

# Persistence of Racial Differences in Attitudes Toward Homosexuality in the United States

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**Background:** Stigma may mediate some of the observed disparity in HIV infection rates between black and white men who have sex with men (MSM).

**Methods:** We used data from the General Social Survey to describe race-specific trends in the US population's attitude toward homosexuality, reporting of male same-sex sexual behavior, and behaviors that might mediate the relationship between stigma and HIV transmission among MSM.

**Results:** The proportion of blacks who indicated that homosexuality was "always wrong" was 72.3% in 2008, largely unchanged since the 1970s. In contrast, among white respondents, this figure declined from 70.8% in 1973 to 51.6% in 2008 with most change occurring since the early 1990s. Participants who knew a gay person were less likely to have negative attitudes toward homosexuality (relative risk, 0.60; 95% confidence interval, 0.52 to 0.69). Among MSM, twice as many black MSM reported that homosexuality is "always wrong" compared with white MSM (57.1% versus 26.8%,  $P = 0.003$ ). MSM with unfavorable attitudes toward homosexuality were less likely to report ever testing for HIV compared with MSM with more favorable attitudes (relative risk, 0.50; 95% confidence interval, 0.31 to 0.78).

**Conclusions:** US attitudes toward homosexuality are characterized by persistent racial differences, which may help explain disparities in HIV infection rates between black and white MSM.

**Key Words:** stigma, homosexuality, men who have sex with men, race, General Social Survey

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## INTRODUCTION

Despite the fact that men who have sex with men (MSM) comprise less than 5% of the male US population, 57% of all new HIV diagnoses in the United States occurred in MSM in 2007.<sup>1–3</sup> Among MSM, HIV disproportionately affects blacks. Blacks comprise approximately 13% of the total US population and nearly an identical proportion of MSM in the General Social Survey (GSS). However, in 2007, 24.5% of reported HIV cases among MSM occurred in blacks and some Centers for Disease Control and Prevention surveillance data suggest that HIV prevalence in black MSM may be more than twice that observed in white MSM.<sup>4</sup> The reasons for this disparity are unclear. Black MSM do not clearly have higher levels of sexual risk behavior than white MSM.<sup>5,6</sup> However, black MSM tend to preferentially choose other black partners<sup>7,8</sup> and, compared with HIV-infected white MSM, HIV-infected black MSM are diagnosed later in the course of infection and less frequently initiate antiretroviral therapy.<sup>4,9,10</sup> Because knowing one's HIV status leads to substantial changes in sexual risk behavior and antiretroviral treatment probably decreases the risk of transmitting HIV, these factors may partially explain the relatively high rates of HIV transmission among black MSM.

The underlying social factors that may promote the observed racial disparities among MSM remain ill-defined, but stigma toward same-sex behavior has been proposed as one explanation.<sup>11–14</sup> This stigma manifests as sexual prejudice<sup>15</sup> from the larger heterosexual population as well as a person's own incorporation of society's negative views toward homosexuality (internalized homophobia<sup>16,17</sup>). Previous population-based research showed declines in negative opinions about homosexuality in the 1990s.<sup>18</sup> Studies also found that blacks tended to have less favorable attitudes toward homosexuality than white respondents and that the gap between black and white populations diverged in the 1990s.<sup>18,19</sup> Several of these studies used the GSS, a repeated cross-sectional survey of US households that has included a question about attitudes toward homosexuality since 1973.

We analyzed the GSS using contemporary data (through 2008) to describe trends and correlates of attitudes regarding homosexuality. In addition, the GSS provides one of the only relatively large population-based samples of MSM; thus, we also explored trends in the reporting of male homosexual behavior. Because of the increasing racial disparities in HIV among MSM, we were specifically interested in how attitudes might vary by race and in identifying behaviors that might mediate the relationship between stigma and HIV transmission.

## METHODS

### Data

The GSS is a nationally representative, door-to-door survey of the demographics, attitudes, and behaviors of US adults.<sup>20</sup> Conducted annually or semiannually since 1972, the GSS consists of a household-based probability sample of individuals aged 18 years and older. The average response rate<sup>21</sup> has been 76% (range, 70.0% to 82.4%) since its inception. Each survey includes permanent items asked of all participants each year, supplemental items asked to all participants for only 1 year, and rotating items that appear every year but only to a random subset of surveys. The majority of the survey is interviewer-administered, although the rotating sexual behavior module is a self-administered questionnaire. Historically, the self-administered questionnaire used a pencil-and-paper format but has been computer-administered since 2002.

### Measures

In most survey cycles, the GSS has included a question about the respondent's attitude toward homosexuality: "What about sexual relations between two adults of the same sex—do you think it is always wrong, almost always wrong, wrong only sometimes, or not wrong at all?" Unless otherwise indicated, for this analysis, we coded the variable as "always wrong" versus not "always wrong."<sup>19</sup> (Combining "almost always wrong" with "always wrong" did not appreciably change the study findings.)

Until 2000, a respondent's race was coded as white, black, or other based on the interviewer's observation. If the interviewer was unsure, respondents identified their own race. Subsequent surveys asked all respondents to self-identify their race and included a separate question about Hispanic ethnicity.

