gay-identified men who have sex with men report a higher average number of sexual partners, and the majority of straight-identified men who have sex with men (96%) report 1 sexual partner (a man) in the previous year. This contrasts with findings from a convenience sample of men in Denver, Colorado, who frequented venues for anonymous sex; that study found that married men who reported having sex with men reported more partners per month than gay-identified or bisexually-identified men (22).

Third, after we controlled for number of partners, straight-identified men who have sex with men were less likely than gay-identified men who have sex with men to have used condoms during their last sexual encounter and less likely to have been recently tested for HIV infection.

Other investigators (17) have found that non-gay-identified men who have sex with men (that is, straight-identified or bisexual-identified men who have sex with men) had similar rates of condom use and lower rates of testing for HIV infection compared with gay-identified men who have sex with men; however, differences in study frames and sampled populations make direct comparison difficult.

Our findings suggest that in the general population, straight-identified men who have sex with men, with fewer sexual partners on average, may consider themselves to be at lower risk for HIV infection and STDs. In fact, compared with men who have sex with men and report concurrent sexual partners or such activities as “bare backing” (intentional unprotected anal intercourse) or those with diagnoses of recurrent or concurrent STDs, straight-identified men who have sex with men may not play a substantial role in fueling the current STD and HIV epidemics among men who have sex with men. However, compared with men who have sex with women, the risk for acquiring infections may be elevated in straight-identified men who have sex with men, because their single male sexual partners may themselves have had multiple sex partners in the previous year. The male sexual partners of straight-identified men who have sex with men may be other straight-identified men who have sex with men or gay-identified men who have sex with men. In our survey, gay-identified men who have sex with men were found to exhibit risky behavior; 33% of gay-identified men who have sex with men reported having 3 or more sexual partners in the previous year, and 20% reported having a previous STD. Gay-identified men who have sex with men were also much more likely than straight-identified men who have sex with men to report both having 2 or more sexual partners and not using a condom during their last sexual encounter.

Our analysis has limitations. There are few data on the validity and reliability of sexual identity questions and the importance of how such questions are ordered within a survey. Sensitive items that are presented too early may lead to greater measurement error (36); it is possible that if identity were ascertained later, when a greater rapport had been established with the interviewer, more men who have sex with men would have self-identified as gay. However, an initial reluctance to self-identify as gay on an anonymous health survey may accurately reflect a propensity not to identify oneself as gay in other social or health care settings. Second, measures of sexual behavior may be affected by the manner in which the sex of sexual partners is ascertained and the placement of such questions in a survey. We ascertained the sex of partners by asking all survey participants first about male partners and then about female partners. It is possible that this unique method, in which men were asked about same-sex partners first and the accompanying definition of sex included vaginal intercourse, resulted in misunderstanding of the question and misclassification of heterosexual men as homosexual. It is possible that asking participants about opposite-sex sexual

partners first (that is, asking male participants about female sex partners first and asking female participants about male sex partners first) may change the proportion of men who report male partners, although such ordering may also be more likely to introduce a bias toward a socially desirable answer (36). Preliminary data from the 2005 CHS, which ascertained sex of partners by asking about opposite-sex partners first, suggest that doing so resulted in a much lower self-reported prevalence of men who report sex with other men (New York City Department of Health and Mental Hygiene, unpublished data). Additional study of different methods of ascertaining sex of partners will help to ensure accurate and reliable means of estimating same-sex behavior and may shed light on some of the large discrepancies we observed between behavior and identity.

The incidence of a previous STD may have been underestimated for all survey participants, but this may have been especially true for straight-identified men who have sex with men. Although primary care providers and sexual health centers serving a patient population predominantly of men who have sex with men are probably familiar with relevant national guidelines for STD screening, straight-identified men who have sex with men may be unlikely to obtain clinical services from such practices, particularly foreign-born men who may experience barriers to health care access. In the absence of a thorough sexual history including sex of partners and anatomic sites of sexual exposure (including the anorectum and oropharynx), providers, such as general practitioners caring for straight-identified men who have sex with men, may not recognize that their patients are at risk for STDs and HIV infection. Consequently, these providers may fail to offer appropriate screening or to attribute to sexual exposure infections that may be transmitted by other means (for example, such enteric pathogens as hepatitis A).

The CHS did not ask about unprotected anal intercourse, which could have been used to further elucidate risk. The question regarding condom use during the last sexual encounter is not a measure of the correct and consistent use of condoms that is required to effectively prevent transmission of HIV infection and STDs and therefore may have misclassified the risk of men's sexual behavior. Also, it is not known whether the men lived with their wives, information that could validate our surprising finding of the high proportion of straight-identified men who have sex with men who reported only 1 sexual partner—a man—in the year before the survey. The CHS is a comprehensive health survey rather than a focused sexual behavior survey, and survey length constraints did not permit inclusion of detailed questions on sexual behavior and living arrangements.

Finally, the CHS does not sample some groups that cannot be reached by using a basic telephone survey. Persons living in institutional settings and those in households without telephone service were excluded. Data are weighted to account for households without telephones;

however, neighborhood-specific estimates of such households are available only once every 10 years.

The 2005 New York City HIV/AIDS surveillance data show that 68% of incident cases of HIV infection in men with an identified risk factor occur in men who have sex with men (37). Data regarding sexual identity are not routinely available for persons with HIV infection in New York City; however, because sexual risk profiles in men seem to be associated with identity, insights could be gained from routine collection of these data. The observation that a few gay-identified men reported having sex with women in the past year indicates the need for longitudinal research to better understand how the social construct of sexual identity evolves on an individual level.

Gay-identified men who have sex with men in New York City were found to exhibit sexual behaviors that put them at higher risk than other men for HIV infection and STD acquisition, and public health prevention messages should continue to address the need for behavior modification to reduce risk in men who have sex with men. However, because men who have sex with men do not necessarily identify as gay, prevention messages should focus on the activities that pose risk (for example, unprotected receptive anal sex) and should not be framed to appeal solely to gay-identified men. Although most straight-identified men who have sex with men in New York City reported having sexual encounters with only 1 partner, it is likely that this does not eliminate risk, and it is troubling that a portion of this group seems to overlook key strategies for HIV and STD prevention. To ensure appropriate care and to reduce the burden of STDs and HIV infection among men who have sex with men, it is of utmost importance for providers to take a sexual history that ascertains the sex of partner or partners. Given our data, asking about a patient's sexual identity will not adequately assess his risk. Because there are different screening guidelines for men who have sex with men (38) and because certain STDs currently are appearing almost exclusively among men who have sex with men (6–9), a medical provider's knowledge that a male patient has sex with other men could result in a material change in clinical management. Such a change could contribute to improved diagnosis, prevention, education, and decision making about sexual health.

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Disclaimer: The findings and conclusions in this report are those of the authors and do not necessarily represent the views of the Centers for Disease Control and Prevention.

Acknowledgments: The authors thank Bonnie Kerker, PhD, Director, Community Epidemiology, Division of Epidemiology, New York City

Department of Health and Mental Hygiene, for providing the background and detailed review of survey procedures, and Lorna Thorpe, PhD, Deputy Director, Division of Epidemiology, New York City Department of Health and Mental Hygiene, and Stuart Berman, MD, Chief, Epidemiology and Surveillance Branch, Division of STD Prevention, Centers for Disease Control and Prevention, for their insightful reviews of the manuscript.

Grant Support: None.

Potential Financial Conflicts of Interest: None disclosed.

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