

# Correlates of Sexual HIV Risk Among African American Men Who Have Sex With Men

Jeffrey A. Kelly, PhD, Janet S. St Lawrence, PhD, Sergey S. Tarima, PhD, Wayne J. DiFranceisco, MS, and Yuri A. Amirkhanian, PhD

**Objectives.** We examined correlates of condomless anal intercourse with nonmain sexual partners among African American men who have sex with men (MSM).

**Methods.** We recruited social networks composed of 445 Black MSM from 2012 to 2014 in Milwaukee, Wisconsin; Cleveland, Ohio; and Miami Beach, Florida. Participants reported past-3-month sexual behavior, substance use, and background, psychosocial, and HIV-related characteristics.

**Results.** Condomless anal intercourse outside main concordant partnerships, reported by 34.4% of MSM, was less likely in the case of no alcohol and marijuana use in the past 30 days, and higher risk-reduction behavioral intentions. High frequency of condomless anal intercourse acts with nonmain partners was associated with high gay community participation, weak risk-reduction intentions, safer sex not being perceived as a peer norm, low condom-use self-efficacy, and longer time since most recent HIV testing.

**Conclusions.** Condomless anal intercourse with nonmain partners among Black MSM was primarily associated with gay community participation, alcohol and marijuana use, and risk-reduction behavioral intentions. (*Am J Public Health.* 2016;106:96–102. doi: 10.2105/AJPH.2015.302945)

**H**IV infection in the United States falls along sharp lines of disparity related to sexual orientation and race. Every year since HIV surveillance began, men who have sex with men (MSM) have accounted for the majority of the country's HIV cases.<sup>1</sup> The disease also disproportionately affects African Americans, who constitute 12% of the American population but carry 44% of its HIV infection burden.<sup>1</sup> Yet, the starkest disparity emerges from the combined impact of race and sexual orientation. Black MSM represent only a fraction of a percent of the American population but accounted for more than 25% of the country's new HIV infections in 2010,<sup>1</sup> with HIV rates much higher among Black than White MSM.<sup>2</sup> HIV incidence among racial-minority MSM in some cities ranges from 24% to 29%.<sup>3,4</sup> Considerable attention is being given to biomedical strategies such as early initiation of antiretroviral therapy (ART) and preexposure ART prophylaxis for HIV prevention.<sup>5,6</sup> However, the impact of these promising strategies will depend upon ART coverage and adherence, neither of which is likely to be quickly attained or

complete. For this reason, integrated HIV prevention approaches are needed, including improved interventions to reduce risk behavior among racial-minority MSM.

Previous research has examined but has generally failed to establish differences in individual-level risk practices between Black and White MSM.<sup>7–10</sup> However, sexual network characteristics, high rates of undiagnosed and untreated HIV infection, high sexually transmitted infection (STI) prevalence, and unsuppressed viral load among HIV-positive African American MSM are believed to contribute to HIV disparities.<sup>9–16</sup>

Black MSM are not a monolithic population,<sup>17–20</sup> and multiple factors may influence extent of HIV vulnerability within the community of racial-minority MSM.

These include risk-related sexual behavior norms, attitudes, and intentions<sup>21–25</sup>; substance use<sup>12,26–30</sup>; poverty and disadvantage<sup>19,20</sup>; and psychosocial domains including internalized homonegativity or homophobia,<sup>31–34</sup> self-perceived masculinity,<sup>35,36</sup> HIV conspiracy beliefs or mistrust,<sup>37,38</sup> religiosity,<sup>39</sup> and resilience.<sup>40,41</sup> It is important to ascertain the relative importance of these and other factors to properly tailor HIV prevention interventions for racial-minority MSM.

In this study, we recruited social networks of African American MSM and sought to determine the relationships of 4 types of factors with the riskiness of men's sexual behavior practices: (1) social, economic, and demographic background characteristics; (2) substance use; (3) HIV risk-specific knowledge, attitudes, beliefs, and intentions; and (4) psychosocial domains including internalized homonegativity, self-ascribed masculinity, AIDS conspiracy beliefs, resilience, religiosity, and gay community participation. We examined HIV risk-specific characteristics because they are proximal to adopting protective actions according to many behavioral science theories.<sup>42–44</sup> We examined psychosocial domains because broader personal and contextual life experiences may also potentiate risk. We sought to identify characteristics related not only to some men's high-risk behavior but also the adoption of very safe behavior by other African American MSM, a strengths-based question that has been insufficiently explored.