Since 1989, a subsample of GSS respondents answered two questions that identify MSM, including the gender of sex partners in the last 12 months and the number of male sex partners since age 18 years. Starting in 1991, the GSS included a question about the gender of sex partners in the last 5 years. (The GSS does not distinguish between oral and anal sex partners.) Unless otherwise noted, we defined MSM using the 5-year variable because it is likely a more specific measure of male homosexuality than any male partner since age 18 years. The 5-year measure is also more sensitive and provides more analytical power than the measure that captures MSM behavior in the past year. Nevertheless, the three measures were relatively interchangeable and provided comparable results.

The GSS asked a subset of participants in 2006 about the number of the respondent's acquaintances in various settings who are "gay men or women," eg, general acquaintances, relatives, neighbors, coworkers, or members of volunteer associations. We coded any response greater than 0 as being indicative of knowing someone who is gay. To explore the association between sexual risk behavior and attitudes toward homosexuality among MSM, we used a question from the 2006 and 2008 surveys that asked if the respondent had ever been tested for HIV.

Finally, to assess the independent association between race and attitudes toward homosexuality, we conducted

multivariate analyses adjusted for year of survey and demographic variables that have been consistent across all GSS surveys: gender, age, marital status, education, religion, family income (adjusted to 2000 dollars), region of the United States, and size of the community.

### Analysis

We could not identify Hispanic ethnicity before 2000; thus, our analyses only included results for respondents who are coded as white or black regardless of ethnicity. To explore the overall prevalence and temporal trends in attitudes toward homosexuality, we calculated overall, year-specific, and race-specific proportions and 95% confidence intervals (CIs). We also conducted univariate and multivariate analyses to identify independent correlates of unfavorable attitudes. Given the changes in attitudes over time, we included an indicator variable for each survey year in the multivariate model. Because the outcome is common, we used Poisson regression with a log link to produce unbiased estimates of the risk ratios. We explored other correlates of attitudes toward homosexuality using chi-square tests.

We hypothesized that the temporal trend toward greater acceptance of homosexuality might be most pronounced among the youngest persons, reflecting different initial perspectives formed during adolescence, and that recent birth cohorts would reflect more marked changes in attitude with aging. We conducted exploratory analyses to test for interactions between age and year of interview, and between birth cohort and year of interview, on attitudes toward homosexuality. We used likelihood ratio tests to assess whether the inclusion of each set of interaction terms was statistically significant in the multivariate Poisson model.

We also estimated the prevalence of same-sex sexual behavior among male respondents and explored correlates of MSM behavior using univariate and multivariate logistic regression and chi-square tests.

Although the GSS uses a full probability sample of US households, we used weights to account for subsampling of nonrespondents, the oversampling of blacks, and household size. All analyses were conducted using Intercooled Stata 9.2 (College Station, TX).

## RESULTS

### Overall Prevalence and Correlates of Unfavorable Attitudes Toward Homosexuality

Since 1972, there have been a total of 27 GSS cycles and 53,043 respondents. Consistent with demographic changes in the United States, over time, GSS participants were increasingly nonwhite, never married, college-educated, non-religious, from the South and Mountain West, and from suburban or exurban areas (see **Table, Supplemental Digital Content 1**, <http://links.lww.com/QAI/A87>). We excluded 2406 (4.5%) participants who reported that their race was not white or black. The survey has asked a question about attitudes toward homosexuality to a subset of participants in all but five of the surveys. Thus, the final data set for this analysis included 30,837 respondents. Combining all surveys, 68.0%

(95% CI, 67.5% to 68.6%) of participants reported that homosexuality was “always wrong.”

On multivariate analysis (Table 1), the belief that homosexuality is “always wrong” was significantly associated with black race; male gender; older age; being married,

divorced, separated, or widowed (versus never married); lower educational attainment; lower income; living in the South, Midwest, or Mountain West (versus Northeast); and not living in a city. Compared with Protestant affiliation, all other religions were associated with more favorable attitudes toward

**TABLE 1.** Univariate and Multivariate Correlates of Adults Reporting That Homosexuality Is ‘Always Wrong,’ General Social Survey, 1973–2008 (n = 30,837)

