

Homonegative Attitudes and Risk Behaviors for HIV and Other Sexually Transmitted Infections Among Sexually Active Men in the United States

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Men in the United States are at increased risk for HIV and many other sexually transmitted infections (HIV/STIs). They acquired 80% of the estimated 47 500 incident HIV infections that occurred in 2010¹ and 91% of the 15 667 primary and secondary syphilis diagnoses that occurred in 2012.² However, men of different sexual orientations are differentially affected by these infections. Men who have sex with men (MSM) and men who have sex with men and women (MSMW) accounted for the majority of incident HIV infections and primary and secondary syphilis diagnoses (78% and 83%, respectively) that occurred among all men in these years. Similar disparities exist for other STIs.² Moreover, HIV incidence and syphilis incidence are increasing among MSM and MSMW and, especially, among younger men.³ These data warrant better understanding of factors conducive to HIV/STI risk among men, particularly those who have male sex partners.

One risk-related factor is homonegativity, which refers to negative attitudes toward homosexuality. (When referring to attitudes, researchers often prefer homonegativity to other words connoting sexual prejudice, such as homophobia [the irrational fear of homosexuality] or heterosexism [the social system that oppresses sexual minorities].^{4,5}) Despite increasing acceptance of homosexuality⁶ and recent federal legislation to prohibit discrimination based on sexual orientation,⁷ negative sentiments toward homosexuality are prevalent in the United States. The most recently published nationally representative data indicated that in 2008, 55% of US adults and 31% of MSM reported believing that homosexuality was “always wrong.”⁶ Homonegative attitudes emerge within social contexts characterized by unjust treatment of sexual minorities and negative perceptions of homosexual behavior.⁴ For

Objectives. We examined associations between homonegative attitudes and HIV and other sexually transmitted infection (HIV/STI) risk behaviors among sexually active US men.

Methods. We used the 2006–2010 National Survey of Family Growth (n = 10 403) and multivariable logistic regression models to examine homonegative attitudes in relation to condom use, number of past-year sex partners, HIV/STI testing, and STI diagnoses.

Results. Among men who had sex with men, homonegative attitudes were associated with lower odds of condom use during anal sex with women (before the past year) and past-year STI testing. Among men who had sex with men and women, homonegative attitudes were associated with lower odds of condom use during vaginal sex and sex with men, having 4 or more partners, and HIV testing ever. Among men who had sex with women, homonegative attitudes were associated with lower odds of condom use during vaginal sex and sex with men (before the past year), HIV testing ever, and contracting herpes, human papillomavirus, or syphilis.

Conclusions. Homonegative attitudes may promote HIV/STI acquisition and transmission among sexually active men of all sexual orientations. Interventions should address homonegative attitudes in the United States. (*Am J Public Health.* 2015;105:2466–2472. doi:10.2105/AJPH.2015.302780)

example, as of June 2015, only 21 states and the District of Columbia prohibited housing discrimination based on sexual orientation.⁸ In addition, multiple sources have documented the institutionalization of ongoing workplace discrimination against sexual minorities.⁹

Because of this larger homonegative environment, MSM and MSMW sometimes have negative views toward their own same-sex sexual behaviors.¹⁰ This internalized homonegativity can result in dispositions and behaviors conducive to HIV/STI acquisition and transmission.^{6,10–13} Studies using combined subsamples of MSM and MSMW have identified internalized homonegativity in association with mental health problems,¹⁰ substance use conducive to sexual disinhibition,¹⁴ avoidance of HIV testing,⁶ and for young gay men, condomless receptive anal sex.¹² Although some researchers have challenged internalized

homonegativity’s present-day relevance in promoting sexual risk behavior,¹⁵ limitations of their study (e.g., inclusion of only 1 risk-related outcome)¹³ as well as the widespread nature of homonegativity⁶ suggest that it potentially shapes contexts of risk for MSM and MSMW.