## ABOUT THE AUTHORS

Jeffrey A. Kelly, Sergey S. Tarima, Wayne J. DiFranceisco, and Yuri A. Amirkhanian are with Center for AIDS Intervention Research, Department of Psychiatry and Behavioral Medicine, Medical College of Wisconsin, Milwaukee. Janet S. St Lawrence was with the College of Arts and Sciences, Mississippi State University, Meridian, when the study was conducted.

Correspondence should be sent to Jeffrey A. Kelly, PhD, Center for AIDS Intervention Research, Department of Psychiatry and Behavioral Medicine, Medical College of Wisconsin, 2071 N Summit Ave, Milwaukee, WI 53202 (e-mail: cairdirector@mcw.edu). Reprints can be ordered at <http://www.ajph.org> by clicking the "Reprints" link.

This article was accepted October 8, 2015.

doi: 10.2105/AJPH.2015.302945

## METHODS

We recruited social networks of racial-minority MSM in Milwaukee, Wisconsin; Cleveland, Ohio; and Miami Beach, Florida, in 2012 through 2014. Network recruitment began by identifying initial “seeds” in community venues where Black MSM were known to meet including bars, clubs, pageants, house balls, and neighborhood hangout places. Field staff systematically observed “social circles”<sup>45</sup> of racial minority men in these settings and identified each circle’s center of social attention. All seeds were Black MSM. Field staff approached the potential seed and explained the study. If recruited, the seed was asked to identify—by first name only—his close MSM friends. Seeds were asked to invite into the study each named friend. These individuals constituted the network’s first “ring.” When members of the first ring entered the study, they also invited their own personal friends, the second network ring. They, in turn, invited their own friends. In this way, sociocentric networks reached out 3 waves from each initial seed. Participant inclusion criteria were being aged at least 18 years, living in the study city, being named as a friend by an already-enrolled participant, and providing written informed consent. Networks were eligible for inclusion if at least 50% of the seed’s first-ring friends were enrolled.

We recruited 35 networks consisting of 464 participants (230, 180, and 54 from Milwaukee, Cleveland, and Miami Beach, respectively). Networks ranged in size from 3 to 47 (mean = 13) enrolled members. We excluded 19 men who reported their race as White, reported no history of same-sex behavior, or declined to answer sexual behavior questions. The sample size for analysis was 445.

### Interview Assessment Measures

Participants individually completed audio computer-assisted self-interviews and received risk-reduction counseling.

**Demographic characteristics.** Participants responded to questions about their gender at birth, self-identified present gender (male, female, or transgender), age, race, ethnicity, employment, income, education, and housing stability. Participants used

a 5-point scale to describe their sexual orientation (from exclusively gay to exclusively straight) and were asked whether they ever had an HIV test, whether it was in the past year, and the most recent test’s result.

**Sexual risk practices during lifetime, the past year, and the past 3 months.** Participants indicated their number of male and female sexual partners in the previous year. Participants then described their sexual behaviors over the past 3 months on a partner-by-partner basis for up to the most recent 5 male and 5 female sexual partners. Respondents indicated their relationship with each partner (main and committed, regular but not main and committed, casual, or commercial), how often in the past 3 months they had anal intercourse (AI) with each male partner, and how many of those acts were condomless AI (CLAI). For each partner, respondents reported whether they disclosed their HIV serostatus before intercourse and whether the partner did so. Participants with more than 5 partners of either gender in the past 3 months summarized their sexual practices with all additional partners.

We divided the sample into 2 groups on the basis of their sexual behavior. Men were considered to be low risk in their behavior ( $n = 292$ ) if they reported no CLAI during the past 3 months (either because they did not engage in any AI or reported 100% condom use for all AI acts), or if they reported CLAI only with their single main male partner when (1) both the respondent and that main partner had been tested, (2) the partner disclosed his HIV-positive or HIV-negative serostatus before sex, and (3) they were HIV seroconcordant. Men were considered to have engaged in high-risk acts ( $n = 153$ ) if they reported CLAI with partners other than their single seroconcordant main male partner in the past 3 months.

**Substance use.** Participants were asked on how many days they drank alcohol in the past month and their number of drinks in a typical drinking day. In addition, participants indicated whether, and on how many days in the past month, they used each of a series of listed drugs including heroin, other opiates, cocaine or crack, amphetamines or methamphetamines, marijuana, Ecstasy,

$\gamma$ -hydroxybutyrate, ketamine, inhaled nitrites (“poppers”), nonprescribed medications for erectile dysfunction, illicit prescription drugs, and any injected drug.