Variable	Unweighted Prevalence	Weighted Prevalence	Univariate RR	Multivariate RR*
	% (95% CI)	% (95% CI)	RR (95% CI)	RR (95% CI)
<b>Race</b>				
White	65.8 (65.2–66.4)	66.5 (65.9–67.2)	1.00	1.00
Black	78.7 (77.5–79.9)	78.7 (77.3–80.0)	1.18 (1.16–1.21)	1.15 (1.12–1.18)
<b>Gender</b>				
Female	67.0 (66.3–67.7)	66.7 (65.9–67.5)	1.00	1.00
Male	68.5 (67.8–69.3)	69.6 (68.8–70.4)	1.04 (1.03–1.06)	1.10 (1.09–1.12)
<b>Age</b>				
18–24	58.3 (56.6–60.0)	59.0 (57.2–60.9)	1.00	1.00
25–34	60.1 (58.9–61.2)	60.5 (59.2–61.8)	1.02 (0.99–1.06)	1.00 (0.96–1.04)
35–44	63.8 (62.6–65.0)	64.9 (63.6–66.1)	1.10 (1.06–1.14)	1.05 (1.01–1.10)
45–54	66.2 (64.9–67.5)	68.1 (66.7–69.5)	1.15 (1.11–1.20)	1.07 (1.03–1.12)
55–64	74.1 (72.7–75.4)	75.5 (74.0–76.9)	1.28 (1.23–1.33)	1.12 (1.08–1.17)
65+	83.3 (82.3–84.2)	83.5 (82.4–84.6)	1.41 (1.37–1.46)	1.19 (1.15–1.24)
<b>Marital status</b>				
Never married	52.3 (51.1–53.5)	53.9 (52.5–55.4)	1.00	1.00
Separated/divorced	62.7 (61.4–64.1)	62.5 (60.9–64.0)	1.16 (1.12–1.20)	1.07 (1.03–1.11)
Married	72.0 (71.3–72.7)	72.1 (71.3–72.8)	1.34 (1.30–1.38)	1.21 (1.17–1.25)
Widowed	82.2 (80.9–83.5)	81.6 (80.0–83.1)	1.51 (1.46–1.56)	1.18 (1.13–1.23)
<b>Education</b>				
Less than high school	83.6 (82.8–84.4)	83.1 (82.2–84.1)	1.00	1.00
High school diploma	69.0 (68.3–69.7)	69.4 (68.7–70.2)	0.84 (0.82–0.85)	0.93 (0.91–0.95)
College degree (4-year)	45.8 (44.6–47.0)	46.8 (45.5–48.1)	0.56 (0.55–0.58)	0.67 (0.65–0.70)
<b>Religion</b>				
Protestant	76.2 (75.6–76.8)	76.7 (76.0–77.3)	1.00	1.00
Catholic	63.0 (61.8–64.1)	63.2 (61.9–64.4)	0.82 (0.81–0.84)	0.91 (0.89–0.93)
Jewish	28.7 (25.1–32.3)	28.0 (24.3–32.1)	0.37 (0.32–0.42)	0.43 (0.37–0.51)
None	35.7 (34.0–37.5)	36.4 (34.5–38.4)	0.48 (0.45–0.50)	0.56 (0.53–0.59)
Other	53.9 (50.5–57.3)	56.3 (52.5–59.9)	0.73 (0.69–0.78)	0.87 (0.81–0.93)
<b>Family income (adjusted to 2000 dollars)</b>				
Less than \$25,000	73.3 (72.4–74.2)	73.4 (72.4–74.3)	1.00	1.00
\$25,000–49,999	68.2 (67.3–69.2)	70.1 (69.1–71.1)	0.96 (0.94–0.97)	1.01 (0.99–1.03)
\$50,000+	58.5 (57.5–59.5)	60.2 (59.1–61.3)	0.82 (0.80–0.84)	0.94 (0.92–0.97)
<b>Region of United States</b>				
Northeast	57.9 (56.6–59.1)	57.9 (56.5–59.3)	1.00	1.00
Midwest	69.2 (68.2–70.1)	69.5 (68.4–70.6)	1.20 (1.17–1.23)	1.12 (1.09–1.16)
South	77.2 (76.4–77.9)	77.6 (76.8–78.5)	1.34 (1.31–1.38)	1.21 (1.18–1.25)
Mountain West	62.8 (60.6–65.1)	64.6 (62.2–67.0)	1.12 (1.07–1.17)	1.13 (1.08–1.18)
Pacific	54.9 (53.3–56.4)	55.9 (54.1–57.6)	0.96 (0.93–1.00)	1.02 (0.98–1.06)
<b>Size of city</b>				
City	61.7 (60.7–62.7)	61.8 (60.8–63.0)	1.00	1.00
Suburb (incorporated)	62.8 (61.8–63.8)	63.2 (62.2–64.3)	1.02 (1.00–1.05)	1.05 (1.03–1.08)
Exurb (unincorporated)	69.7 (68.2–71.1)	70.0 (68.4–71.5)	1.13 (1.10–1.16)	1.08 (1.05–1.12)
Small city/town	74.7 (73.3–76.0)	74.8 (73.3–76.3)	1.21 (1.18–1.24)	1.10 (1.07–1.13)
Rural or open area	81.9 (80.8–83.0)	81.8 (80.5–83.0)	1.32 (1.29–1.35)	1.13 (1.11–1.16)

\*The multivariate model adjusted for survey year and included all variables listed in Table 1. RR, relative risk; CI, confidence interval.

homosexuality with the strongest associations among Jewish participants and those with no religious affiliation. Further adjustment by Protestant denomination (Baptist, Methodist, Lutheran, Presbyterian, Episcopal, other, none) did not result in a meaningful change in the estimates, although we were not able to further refine these categories (eg, Evangelical or not). Including strength of religious affiliation resulted in a slight attenuation of the association between black race and reporting that homosexuality is “always wrong” (relative risk, 1.11; 95% CI, 1.08 to 1.14). There was no significant change in the proportion of respondents who were black between 1998 and 2000, the year that the GSS began asking participants to identify their own race. However, the adjusted association between black race and unfavorable attitudes toward homosexuality was stronger in 2000 to 2008 (relative risk, 1.28; 95% CI, 1.21 to 1.36) than before 2000 (relative risk, 1.11; 95% CI, 1.09 to 1.14) ( $P$  for interaction  $< 0.001$ ).