However, the negative effects of homonegative attitudes are likely not limited to MSM and MSMW alone. Social constructionist theory posits that US men of all sexual orientations encounter masculinity norms that pressure them to engage in risky behaviors to avoid being perceived as gay or effeminate.¹⁶ Consequently, as some researchers have articulated for MSMW,¹⁷ homonegative attitudes may motivate men who have sex with women (MSW) to engage in sexual risk behaviors with women in attempts to convey their masculinity. Such behaviors are important because they can outwardly convey to others that MSW are

indeed heterosexual and dominant in sexual interactions with women.¹⁸ For example, because homonegative attitudes pressure MSW to display their heterosexual prowess,¹⁶ MSW may engage in condomless sex because it results in outcomes (e.g., pregnancy) that preclude others from believing that they are gay. Because homonegativity encourages men to distance themselves from things associated with homosexuality, MSW may perceive HIV as a “gay man’s disease” for which they are not at risk and do not need protection.¹⁸ Indeed, in relatively dated¹⁹ and more recent²⁰ analyses, homonegative attitudes have been associated with negative perceptions of condom use among young MSW. Other research has suggested that masculinity norms engender internalized homonegativity and, consequently, sexual risk behavior among gay men.²¹

In light of this research, we sought to examine homonegative attitudes in relation to HIV/STI risk among US men of all behavioral sexual orientations. Our approach is unique in many ways. Unlike other researchers,^{6,10–12,15} we examined sexual behaviors with both women and men. Second, because of behavioral differences among MSM, MSMW, and MSW,^{22,23} we examined men in each of these groups separately. Third, because studies examining homonegative attitudes have rarely published generalizable data,⁶ we used nationally representative data that have implications for understanding homonegativity at the population level. Fourth, unlike recent seminal studies,^{6,15} we used multivariate modeling to adjust for factors that potentially confound relationships between homonegative attitudes and HIV/STI risk. Finally, because homonegative attitudes may affect outcomes other than condomless sex alone,¹³ we examined multiple HIV/STI-related outcomes.

METHODS

Data came from the National Survey of Family Growth (NSFG). The NSFG provides a nationally representative probability-based sample of persons aged 15 to 45 years who live in households and includes an oversample of African Americans, Latinos, and teenagers.²⁴ The sampling frame consisted of 110 primary sampling units based on the 2000 US Census.

During June 2006 to June 2010, trained female interviewers collected most data via computer-assisted personal interviews. Participants reported sensitive information (e.g., sexual behavior) via audio computer-assisted self-interviews. For the present analysis, we used data from the 10 403 men who participated in the survey. Interviews of these men averaged 52 minutes in length, and the response rate was 75%. Participants received a \$40 or \$80 incentive to complete the survey.²⁴

For this analysis, we defined behavioral sexual orientation using participants’ reports regarding the gender(s) of their past-year sex partners. For the preceding year, MSM reported sex with men only, MSMW reported sex with both men and women, and MSW reported sex with women only.

Variables

Because individuals’ perceptions regarding the morality of homosexuality provide the basis for their expressions of homonegative attitudes,^{4,25,26} our independent variable assessed whether participants agreed with the following question: “Are sexual relations between two adults of the same sex alright?” Responses ranged from *strongly agree* to *strongly disagree* on a 5-point Likert scale. We created a dichotomous measure to distinguish men with homonegative attitudes (i.e., responses of *disagree* or *strongly disagree*) from those without homonegative attitudes (i.e., responses of *neither agree nor disagree*, *strongly agree*, or *agree*). Although researchers have not measured homonegativity using validated scales in samples including men of multiple sexual orientations, measures comparable to ours exist in validated scales specific to heterosexual²⁷ and gay²⁸ men as well as studies assessing HIV risk behavior at the population level.⁶

Dependent variables included multiple HIV/STI-related behaviors and outcomes. All participants reported whether they used condoms during their most recent vaginal and anal sex acts with women and their most recent oral or anal sex with men. Some MSM had ever had sex with women and some MSW had ever had sex with men, but not during the previous year. To account for these occurrences, our condom use measures denoted condom use that MSM and MSW had with women and men, respectively, before the past year. Participants

reported their total number of partners (female, male, or both) during the previous year. After considering the distribution in number of partners as well as the fact that MSMW inevitably had 2 or more partners, we noted that 48% of MSMW had 4 or more partners (data not shown). So that our measure would be comparable for MSM, MSMW, and MSW, we created a measure to denote whether men had 4 or more past-year partners.