**HIV risk-specific scales.** The assessment included 5 HIV risk-specific scales. A 9-item scale measured knowledge of HIV risk-reduction steps (sample item: “If a man pulls out before orgasm, it protects from getting AIDS and venereal diseases.”; scale range = 0–9). An 8-item scale measured perceived condom use peer norms (sample item: “Condom use is well-accepted among my friends.”) with 3-point scales for each statement (scale range = 0–16; Cronbach  $\alpha$ , current sample = 0.75). We used the same response format to measure condom attitudes (8 items, sample item: “Using condoms interrupts the pleasure of sex.”; range = 0–16; Cronbach  $\alpha = 0.80$ ); risk reduction behavioral intentions (8 items, sample item: “A condom will be used if I have sexual intercourse with a casual partner.”; range = 0–16; Cronbach  $\alpha = 0.75$ ); and risk reduction self-efficacy (8 items, sample item: “I am sure that I can overcome my partner’s objections to condoms.”; range = 0–16; Cronbach  $\alpha = 0.66$ ).

**Psychosocial domains.** Five scales measured broader psychosocial domains hypothesized in the literature to influence HIV risk among minority MSM. We measured self-ascribed masculinity with a 4-item scale adapted from García et al.<sup>46</sup> (sample item: “I can pass as a straight man.”; 5-point Likert response options from strongly disagree to strongly agree, range = 4–20; Cronbach  $\alpha = 0.83$ ). We assessed internalized homonegativity by using a measure adapted from Herek et al.,<sup>33</sup> Myers,<sup>47</sup> and Wagner,<sup>48</sup> with 5-point Likert scales to indicate agreement with 9 statements (sample item: “I wish I were not sexually attracted to men.”; range = 9–45; Cronbach  $\alpha = 0.86$ ). We assessed resilience, the perceived internal capacity to handle challenging life situations, by using 10 items from a 25-item scale originally developed by Wagnild and Young<sup>49</sup> (sample item: “My belief in myself gets me through hard times.”; range = 10–50; Cronbach  $\alpha = 0.88$ ).

We measured AIDS conspiracy beliefs with Bogart and Thorburn’s<sup>37</sup> 9-item scale (sample item: “AIDS was created by

the government to control the Black population.”; 5-point Likert scales, range = 9–45; Cronbach  $\alpha$  = 0.89). We measured religiosity and church involvement with 6 items adapted from Forehand et al.<sup>50</sup> (sample item: “How often do you attend religious services?”; range = 6–30; Cronbach  $\alpha$  = 0.80). Finally, we developed a 7-item scale specifically for this research to measure gay community participation, the extent to which one actively participates in gay-identified community activities (sample item “How often do you visit gay clubs or Web sites?”; range = 7–35; Cronbach  $\alpha$  = 0.86).

### Statistical Methods

We first calculated means and standard errors for continuous variables and relative frequencies for categorical variables to characterize the overall sample. We performed bivariate and multivariable statistical analyses by using random effects models to account for the potential effect of social network. We first used single-predictor logistic regressions with a random network effect to investigate the statistical significance of differences between men who did or did not engage in any high-risk acts on individual variables. We then performed multiple logistic regressions with a random network effect to identify significant main effects by using forward stepwise variable selection. We investigated all variables that had achieved *P* values less than .2 in the bivariate analyses for statistical significance. We also tested all 2-way interactions between significant main effects for statistical significance.

Finally, we examined variables associated with reporting 3 or more high-risk CLAI acts with nonmain partners in the past 3 months. We used this cutoff because it categorizes participants as above the median (median = 2) or at or below the median. We used logistic regression analyses to compare the groups on the basis of their frequency of high-risk CLAI acts. We considered differences significant at the 5% significance level. Because of occasional small counts, we aggregated some categories into larger groups to secure at least 10 participants per cell after cross-tabulation with the risk-level indicator.

### RESULTS

Participants’ mean age was 27.3 years (SE = 1.04; range = 18–57). Although all reported being of male gender at birth and the large majority still identified as male (n = 408; 92%), 6% of participants (n = 28) now identified as transgender and 2% (n = 8) as female. Seventy-five percent (n = 335) described their sexual orientation as mainly or exclusively gay, 21% (n = 94) as bisexual,

and 3% (n = 15) as mainly or exclusively straight. Seven percent (n = 29) of participants reported being of Hispanic ethnicity. Nearly half (n = 199) of participants were unemployed, 76% (n = 334) had annual incomes below \$20 000 per year with 56% (n = 245) below \$10 000, and 55% (n = 246) had high-school or less education. Nine percent (n = 39) of participants reported unstable housing. Alcohol and marijuana were the