Using data available only in 2006, we found that knowing someone who is gay was strongly associated with more accepting attitudes toward homosexuality. Overall, 54.9% (95% CI, 51.6% to 58.2%) of respondents reported knowing someone who is gay. This proportion was somewhat lower among black compared with white respondents, although this difference was not significant ( $P = 0.09$ ). In univariate analysis, knowing a gay person was significantly less likely among the oldest participants and more likely among women and respondents with more than a high school education, no religious affiliation, or income \$50,000 or greater (Table 2). Respondents who reported knowing a gay person were significantly less likely to indicate that homosexuality was “always wrong” compared with those who did not (relative risk, 0.60; 95% CI, 0.52 to 0.69). Although blacks who reported knowing someone who is gay were less likely to report unfavorable attitudes toward homosexuality (relative risk, 0.85; 95% CI, 0.69 to 1.04), this effect was stronger among white participants (relative risk, 0.56; 95% CI, 0.47 to 0.66) ( $P$  for interaction = 0.002).

### Temporal Trends in Unfavorable Attitudes Toward Homosexuality

The question about attitudes toward homosexuality was first asked in 1973, at which time 72.5% (95% CI, 69.9% to 74.9%) of respondents indicated that homosexuality was “always wrong.” This proportion increased through the 1970s and 1980s, peaked in 1988 at 77.8% (95% CI, 74.7% to 80.5%), and declined rapidly to 61.0% (95% CI, 58.5% to 63.5%) in 1996. The estimate continued to decline slightly into the early 2000s and has remained relatively stable through 2008 at 54.7% (95% CI, 51.9% to 57.4%).

To assess if age at interview and birth cohort modified the observed calendar year trends, we constructed two multivariate models that included all demographic variables listed in Table 1 as well as the interaction between age at interview and 5-year survey intervals and the interaction between 10-year birth cohort and 5-year survey intervals. The interaction between age and calendar year was not significant ( $P = 0.131$ ), suggesting that the association between more accepting attitudes to homosexuality associated with youth were stable over time, although the differences between age

groups were less pronounced in the 1980s when the negative attitudes among all age groups increased. The interaction between birth cohort and calendar year was also nonsignificant ( $P = 0.706$ ). There were slight decreases in negative attitudes toward homosexuality in all birth cohorts between the 1980s and 2000s, but there were no meaningful differences in the magnitude of those changes between cohorts over time.

### Nonuniformity in Temporal Trends in Attitudes Toward Homosexuality

In contrast to the experience of white respondents, the proportion of blacks who indicated that homosexuality was “always wrong” decreased relatively little between the early 1970s and 2008 (Fig. 1). For example, among blacks, 84.2% (95% CI, 77.8% to 89.0%) reported that homosexuality is always wrong in 1973 and 72.3% (95% CI, 65.2% to 78.5%) reported this in 2008, a 14% decline. In contrast, among white respondents, the proportion that disapproved of homosexuality declined from 70.8% (95% CI, 68.0% to 73.4%) to 51.7% (95% CI, 48.7% to 54.7%) between 1973 and 2008, a 27% drop. The observed racial differences in attitudes toward homosexuality diverged dramatically in the 1990s. In 1990, the gap between black and white respondents' attitudes was 6.6 percentage points. It increased to 25.3 in 2004 but has closed somewhat in the two most recent GSS cycles.

For comparison, we also plotted the response that homosexuality is “not wrong at all” for each year (Fig. 1). The trends roughly correspond to the inverse of the response that homosexuality is “always wrong.” After nearly two decades of little difference in the proportion (10% to 20%) of white and black respondents reporting that homosexuality is “not wrong at all,” in 2008, this estimate increased only slightly among blacks to 21.0% (95% CI, 15.6% to 27.7%) and more dramatically among white respondents to 37.6% (95% CI, 34.8% to 40.6%).

### Prevalence of Male Homosexual Behavior and Attitudes Toward Homosexuality Among Men Who Have Sex With Men

Between 1989 and 2008, 5.4% (95% CI, 4.9% to 5.9%) of male respondents reported a male sex partner since the age of 18 years, 3.9% (95% CI, 3.4% to 4.4%) in the past 5 years, and 3.2% (95% CI, 2.8% to 3.6%) in the past year. Since 2000, there has been an increase in the proportion of men reporting same-sex behavior since age 18 years but a slight decline in the proportion reporting this in the past 1 or 5 years (Fig. 2). There was no significant change in the proportion of men reporting MSM behavior between 2000 and 2002, which was the year that the GSS implemented a computer-based survey for sexual behavior questions. Black men were significantly more likely to have a male sex partner in the past year (4.4%) compared with white men (3.1%) ( $P = 0.037$ ), but there was no significant difference between racial groups in the probability of reporting a male partner in the past 5 years (4.9% versus 3.7%,  $P = 0.114$ ) or since age 18 years (6.6% versus 5.2%,  $P = 0.088$ ). In univariate analyses of men surveyed since 1989, no religious affiliation was associated with increased likelihood of being a MSM (in the past 5 years), whereas income \$50,000 or more, living in the southern United States, or living outside