Men also indicated whether they had ever tested for HIV and the date of their most recent HIV test, which we used to determine whether they had tested during the previous year. They indicated whether they tested during the previous year for STIs other than HIV. Finally, participants self-reported whether a medical provider had diagnosed them with chlamydia or gonorrhea during the previous year or whether they had ever been diagnosed with human papillomavirus (or genital warts), herpes, or syphilis.

For multivariate modeling, we controlled for variables that could potentially confound associations between homonegative attitudes and risk outcomes. Homonegative attitudes and some HIV/STI-related risk behaviors vary by age, race/ethnicity, and number of partners,^{6,29} and an increased number of partners might indicate more liberal attitudes toward sexuality, including same-sex behavior.³⁰ Therefore, we controlled for age, race/ethnicity, and number of past-year partners. The NSFG measured age using participants’ birthdates and race/ethnicity using participants’ self-reports of race (Black, White, or other) and Latino ethnicity.

Analyses

We began by stratifying the larger sample of 10 403 men by behavioral sexual orientation. Among MSM, MSMW, and MSW, we used the Rao-Scott χ^2 test to compare men with and without homonegative attitudes according to race/ethnicity. We used the *t* test to compare men according to age. Next, we used the Rao-Scott χ^2 test to compare men with and without homonegative attitudes according to condom use, number of past-year partners, HIV/STI testing, and self-reported STI diagnoses. Finally, we used binary logistic regression to model the odds of these outcomes as a function of homonegative attitudes. These models

controlled for age, number of partners, and race/ethnicity.

Adjusted odds ratios (AORs) and 95% confidence intervals (CIs) indicate estimated effect sizes and significance levels, respectively. In all analyses, sampling weights adjusted for selection probability, nonresponse, and noncoverage. Design weights adjusted for NSFG's stratified cluster design and were applied to produce robust estimates of standard errors. We present only weighted means, proportions, and odds ratios. All analyses were performed using SAS version 9.3 (SAS Institute, Cary, NC).

RESULTS

Of the 10 403 men who completed the survey, 8229 had been sexually active during the past year. Of these men, 202 were MSM, 71 were MSMW, and 7956 were MSW (weighted proportions = 1.9%, 0.6%, and 97.5%, respectively). The sample's mean age was 30.7 years. Of participants, 12% were Black, 19% were Latino, 62.0% were White, and 5.9% were of other race/ethnicity. Overall, 57.9% of the men expressed homonegative attitudes.

Table 1 presents cross-tabulations of homonegative attitudes with age and race/ethnicity. Among MSM, homonegative men were marginally younger than nonhomonegative men (25.9 vs 31.8 years; $P = .06$). Among MSMW, fewer homonegative men than nonhomonegative men were Latino (9.2% vs 29.7%;

$P < .01$). Among MSW, homonegative men were older than nonhomonegative men (31.1 vs 30.1 years; $P < .01$). Moreover, among MSW, a greater proportion of homonegative than nonhomonegative men were Black (16.7% vs 7.4%; $P < .01$) and Latino (21.4% vs 15.9%; $P < .01$), but a lower proportion of homonegative than nonhomonegative men were White (56.2% vs 70.6%; $P < .01$). Overall, MSM, MSMW, and MSW differed from each other in the likelihood of having homonegative attitudes (3.8% vs 38.4% vs 59.1%, respectively; $P < .01$; data not shown).