**TABLE 1—Characteristics of Black Men Who Have Sex With Men Reporting Any or No High-Risk Condomless Anal Intercourse (n = 445): Milwaukee, WI; Cleveland, OH; and Miami Beach, FL; 2012–2014**

Domain or Variable	High-Risk CLAI (n = 153), % (No.) or Mean $\pm$ SE	No High-Risk CLAI (n = 292), % (No.) or Mean $\pm$ SE	<i>P</i>
<b>Sociodemographic characteristics</b>			
Male gender <sup>a</sup>	92.8 (142)	91.1 (266)	.45
Age, y <sup>a</sup>	27.0 $\pm$ 1.12	27.5 $\pm$ 1.07	.41
Hispanic ethnicity	6.5 (10)	6.5 (19)	.95
Low education ( $\leq$ high school)	55.6 (85)	55.1 (161)	.97
Attends school	21.6 (33)	23.6 (69)	.54
Currently employed	49.7 (76)	58.2 (170)	.06
Low income (< \$10 000 annually) <sup>a,b</sup>	62.5 (95)	52.6 (150)	.03
Unstable housing situation	9.8 (15)	8.2 (24)	.65
<b>Sexual, STI, and HIV testing history</b>			
Completely gay orientation <sup>a</sup>	49.0 (75)	42.1 (123)	.22
Had main male partner > 1 y	21.6 (33)	25.3 (74)	.43
Had an STI in past 6 mo <sup>a</sup>	13.2 (20)	5.2 (15)	.01
Never tested for HIV or tested more than 1 y ago	39.2 (60)	35.6 (104)	.46
Was HIV+ at most recent test	30.7 (47)	19.9 (58)	.02
<b>Substance use in past 30 d</b>			
Drank alcohol	92.8 (142)	80.5 (235)	< .01
Smoked marijuana	71.9 (110)	53.4 (156)	< .01
Used crack or powder cocaine	16.3 (25)	5.8 (17)	< .01
Used any illicit drug (excluding alcohol or marijuana)	28.1 (43)	13.7 (40)	< .01
<b>HIV risk-specific scales</b>			
HIV risk knowledge	7.2 $\pm$ 0.14	7.0 $\pm$ 0.11	.17
Perceived condom-use peer norms <sup>a</sup>	10.4 $\pm$ 0.34	11.5 $\pm$ 0.29	< .01
Risk-reduction behavioral intentions <sup>a</sup>	10.1 $\pm$ 0.31	12.8 $\pm$ 0.26	< .01
Condom-use attitudes	12.0 $\pm$ 0.31	13.4 $\pm$ 0.26	< .01
Condom-use self-efficacy	13.0 $\pm$ 0.23	13.7 $\pm$ 0.18	< .01
<b>Psychosocial domain scales</b>			
Self-ascribed masculinity <sup>a</sup>	13.7 $\pm$ 0.36	13.7 $\pm$ 0.29	.99
Gay community participation	21.2 $\pm$ 0.55	20.0 $\pm$ 0.45	.05
Internalized homonegativity <sup>a</sup>	19.4 $\pm$ 0.67	19.8 $\pm$ 0.51	.56
Resilience <sup>a</sup>	43.6 $\pm$ 0.42	44.7 $\pm$ 0.31	.03
AIDS conspiracy beliefs <sup>a</sup>	18.9 $\pm$ 0.62	18.1 $\pm$ 0.47	.26
Religious and church involvement <sup>a</sup>	17.0 $\pm$ 0.48	17.9 $\pm$ 0.39	.06

Notes. CLAI = condomless anal intercourse; STI = sexually transmitted infection.

<sup>a</sup>Up to 4 participants were missing data on predictor variables.

<sup>b</sup>Eight individuals did not disclose their income.

substances most commonly used by study participants. Eighty-five percent (n = 377) of participants drank alcohol and did so on a mean of 8 days in the past month, and 60% (n = 266) smoked marijuana on an average of 17 days. Other substances used by more than 2% of participants in the past month were crack or cocaine (9%; n = 41), Ecstasy (7%; n = 31), illicit use of prescription drugs (19%; n = 83), opiates (4%; n = 18), and inhaled nitrites (3%; n = 14). Injection drug use in the past month was reported by only 2 participants. Because many individuals used illicit drugs but the number using a particular substance was often modest, substances other than alcohol and marijuana were combined into a category of any illicit drug use.