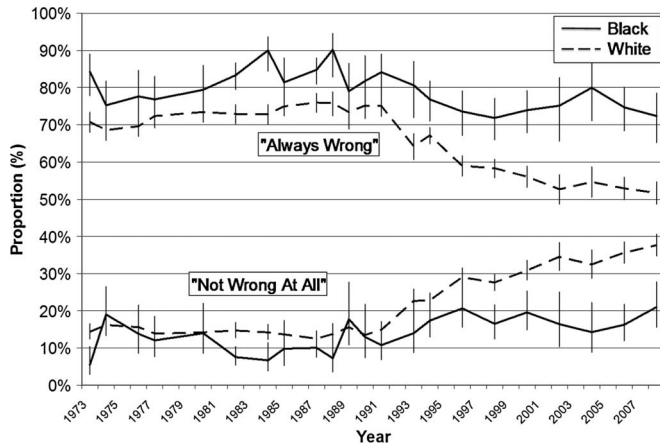
**TABLE 2.** Univariate and Multivariate Correlates of Knowing Someone Who Is Gay Among Adults, General Social Survey, 2006 Data Only (n = 1178)

Variable	Unweighted Prevalence	Weighted Prevalence	Univariate RR	Multivariate RR*
	% (95% CI)	% (95% CI)	RR (95% CI)	RR (95% CI)
<b>Race</b>				
White	56.8 (53.8–59.9)	56.0 (52.4–59.5)	1.00	1.00
Black	48.0 (40.5–55.5)	48.0 (39.5–56.6)	0.86 (0.71–1.04)	0.92 (0.75–1.14)
<b>Gender</b>				
Female	57.5 (53.8–61.3)	57.8 (53.5–62.0)	1.00	1.00
Male	52.7 (48.3–57.1)	51.2 (46.0–56.3)	0.89 (0.78–1.00)	0.88 (0.78–1.01)
<b>Age</b>				
18–24	64.4 (54.4–74.5)	58.8 (46.4–70.2)	1.00	1.00
25–34	61.4 (54.3–68.5)	57.8 (48.9–66.2)	0.98 (0.76–1.27)	0.99 (0.75–1.32)
35–44	64.0 (57.7–70.3)	64.1 (56.7–70.9)	1.09 (0.86–1.38)	1.09 (0.83–1.43)
45–54	55.3 (49.2–61.5)	56.2 (49.2–63.1)	0.96 (0.75–1.22)	0.95 (0.72–1.24)
55–64	59.0 (51.7–66.3)	56.2 (47.7–64.3)	0.96 (0.74–1.23)	0.97 (0.73–1.30)
65+	37.3 (31.2–43.4)	38.0 (31.3–45.3)	0.65 (0.49–0.85)	0.68 (0.48–0.96)
<b>Marital status</b>				
Never married	61.0 (55.2–66.8)	58.5 (51.1–65.6)	1.00	1.00
Separated/divorced	61.7 (55.3–68.2)	63.9 (56.2–71.0)	1.09 (0.92–1.29)	1.08 (0.89–1.32)
Married	52.8 (48.7–56.9)	52.8 (48.3–57.3)	0.90 (0.78–1.05)	0.90 (0.74–1.09)
Widowed	42.7 (33.3–52.1)	40.9 (30.6–52.1)	0.70 (0.52–0.94)	1.02 (0.73–1.42)
<b>Education</b>				
Less than high school	38.1 (30.5–45.7)	37.5 (29.1–46.7)	1.00	1.00
High school diploma	52.5 (48.7–56.3)	52.9 (48.5–57.2)	1.41 (1.10–1.81)	1.24 (0.97–1.57)
College degree (4-year)	69.0 (64.2–73.8)	66.8 (60.6–72.5)	1.78 (1.38–2.29)	1.51 (1.17–1.94)
<b>Religion</b>				
Protestant	53.0 (49.2–56.8)	52.5 (48.1–56.8)	1.00	1.00
Catholic	50.4 (44.1–56.7)	50.3 (43.0–57.5)	0.96 (0.81–1.13)	0.81 (0.67–0.97)
Jewish	75.0 (51.2–98.8)	68.4 (33.1–90.5)	1.30 (0.81–2.10)	0.88 (0.40–1.93)
None	66.3 (59.8–72.9)	65.9 (57.6–73.3)	1.26 (1.09–1.45)	1.06 (0.90–1.24)
Other	68.9 (54.8–83.0)	66.8 (49.4–80.5)	1.27 (0.99–1.64)	1.12 (0.87–1.44)
<b>Family income (adjusted to 2000 dollars)</b>				
Less than \$25,000	48.2 (42.9–53.6)	48.9 (42.7–55.0)	1.00	1.00
\$25,000–49,999	58.2 (52.7–63.7)	55.0 (48.6–61.2)	1.13 (0.95–1.34)	1.02 (0.86–1.21)
\$50,000+	62.8 (57.9–67.6)	60.2 (54.3–65.7)	1.23 (1.05–1.44)	1.07 (0.89–1.28)
<b>Region of United States</b>				
Northeast	59.3 (52.0–66.6)	56.6 (47.4–65.3)	1.00	1.00
Midwest	55.8 (50.2–61.5)	54.6 (48.0–60.9)	0.96 (0.79–1.18)	0.98 (0.79–1.21)
South	50.2 (45.5–54.9)	51.5 (46.2–56.8)	0.91 (0.75–1.10)	0.88 (0.71–1.10)
Mountain West	58.6 (49.5–67.7)	54.1 (43.9–64.0)	0.96 (0.75–1.22)	0.86 (0.65–1.13)
Pacific	64.1 (56.1–72.1)	64.3 (54.9–72.7)	1.14 (0.92–1.41)	1.04 (0.93–1.31)
<b>Size of city</b>				
City	54.9 (49.5–60.3)	53.7 (47.2–60.0)	1.00	1.00
Suburb (incorporated)	61.5 (56.4–66.5)	60.2 (54.1–66.0)	1.12 (0.96–1.31)	1.08 (0.93–1.26)
Exurb (unincorporated)	56.4 (49.5–63.3)	55.8 (47.9–63.5)	1.04 (0.86–1.25)	1.02 (0.84–1.23)
Small city/town	48.7 (39.3–58.0)	48.4 (38.1–58.8)	0.90 (0.70–1.15)	0.90 (0.69–1.18)
Rural or open area	48.0 (40.6–55.5)	48.8 (40.7–57.0)	0.91 (0.74–1.12)	0.96 (0.77–1.20)