Table 2 displays cross-tabulations of homonegative attitudes with sexual risk behavior, HIV/STI testing, and STI diagnoses. Among MSM, for those who had female sex partners before the past year, homonegative attitudes were associated with having been less likely to use a condom during the last anal sex act with women (55.1% vs 71.1%; $P < .01$). Homonegative attitudes were also associated with being less likely to have tested for STIs other than HIV during the past year (12.2% vs 37.8%; $P < .01$).

Among MSMW, homonegative attitudes were associated with being less likely to use a condom during the most recent vaginal sex act (20.1% vs 40.1%; $P < .01$) and last sex act with men (15.6% vs 55.5%; $P < .01$). Homonegative attitudes were associated with being less likely to have had 4 or more past-year sex partners (25.2% vs 71.9%; $P < .01$) or ever been tested for HIV (70.7% vs 89.6%; $P < .01$).

Homonegative attitudes were also associated with being less likely to have tested for HIV (40.9% vs 65.4%; $P < .01$) and other STIs (26.9% vs 54.2%; $P < .01$) during the past year.

Among MSW, homonegative attitudes were associated with being less likely to have used a condom during the most recent vaginal sex act (32.9% vs 36.4%; $P = .03$). Moreover, among MSW who had male sex partners before the past year, homonegative attitudes were associated with being less likely to have used a condom during the most recent same-sex encounter (6.2% vs 19.2%; $P < .01$). Homonegative attitudes were associated with being less likely to have received a diagnosis of herpes, human papillomavirus, or syphilis (3.0% vs 6.0%; $P < .01$).

Table 3 displays AORs and 95% CIs for associations between homonegative attitudes and sexual risk behavior, HIV/STI testing, and STI diagnoses. Among MSM, homonegative attitudes were independently associated with decreased odds of condom use during their last anal sex act with women that occurred before the past year (AOR = 0.19; 95% CI = 0.04, 0.90). MSM with homonegative attitudes also had decreased odds of testing for STIs other than HIV during the past year compared with MSM who did not have homonegative attitudes (AOR = 0.12; 95% CI = 0.03, 0.56).

Among MSMW, homonegative attitudes were independently associated with decreased odds of condom use during the most recent vaginal

TABLE 1—Cross-Tabulations of Homonegative Attitudes With Age and Race/Ethnicity Among Sexually Active Men Aged 15–45 Years: 2006–2010 National Survey of Family Growth, United States

Characteristic	MSM (n = 202)			MSMW (n = 71)			MSW (n = 7956)		
	Not Homonegative	Homonegative	P	Not Homonegative	Homonegative	P	Not Homonegative	Homonegative	P
Age, y, mean	31.8	25.9	.06	27.6	26.3	.49	30.1	31.1	< .01
Race/ethnicity, weighted %									
Black	10.1	26.8 ^a	.15	16.6	25.8	.27	7.4	16.7	< .01
Latino	15.1	34.2 ^a	.3	29.7	9.2	< .01	15.9	21.4	< .01
White	62.2	39.0 ^a	.3	44.9	46.7	.86	70.6	56.2	< .01
Other	12.5	0.0	...	8.7	18.3 ^a	.08	6.1	5.6	.62

Note. MSM = men who have sex with men; MSMW = men who have sex with men and women; MSW = men who have sex with women. All cross-tabulations used the Rao-Scott χ^2 test. We used the *t* test to compare men by age. Numbers are unweighted; proportions and means are weighted.

^aPopulation estimate may be unstable because the relative standard error is $\geq 30\%$ of the estimate.