Participants reported a mean of 5.4 (SE = 0.66) male partners in the past year and 2.4 (SE = 0.23) in the past 3 months. Most men (93%; n = 415) had no female partners during these periods. Most participants (96%; n = 426) said they had been tested for HIV at some point, 66% (n = 281) in the past year, and 25% (n = 105) said their most recent HIV test was positive.

### Engaging or Not Engaging in High-Risk Acts

Table 1 shows results comparing participants who did or did not engage in high-risk acts. Men who engaged in high-risk CLAI were significantly more likely to have incomes less than \$10 000, to have had an STI in the past 6 months, to be HIV-positive, and tended to more often be unemployed. The groups significantly differed on all of substance use variables reported in Table 1, with substance use always greater among men who engaged in high-risk CLAI. There were consistent differences between groups on 4 of the 5 HIV risk-specific scales. Men reporting high-risk acts had weaker perceived peer norms for condom use, risk behavior reduction intentions, attitudes toward condoms, and self-efficacy for condom use. With respect to psychosocial domains, participants reporting high-risk CLAI scored higher in gay community participation and lower in resilience. Those who did not report high-risk CLAI tended to report greater religious and church involvement.

Results of the multiple mixed logistic regression analysis predicting whether participants reported high-risk acts in the past 3 months are shown in Table 2, with reported odds ratios (ORs) adjusted for significant covariates. Four variables remained significant in the regression model: gay community participation, drinking alcohol in the past month, using marijuana in the past month, and risk-reduction behavioral intentions. The odds of reporting only safe behavior decreased by 4% with a 1-unit increase on the scale measuring gay community participation. A 1-unit increase in strength of risk-reduction behavioral intentions was associated with a 30% increase in the odds of reporting no high-risk CLAI. The odds of being safe in behavior among those who drank alcohol in the past 30 days were 37% of those participants who did not drink alcohol. The odds of being safe in behavior among those who smoked marijuana in the past 30 days were 51% of those who did not use marijuana.

### Frequency of Condomless Anal Intercourse With Nonmain Partners

Analogous to Table 1, Table 3 compares sociodemographic characteristics, sexual and HIV history characteristics, substance use variables, HIV risk-specific scales, and scales measuring psychosocial domains between participants engaging in 3 or more CLAI acts with nonmain partners in the past 3 months

and participants who engaged in fewer than 3 CLAI acts. Longer time since one's most recent HIV test, the perception that safer sex is not an accepted social norm, weaker risk-reduction behavioral intentions, and lower condom-use self-efficacy were each associated with more frequent high-risk CLAI, although HIV risk knowledge scores were positively associated with reporting 3 or more unprotected acts with nonmain partners.

The multiple mixed logistic regression analysis showed that the sole significant predictor of having 3 or more CLAI acts with nonmain partners in the past 3 months was perceived condom-use peer norms (OR = 0.85; 95% confidence interval = 0.77, 0.94; P = .01). When the perceived condom-use peer norm score increased by 1 unit, the odds of reporting 3 or more CLAI acts with nonmain partners decreased by 15%.

### DISCUSSION

We examined the influence of a diverse array of characteristics that have been hypothesized to be associated with HIV risk by using analyses that took into account their intercorrelated nature. The picture that emerged underscores the combined associations of sexual risk practices with alcohol and illicit drug use; perceived safer-sex peer norms, condom attitudes, and risk-reduction intentions; recency of HIV testing; and

**TABLE 2—Results of a Multiple Mixed Logistic Regression Predicting No High-Risk Condomless Anal Intercourse Among Black Men Who Have Sex With Men: Milwaukee, WI; Cleveland, OH; and Miami Beach, FL; 2012–2014**

Covariate	No.	OR (95% CI)	P
Gay community participation scale		0.96 (0.93, 1.00)	.05
Drank alcohol in the past 30 d			.01
Yes	376	0.37 (0.18, 0.79)	
No	68	1.00 (Ref)	
Used marijuana in the past 30 d			.01
Yes	265	0.51 (0.32, 0.83)	
No	179	1.00 (Ref)	
Risk reduction behavioral intentions scale		1.30 (1.21, 1.40)	<.01

Notes. CI = confidence interval; OR = odds ratio. Area under the receiver operating characteristic curve = 0.778, a measure of the model's discrimination ability in which random classification corresponds to 0.5 and perfect classification 1.0. All variables with P < .2 in Table 1 were tested for inclusion in the set of predictors.