\*The multivariate model adjusted for survey year and included all variables listed in Table 2. RR, relative risk; CI, confidence interval.

of a city was associated with not reporting MSM behavior (Table 3). After adjusting for all demographic variables and year of interview, only age 35 to 54 years (versus 18 to 24 years), lower income, and living in a city were associated with being a MSM in the past 5 years.

Among men interviewed between 1991 and 2008, nearly one third (30.5%; 95% CI, 24.0% to 38.0%) of MSM and 63.5% (95% CI, 62.1% to 65.0%) of non-MSM indicated that they believe that homosexuality is “always wrong.” Among MSM, attitudes toward homosexuality differed significant by



**FIGURE 1.** Proportion of adults who indicated that homosexuality is “always wrong” or “not wrong at all,” General Social Survey, 1973–2008. Solid lines, black respondents; dashed lines, white respondents.

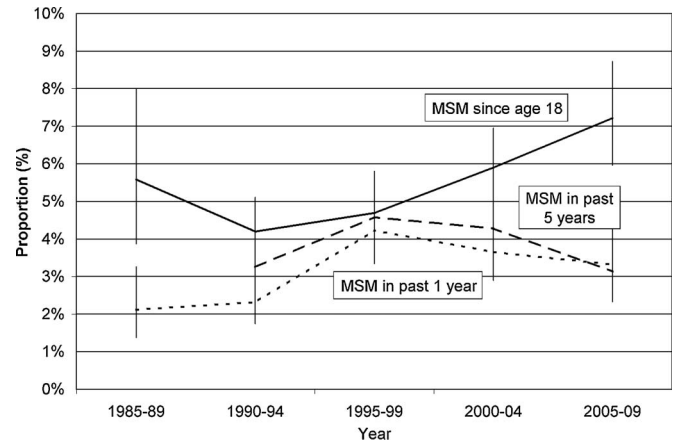
race with nearly twice as many black MSM reporting that homosexuality is “always wrong” compared with white MSM (57.1% versus 26.8%,  $P = 0.003$ ).

MSM who believed that homosexuality is “always wrong” were less likely to report ever testing for HIV (36.0%) compared with MSM who did not believe this (72.6%) (relative risk, 0.50; 95% CI, 0.31 to 0.78), and this association remained unchanged after adjustment for income and education. (For this analysis only, we defined MSM as same-sex behavior since age 18 years as a result of small cell sizes with the other measures. The other MSM measures showed a similar association.) Our analysis lacked sufficient power to look at this association by race.

## DISCUSSION

The proportion of US adults with more accepting attitudes toward homosexuality grew substantially over the last 35 years. After an increase in negative attitudes during the 1980s, the percentage of white and black GSS respondents who indicated that homosexuality is “always wrong” dropped by approximately 25 points. Nevertheless, the majority (55%) of the population continues to disapprove of homosexuality. Moreover, a profound gap in attitudes between white and black adults developed in the 1990s,<sup>18,19</sup> and our findings demonstrate that this difference, although no longer clearly growing, is now large and stable. We also observed that internalized homophobia was more common among black than white MSM and that MSM who reported that homosexuality was wrong were less likely to test for HIV. Furthermore, having a gay acquaintance was strongly associated with more accepting attitudes toward homosexuality, although the magnitude of that association was significantly smaller among blacks than among whites.