TABLE 2—Cross-Tabulations of Homonegative Attitudes With Sexual Risk Behavior, HIV/STI Testing, and STI Diagnoses Among Sexually Active Men Aged 15–45 Years, by Homonegative Attitudes: 2006–2010 National Survey of Family Growth, United States

Characteristic	MSM (n = 202)			MSMW (n = 71)			MSW (n = 7956)		
	Not Homonegative	Homonegative	P	Not Homonegative	Homonegative	P	Not Homonegative	Homonegative	P
Condom use with women, last sex, %									
Vaginal	56.5	66.5 ^a	.72	40.1	20.1	<.01	36.4	32.9	.03
Anal	71.1	55.1	<.01	16.3	20.4	.39	28.2	28.3	.96
Condom use with men, last sex, ^b %	41.5	57.5 ^a	.53	55.5	15.6	<.01	19.2	6.2	<.01
≥ 4 sex partners, past year, %	26.5	14.2 ^a	.37	71.9	25.2	<.01	8.4	7.6	.36
HIV testing, %									
Ever	87.7	68.6 ^a	.29	89.6	70.7	<.01	69.5	66.1	.1
Past year	45.7	43.4 ^a	.92	65.4	40.9	<.01	30.0	31.4	.57
STI test, past year, %	37.8	12.2 ^a	<.01	54.2	26.9	<.01	15.4	16.7	.4
STI diagnoses, %									
Chlamydia or gonorrhea, past year	3.5 ^a	4.1 ^a	.83	4.2 ^a	2.1 ^a	.51	0.8	1.2	.33
Herpes, HPV, or syphilis, ever	11.9	9.2 ^a	.8	11.9	19.4	.19	6.0	3.0	<.01

Note. HPV = human papillomavirus; MSM = men who have sex with men; MSMW = men who have sex with men and women; MSW = men who have sex with women; STI = sexually transmitted infection. All cross-tabulations used the Rao-Scott χ^2 test. Numbers are unweighted; proportions are weighted.

^aPopulation estimate may be unstable because the relative standard error is $\geq 30\%$ of the estimate.

^bCondom use at last sex with men did not differentiate between anal and oral sex.

sex act (AOR = 0.20; 95% CI = 0.05, 0.85) and last sex act with men (AOR = 0.21; 95% CI = 0.07, 0.65). MSMW with homonegative attitudes also had decreased odds of having 4 or more past-year sex partners (AOR = 0.07; 95% CI = 0.02, 0.21) and ever being tested for HIV (AOR = 0.27; 95% CI = 0.07, 0.99) compared with MSMW who did not have homonegative attitudes.

Among MSW, homonegative attitudes were independently associated with decreased odds of condom use during the most recent vaginal sex act (AOR = 0.86; 95% CI = 0.74, 0.99) and last sex act with men (AOR = 0.26; 95% CI = 0.10, 0.64). Compared with MSW who did not have homonegative attitudes, MSW with homonegative attitudes also had decreased odds of ever testing for HIV (AOR = 0.81; 95% CI = 0.66, 0.99) and ever being diagnosed with herpes, human papillomavirus, or syphilis (AOR = 0.45; 95% CI = 0.32, 0.65).

DISCUSSION

This study provides important knowledge regarding the relationship between homonegative attitudes and HIV/STI risk behaviors among men in the United States. One notable observation was that homonegative attitudes

were, more often than not, independently associated with decreased condom use. This pattern was most apparent for MSMW and MSW. (However, among MSW who did and did not express homonegative attitudes, condom use during vaginal sex was not substantially different [32.9% vs 36.4%, respectively], although it was statistically different.) For MSM and MSW, homonegative attitudes were associated with decreased condom use with female and male sex partners, respectively, whom they had before the past year. These data highlight the potential for homonegative attitudes to be salient correlates of condom use behaviors for both women and men, including those in men's not-so-recent sexual histories.