**TABLE 3—Characteristics of Higher-Risk Participants Who Had Condomless Anal Intercourse With Nonmain Partners <3 Times vs ≥3 Times: Black Men Who Have Sex With Men: Milwaukee, WI; Cleveland, OH; and Miami Beach, FL; 2012–2014**

Domain or Variable	<3 High-Risk CLAI Acts (n = 81), % (No.) or Mean ±SE	≥3 High-Risk CLAI Acts (n = 72), % (No.) or Mean ±SE	P
<b>Sociodemographic characteristics</b>			
Male gender	92.5 (75)	93.1 (67)	.91
Age, y <sup>a</sup>	26.7 ±1.3	27.5 ±1.2	.38
Hispanic ethnicity <sup>b</sup>	3.8 (3)	9.9 (7)	
Low education (≤ high school)	54.3 (44)	56.9 (41)	.75
Attends school	18.5 (15)	25.0 (18)	.33
Currently employed	50.6 (41)	48.6 (35)	.81
Low income (< \$10 000 annually) <sup>a</sup>	61.7 (50)	63.9 (46)	.79
Unstable housing situation	8.6 (7)	11.1 (8)	.61
<b>Sexual, STI, and HIV testing history</b>			
Completely gay orientation	54.3 (44)	43.1 (31)	.17
Had main male partner > 1 y	24.7 (20)	18.1 (13)	.32
Had an STI in past 6 mo <sup>a</sup>	12.5 (10)	13.9 (10)	.8
Never tested for HIV or tested more than 1 y ago	58.0 (47)	63.9 (46)	.46
Was HIV+ at most recent test	29.6 (24)	31.9 (23)	.76
Time since most recent HIV test, years <sup>b,c</sup>	0.9 ±0.5	2.3 ±0.5	.03
<b>Substance use in past 30 d</b>			
Drank alcohol	92.6 (75)	93.1 (67)	.89
Smoked marijuana	67.9 (55)	76.4 (55)	.25
Used crack or powder cocaine	14.8 (12)	18.1 (13)	.59
Used any illicit drug (excluding alcohol or marijuana)	22.2 (18)	34.7 (25)	.09
<b>HIV risk-specific scales</b>			
HIV risk knowledge	7.2 ±0.19	7.2 ±0.20	.96
Perceived condom-use peer norms	11.1 ±0.49	9.5 ±0.49	.01
Risk-reduction behavioral intentions	10.7 ±0.50	9.6 ±0.49	.01
Condom-use attitudes	12.6 ±0.44	11.6 ±0.45	.08
Condom-use self-efficacy	13.5 ±0.39	12.2 ±0.39	.01
<b>Psychosocial domain scales</b>			
Self-ascribed masculinity	13.5 ±0.44	13.7 ±0.46	.81
Gay community participation	21.4 ±0.66	21.4 ±0.68	.98
Internalized homonegativity	18.9 ±0.87	19.9 ±0.92	.4
Resilience	43.9 ±0.55	43.2 ±0.58	.38
AIDS conspiracy beliefs	18.4 ±0.97	19.6 ±0.98	.32
Religious and church involvement	17.1 ±0.66	16.9 ±0.67	.84

Notes. CLAI = condomless anal intercourse; STI = sexually transmitted infection.

<sup>a</sup>Up to 2 participants were missing data on predictor variables.

<sup>b</sup>P value was not reported because of a small cell count (n < 5).

<sup>c</sup>Ten individuals did not report time since their most recent HIV test.

indicators of socioeconomic distress. Many of these variables were associated not only with whether men engaged in CLAI outside a seroconcordant main partner relationship but also how often they did so.

Psychosocial domains such as internalized homonegativity, self-ascribed masculinity,

and HIV conspiracy beliefs were generally not associated with risk behavior. Although resilience distinguished between men who did or did not report high-risk CLAI in unadjusted bivariate analyses, gay community participation was the only psychosocial domain that remained significant in the

adjusted analyses and it was related to greater risk. This may be because an individual's presence in gay-identified venues and online environments presents greater risk opportunities. There can be little doubt that factors such as resilience, masculinity, and internalized homonegativity play important roles in the lives of many racial-minority MSM. However, and like other studies,<sup>21,22,51</sup> this research did not confirm the independent association of these domains with riskiness or safety in sexual behavior.

One in 4 participants reported that he was HIV-positive, an alarming level of disease prevalence comparable to that usually found in developing countries devastated by AIDS. Although most men in this sample reported having had an HIV test at some point in their lives, one third of men had not been tested in the past year. Efforts are needed to encourage more regular and frequent HIV testing among Black MSM.