Our findings, along with prior research, suggest a possible, at least partial, explanation for the observed disparity in HIV between black and white MSM. Negative attitudes toward homosexuality at the population level may inhibit



**FIGURE 2.** Proportion of male adults reporting same-sex behavior; General Social Survey, 1989–2008 data only. Solid line, men who have sex with men (MSM) since age 18 years; long dashed lines, MSM in past 5 years; short dashed lines, MSM in past 1 year.

MSM from coming out. Because greater acceptance of homosexuality may be fostered by social interactions with gay individuals,<sup>22–24</sup> widespread disapproval of homosexuality, like that observed among blacks, is self-perpetuating. Insofar as this disapproval also promotes internalized homophobia among MSM themselves, it inhibits men from adopting behaviors, like HIV testing, that are likely to decrease HIV transmission at the population level.<sup>12,25–29</sup> The fact that MSM, like heterosexuals, preferentially choose sex partners of the same race<sup>7,8</sup> further magnifies the population-level impact of what might otherwise be relatively small differences in behavior.

Nevertheless, given the cross-sectional nature of each GSS survey, we cannot say that the associations we observed between knowing someone who is gay and less disapproval of homosexuality, and between internalized homophobia and decreased HIV testing, are causal. Although we observed an association between knowing someone who is gay and more approving attitudes toward homosexuality, this association was significantly weaker among blacks, highlighting that the increased visibility of sexual minorities alone is not likely to be sufficient to ameliorate this stigma. The GSS also did not begin collecting data on coming out until 2008, so there were too few data to explore the potential impact of attitudes toward homosexuality on disclosure of sexual orientation. Finally, we cannot rule out that the association between stigma and HIV testing may be confounded by access to health care, although this association was not attenuated after adjustment for income and education. (The GSS does not routinely ask about health insurance coverage.)

We did not observe an ongoing trend toward greater levels of homosexual behavior in the male population. Using earlier GSS data, Anderson and Stall reported that MSM behavior in the past year increased between 1996 and 2000.<sup>2</sup> Population data from the United Kingdom also demonstrated an increase in male same-sex behavior between 1990 and 2000.<sup>1</sup> We found that the proportion of men reporting same-sex sexual behavior since age 18 years increased steadily over

**TABLE 3.** Univariate and Multivariate Correlates of Reporting Same-Sex Sexual Behavior in the Past 5 Years Among Male Adults, General Social Survey, 1991–2008 Data Only (n = 7818)

Variable	Unweighted Prevalence	Weighted Prevalence	Univariate OR	Multivariate OR*
	% (95% CI)	% (95% CI)	OR (95% CI)	OR (95% CI)
<b>Race</b>				
White	4.2 (3.7–4.7)	3.7 (3.3–4.3)	1.00	1.00
Black	5.2 (3.8–6.7)	4.9 (3.6–6.6)	1.32 (0.93–1.87)	1.09 (0.74–1.62)
<b>Age</b>				
18–24	3.6 (2.2–4.9)	3.3 (2.2–4.9)	1.00	1.00
25–34	4.8 (3.8–5.8)	4.5 (3.5–5.7)	1.40 (0.85–2.29)	1.70 (0.97–2.96)
35–44	4.8 (3.9–5.8)	4.6 (3.7–5.7)	1.44 (0.89–2.32)	2.11 (1.23–3.63)
45–54	5.0 (3.9–6.1)	4.5 (3.5–5.8)	1.41 (0.86–2.32)	2.29 (1.32–3.98)
55–64	3.5 (2.4–4.7)	2.4 (1.7–3.5)	0.74 (0.43–1.29)	1.25 (0.68–2.31)
65+	2.8 (1.7–3.8)	2.3 (1.5–3.5)	0.70 (0.38–1.27)	1.02 (0.52–1.99)
<b>Education</b>				
Less than high school	3.3 (2.2–4.3)	3.4 (2.4–4.9)	1.00	1.00
High school diploma	4.2 (3.6–4.8)	3.9 (3.3–4.5)	1.13 (0.75–1.69)	1.20 (0.77–1.88)
College degree (4-year)	5.1 (4.3–6.0)	4.2 (3.4–5.1)	1.23 (0.81–1.87)	1.53 (0.94–2.49)
<b>Religion</b>				
Protestant	3.8 (3.2–4.4)	3.4 (2.9–4.0)	1.00	1.00
Catholic	4.0 (3.1–4.9)	3.9 (3.0–5.1)	1.14 (0.82–1.59)	1.03 (0.72–1.48)
Jewish	6.4 (2.7–10.0)	4.6 (2.2–9.2)	1.37 (0.64–2.93)	1.03 (0.49–2.19)
None	6.0 (4.8–7.3)	5.1 (4.0–6.5)	1.53 (1.13–2.09)	1.25 (0.88–1.76)
Other	5.0 (2.7–7.3)	4.5 (2.7–7.2)	1.33 (0.77–2.27)	1.08 (0.62–1.90)
<b>Family income (adjusted to 2000 dollars)</b>				
Less than \$25,000	5.8 (4.7–6.8)	5.3 (4.3–6.6)	1.00	1.00
\$25,000–49,999	5.1 (4.2–6.0)	4.4 (3.6–5.4)	0.82 (0.61–1.12)	0.74 (0.54–1.01)
\$50,000+	3.0 (2.4–3.6)	2.8 (2.2–3.5)	0.50 (0.36–0.69)	0.40 (0.28–0.57)
<b>Region of United States</b>				
Northeast	5.4 (4.2–6.6)	4.9 (3.8–6.3)	1.00	1.00
Midwest	3.9 (3.1–4.8)	3.7 (2.9–4.7)	0.75 (0.52–1.09)	0.70 (0.46–1.05)
South	3.7 (3.0–4.4)	3.3 (2.6–4.0)	0.66 (0.46–0.94)	0.66 (0.45–0.97)
Mountain	4.0 (2.3–5.6)	3.3 (2.1–5.2)	0.67 (0.39–1.15)	0.58 (0.33–1.02)
Pacific	5.7 (4.3–7.1)	4.7 (3.6–6.2)	0.97 (0.65–1.44)	0.92 (0.60–1.42)
<b>Size of city</b>				
City	7.0 (6.0–8.0)	6.0 (5.1–7.0)	1.00	1.00
Suburb (incorporated)	3.5 (2.9–4.2)	3.2 (2.6–4.0)	0.53 (0.40–0.70)	0.57 (0.41–0.78)
Exurb (unincorporated)	2.6 (1.5–3.6)	2.7 (1.6–4.6)	0.44 (0.25–0.79)	0.58 (0.32–1.04)
Small city/town	3.1 (2.0–4.2)	2.8 (1.9–4.1)	0.45 (0.29–0.70)	0.47 (0.29–0.74)
Rural or open area	2.5 (1.5–3.6)	2.7 (1.7–4.2)	0.43 (0.26–0.72)	0.55 (0.33–0.93)