Although we were unable to examine the extent to which homonegative attitudes might be causally related to condomless sex, social science theory and other data provide insights that are worth consideration. From a social constructionist perspective, society pressures men to enact their masculinity through attitudes and behaviors indicating their dominance over women and perceivably gay men (i.e., homonegativity).¹⁶ To the extent that homonegative attitudes partly convey men's outward expressions of masculinity, men may

engage in condomless sex as they attempt to dominate sexual encounters, particularly with women.¹⁸ This might especially be true for MSMW and MSW who, because they have sex with women, more closely align with societal expectations regarding male gender and sexuality than MSM. Consequently, MSMW and MSW may be more vulnerable to homonegativity-related pressures to engage in condomless sex, which might explain why homonegative attitudes were associated with condomless sex with both female and male partners among MSMW and MSW. Despite the fact that relatively few MSM expressed homonegative attitudes (3.8%), our finding of decreased condom use during anal sex with women suggests that homonegative attitudes might similarly affect MSM, although perhaps not to the same degree. However, because some measures of condom use pertained to behaviors before the past year, alternative explanations might consider the potential for condomless sex to shape men's subsequent homonegative attitudes.

Homonegative attitudes appear to have implications for men's HIV/STI testing behaviors. For MSMW and MSM, respectively, homonegative attitudes were independently associated with decreased testing for HIV ever and testing for other

TABLE 3—Adjusted Odds Ratios Depicting the Association Between Homonegative Attitudes and Sexual Risk Behavior, HIV/STI Testing, and STI Diagnoses Among Sexually Active Men Aged 15–45 Years: 2006–2010 National Survey of Family Growth, United States

Characteristic	MSM (n = 202), AOR (95% CI)	MSMW (n = 71), AOR (95% CI)	MSW (n = 7956), AOR (95% CI)
Condom use with women, last sex			
Vaginal	2.07 (0.30, 14.44)	0.20 (0.05, 0.85)	0.86 (0.74, 0.99)
Anal	0.19 (0.04, 0.90)	0.89 (0.17, 4.62)	0.93 (0.74, 1.16)
Condom use with men, last sex ^a	1.53 (0.25, 9.38)	0.21 (0.07, 0.65)	0.26 (0.10, 0.64)
≥ 4 sex partners, past year	0.40 (0.05, 3.04)	0.07 (0.02, 0.21)	0.83 (0.64, 1.06)
HIV testing			
Ever	0.33 (0.05, 2.07)	0.27 (0.07, 0.99)	0.81 (0.66, 0.99)
Past year	0.69 (0.12, 3.95)	1.54 (0.44, 5.33)	0.95 (0.73, 1.22)
STI test, past year	0.12 (0.03, 0.56)	0.41 (0.15, 1.14)	0.99 (0.78, 1.25)
STI diagnoses			
Chlamydia or gonorrhea, past year	1.24 (0.17, 9.05)	0.26 (0.01, 4.72)	1.36 (0.66, 2.83)
Herpes, HPV, or syphilis, ever	1.44 (0.17, 11.86)	0.81 (0.31, 2.11)	0.45 (0.32, 0.65)

Note. AOR = adjusted odds ratio; CI = confidence interval; HPV = human papillomavirus; MSM = men who have sex with men; MSMW = men who have sex with men and women; MSW = men who have sex with women; STI = sexually transmitted infection. All AORs control for age, number of past-year sex partners, and race/ethnicity.

^aCondom use at last sex with men did not differentiate between anal and oral sex.

STIs in the past year. As others have articulated,⁶ homonegative attitudes may result in men who are living with HIV/STIs not being aware of their infections and, therefore, being at increased risk for transmitting HIV/STIs within their sexual networks. Such transmission might be of public health concern given the already high HIV/STI prevalence among MSM and MSMW^{31,32} and potential opportunities for male-to-female transmission (despite the limited number of HIV transmissions from MSMW to women¹⁷).

Although we lacked contextual data that might further explain the relationships we observed, recent studies have described how homonegative attitudes can result in men perceiving HIV as a “gay man’s disease” for which they are not at risk.^{18,20,33} Because HIV/STI testing often occurs in settings in which men have to disclose their sexual behaviors,³⁴ their homonegative attitudes may lead them to avoid testing for fear of their sexuality becoming known to others. For MSW, the relationship between homonegative attitudes and ever testing for HIV was suppressed and only became evident in multivariate analyses. This finding suggests that if age, number of past-year partners, and race/ethnicity were equally distributed among MSW with and without

homonegative attitudes, then we would expect MSW with homonegative attitudes to be less likely than those without homonegative attitudes to ever test for HIV.