Although the field often emphasizes the identification of factors associated with high-risk sexual behavior, the majority of participants in this sample either did not report CLAI in the past 3 months or did so only with their single HIV-concordant main partner. From a strengths-based perspective, these findings suggest that HIV prevention interventions should not only help persons develop protective HIV-related norms, attitudes, and intentions but also attempt to address socioeconomic disparities—including those related to income and employment—that contribute to risk. Integrated HIV and substance abuse prevention and treatment are also critical.

In contrast to most previous research, the present study recruited social networks of African American MSM based on their friendship interconnections rather than presence in gay-identified venues. Racial minority MSM do not always attend gay-identified venues, and network recruitment affords a strategy for reaching men who might otherwise be hidden in the community.<sup>52</sup> It is noteworthy that, when asked to identify MSM friends in their social networks, the large majority of participants identified friends who were other African American men. Network enrollment methods may be useful not only for reaching racial minority MSM in the community—many of whom in this study

were HIV-positive—but also for delivering HIV prevention interventions for risk-behavior reduction, to promote regular HIV testing, or to encourage HIV medical care engagement.<sup>52</sup> The current study's findings that perceived social norms strongly influenced participants' behavior practices provides support for the approach of strengthening norms for HIV prevention within naturally existing social networks of African American MSM.

The study has several limitations. Because the study recruited social networks of Black MSM, rather than a true representative probability sample, analyses had to take into account potential dependence of participant responses within social networks. Although we determined associations between conceptually defined characteristics with risk behavior, this methodology does not demonstrate causality, especially because predictor and outcome variables were assessed at a single point. Stigmatized activities may have been underreported, although audio computer-assisted self-interview assessment reduces self-presentation bias.<sup>53</sup> The retrospective period for defining participants' level of risk behavior was the past 3 months, short enough for reliable reports of sexual practices<sup>54</sup> but of a duration that could underestimate levels of longer-term risk behavior.

It is possible that the risk levels of some participants were miscategorized. For example, an HIV-negative participant who engaged in CLAI with an HIV-infected main partner who is in medical care and virally suppressed is at lower risk for contracting HIV infection than if the partner were viremic. We did not assess whether HIV-positive partners were in medical care. HIV risk among African American MSM is influenced by the makeup of their sexual networks,<sup>25,52</sup> and this study did not assess sexual network characteristics. Finally, HIV concordance was defined on the basis of what participants reported about themselves and about what their partners said to them. Some individuals may have misrepresented or not known their true HIV status.

Antiretroviral therapy can greatly reduce viral load among persons living with HIV infection and, in turn, reduce their likelihood of transmitting the disease to sexual partners.<sup>5</sup> Preexposure ART prophylaxis regimens

diligently followed by high-risk but uninfected MSM also carry protective benefit.<sup>6</sup> These biomedical developments are critical new tools for HIV prevention. However, their impact will be determined by ART coverage and adherence, and neither is likely to be quick or complete. There remains an urgent need for improved risk-behavior reduction interventions for Black MSM and for integrated behavioral, social, and biomedical prevention. **AJPH**

### CONTRIBUTORS

J. A. Kelly, J. S. St Lawrence, and Y. A. Amirkhani designed the overall study, developed the assessment measures, and conceptualized and maintained scientific oversight of the intervention. S. S. Tarima conceptualized and performed the statistical analyses. W. J. DiFranceisco oversaw the study's data collection and management, and assisted S. S. Tarima in the statistical analyses.

### ACKNOWLEDGMENTS

This research was supported by grants R01-MH089128 and P30-MH52776 from the National Institute of Mental Health.

We thank Timothy L. McAuliffe for consultation related to the statistical analyses.

### HUMAN PARTICIPANT PROTECTION

The study was conducted following a protocol that was approved by the Medical College of Wisconsin institutional review board. Written informed consent was obtained from all participants.

### REFERENCES

- Centers for Disease Control and Prevention. Estimated HIV incidence among adults and adolescents in the United States, 2007–2010. *HIV Surveill Supp Rep*. 2012; 17(4):1–6.
- Centers for Disease Control and Prevention. HIV among gay and bisexual men. 2010. Available at: <http://www.cdc.gov/hiv/risk/gender/MSM/facts>. Accessed January 4, 2015.
- Centers for Disease Control and Prevention. Cases of HIV infection and AIDS in the United States and dependent areas, 2005. *HIV/AIDS Surveill Rep*. 2006(17): 1–33.
- Catania JA, Osmond D, Stall RD, et al. The continuing HIV epidemic among men who have sex with men. *Am J Public Health*. 2001;91(6):907–914.
- Cohen MS, Chen YQ, McCauley M, et al. Prevention of HIV-1 infection with early antiretroviral therapy. *N Engl J Med*. 2011;365(6):493–505.
- Grant RM, Lama JR, Anderson PL, et al. Pre-exposure chemoprophylaxis for HIV prevention in men who have sex with men. *N Engl J Med*. 2010;363(27): 2587–2599.
- Bingham TA, Harawa NT, Johnson DF, et al. The effect of partner characteristics on HIV infection among African American men who have sex with men in the Young Men's Survey, Los Angeles, 1999–2002. *AIDS Educ Prev*. 2003;15(1, suppl A):39–52.
- Crosby R, Holtgrave DR, Stall R, Peterson JL, Shouse L. Differences in HIV risk behaviors among Black and White men who have sex with men. *Sex Transm Dis*. 2007;34(10):744–748.