\*The multivariate model adjusted for survey year and included all variables listed in Table 3. OR, odds ratio; CI, confidence interval.

the past 10 years, whereas the proportion reporting this in the past 1 and 5 years did not display this trend. Like other self-reported behaviors, it is difficult to know if these trends represent a true reflection of behavior in the population or are a function of more forthcoming reporting over time. This difficulty is exacerbated by the fact that the GSS changed from using a self-administered to computer-administered format in 2002, perhaps increasing reporting of stigmatized behaviors. The absence of a clear and sustained trend in MSM behavior in the prior 1 or 5 years in our analysis emphasizes the uncertainty of whether there is true trend toward greater homosexual behavior in the population, particularly given the very small number of MSM that participate in any individual wave of GSS or other population-based studies.

The primary strength of this study is the use of a frequent, population-based survey. The large annual sample size allowed us to explore trends within subgroups over 35 years. Nevertheless, our study has several limitations. First, our measure of attitudes toward homosexuality is based on a single question as opposed to a more comprehensive measure,<sup>30–32</sup> and many researchers have advocated for implicit, rather than explicit, measures for socially sensitive attitudes.<sup>33</sup> Our analysis also does not account for the finding that blacks are more likely than whites to report supporting laws prohibiting antigay discrimination.<sup>19</sup> Furthermore, the negative framing of the question may have led to an overestimate of negative attitudes toward homosexuality in the population. However, because the wording has remained

constant over time, the temporal trend patterns should be valid. Second, not all questions were asked in all surveys resulting in small cell sizes in some analyses. Most notably, the HIV testing question was only recently added to the GSS and there were too few observations to stratify these findings by race among MSM; thus, additional data are needed. Third, many respondents reported not knowing their specific religious denomination; thus, we were not able to adjust for liberal and conservative denominations. Fourth, the categorization of race was crude before 2000. Undoubtedly, there was misclassification as a result of the interviewer's presumption about the respondent's race. Finally, the primary aim of the GSS is to provide data on changing social attitudes; thus, the survey includes only a limited number of sexual behavior questions. Therefore, more definitive studies of attitudes toward homosexuality on HIV risk among MSM may need to use studies with larger numbers of MSM (eg, National HIV Behavioral Surveillance).

We acknowledge that this study cannot address with certainty if or how attitudes toward homosexuality in the general population affect HIV risk among MSM in general or black MSM in particular. However, our analysis provides a contemporary description of these attitudes in the US population and suggests at least one plausible causal pathway for how attitudes toward homosexuality might result in the dramatic racial disparities in HIV rates observed in US MSM. Given the tragic persistence of a profound HIV epidemic in MSM and the paucity of effective interventions to control that epidemic, we believe that attempting to alleviate the stigma associated with homosexuality should be considered as HIV prevention interventions. Our finding that acquaintanceship with someone who is gay is associated with decreased homophobia suggests that increasing the visibility of MSM may be an effective way to diminish homophobia, although this requires additional study. Beyond this, our observations suggest a need for ongoing surveillance related to homophobia, better research on how sexual prejudice influences sexual risk and health, intervention studies to define if and how public health efforts can diminish homophobia at the population level, and what impact such efforts might have on the health of MSM.

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