Notwithstanding the importance of our findings on condom use and HIV/STI testing, we emphasize some caution in drawing conclusions regarding the relationship between homonegative attitudes and HIV/STI morbidity. For MSMW and MSM, homonegative attitudes were not associated with increased risk of reporting an STI diagnosis. In fact, MSMW with homonegative attitudes were less likely than those without homonegative attitudes to have had 4 or more past-year partners. For MSW, homonegative attitudes were independently associated with lower odds of ever being diagnosed with herpes, human papilloma virus, or syphilis. These data suggest that the degree to which decreased condom use contributes to increased risk for HIV/STIs is unclear for men with homonegative attitudes. The decreased number of sex partners for homonegative MSMW, for example, would imply that they have relatively fewer HIV/STI exposures and, therefore, may need diagnostic testing less than men without homonegative attitudes.

Limitations

This study has some limitations. First, although our independent variable tapped into the core of homonegative attitudes (i.e., negative perceptions of same-sex sexuality),^{4,25,26} the NSFG only included 1 measure of homonegativity. The use of a single homonegativity measure can be beneficial when studying HIV-related outcomes, particularly at a population level.⁶ However, the use of multiple items within validated scales might provide a more thorough understanding of the health effects of homonegative attitudes, especially for MSM and MSMW.^{11,12,14} Second, although risk behaviors are important for understanding factors that generally place men at risk for HIV/STI acquisition and transmission,³⁵ the NSFG did not include biologic markers of STI or HIV infection, and it included no measure of HIV positivity. Such measures would have been useful for understanding the extent to which men’s attitudes are associated with HIV/STI morbidity.

Third, our use of cross-sectional data limits our ability to make causal inferences regarding the relationship between homonegativity and the outcomes we examined. Finally, the relatively small subsamples of MSM and MSMW (202 and 71, respectively) restricted the amount of statistical adjustment that we were able to make in multivariate analyses, and it may have reduced the statistical power of these analyses. Future studies can benefit from the use of larger probability-based samples of MSM and MSMW, biologic markers of HIV/STI positivity, and prospective designs and analyses that examine the effects of homonegative attitudes over time.

Conclusions

Despite these limitations, this study provides knowledge that can be beneficial in addressing HIV/STIs among US men of all sexual orientations. HIV/STI prevention programs should seek to counteract homonegative attitudes in interventions for men. Some behavior-change interventions for MSM and MSMW promote discussions of homonegativity.^{36,37} However, the widespread nature of homonegative attitudes suggests that such efforts might need to be expanded for all men and adapted for MSW.

Although our investigation focused on men's own homonegative attitudes, these attitudes emerge within a larger social environment that censures same-sex relations and potentially has even greater impacts on health than men's attitudes alone.³⁸ Therefore, interventions that counteract community and societal homonegativity can be useful in promoting healthy social environments for all men and reducing homonegativity that MSM and MSMW sometimes internalize. One strategy might involve the use of mass-media social marketing to promote positive images of sexual minorities and their loved ones.³⁹ Because men often express homonegative attitudes as they attempt to assert their masculinity,¹⁶ tangential efforts that promote healthier definitions of masculinity could also be useful. Public health research and programmatic efforts that are sensitive to homonegativity may make important strides toward addressing the high HIV/STI burden among men, particularly those who have sex with men, in the United States. ■

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Note. The findings and conclusions in this article are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

Contributors

W. L. Jeffries IV conceptualized the study, completed most analyses, and led the writing of the article. O. D. Johnson assisted with study conceptualization and analyses, wrote parts of the article, and critically reviewed article drafts.

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Human Participant Protection

Institutional review boards at the University of Michigan and the National Center for Health Statistics, Centers for Disease Control and Prevention, approved all study protocols. Participants provided informed consent before participation.

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