9. Millett GA, Flores SA, Peterson JL, Bakeman R. Explaining disparities in HIV infection among Black and White men who have sex with men: a meta-analysis of HIV risk behaviors. *AIDS*. 2007;21(15):2083–2091.

10. Millett GA, Peterson JL, Wolitski R, Stall R. Greater risk for HIV infection of Black men who have sex with men: a critical literature review. *Am J Public Health*. 2006;96(6):1007–1019.

11. German D, Sifakis F, Maulsby C, et al. Persistently high prevalence and unrecognized HIV infection among men who have sex with men in Baltimore: the BESURE study. *J Acquir Immune Defic Syndr*. 2011;57(1): 77–87.

12. Torian LV, Makki HA, Menzies IB, Murrill CS, Weisfuse IB. HIV infection in men who have sex with men, New York City Department of Health sexually transmitted disease clinics, 1990–1999: a decade of serosurveillance finds that racial disparities and associations between HIV and gonorrhea persist. *Sex Transm Dis*. 2002;29(2):73–78.

13. Valleroy LA, MacKellar DA, Secura GM, Schal SK. High HIV prevalence and incidence among young African American men who have sex with men in six US cities: what factors are contributing? Poster presented at: the XIV International Conference on AIDS; July 8, 2002; Barcelona, Spain. Abstract MoPec 3429.

14. MacKellar DA, Valleroy LA, Secura GM, et al. Unrecognized HIV infection, risk behaviors, and perceptions of risk among young men who have sex with men: opportunities for advancing HIV prevention in the third decade of HIV/AIDS. *J Acquir Immune Defic Syndr*. 2005;38(5):603–614.

15. Halkitis PN, Parsons JT, Wolitski RJ, Remien RH. Characteristics of HIV antiretroviral treatments, access, and adherence in an ethnically-diverse sample of men who have sex with men. *AIDS Care*. 2003;15(1):89–102.

16. Millett GA, Peterson JL, Flores SA, et al. Comparisons of disparities and risks of HIV infection in Black and other men who have sex with men in Canada, UK, and USA: a meta-analysis. *Lancet*. 2012;380(9839): 341–348.

17. Mays VM, Cochran SD, Zamudio A. HIV prevention research: are we meeting the needs of African American men who have sex with men? *J Black Psychol*. 2004; 30(1):78–105.

18. Halkitis PN, Wolitski RJ, Millett GA. A holistic approach to addressing HIV infection disparities in gay, bisexual, and other men who have sex with men. *Am Psychol*. 2013;68(4):261–273.

19. Rothenberg R, Peterson J, Brown M, et al. Heterogeneity of risk among African-American men who have sex with men. *Int J STD AIDS*. 2007;18(1): 47–54.

20. Hampton MC, Halkitis PN, Storholm ED, et al. Sexual risk taking in relation to sexual identification, age, and education in a diverse sample of African American men who have sex with men (MSM) in New York City. *AIDS Behav*. 2013;17(3):931–938.

21. Kelly JA, St. Lawrence JS, Amirkhani YA, et al. Levels and predictors of HIV risk among Black men who have sex with men. *AIDS Educ Prev*. 2013;25(1): 49–61.

22. Kelly JA, DiFranceisco WJ, St Lawrence JS, Amirkhani YA, Anderson-Lamb M. Situational, partners, and contextual factors associated with level of risk at most recent intercourse among Black men who have sex with men. *AIDS Behav*. 2014;18(1):26–35.

23. Hart T, Peterson JL; Community Intervention Trial for Youth Study Team. Predictors of risky sexual behavior among young African American men who have sex with men. *Am J Public Health*. 2004;94(7):1122–1124.
24. Bakeman R, Peterson JL; Community Intervention Trial for Youth Study Team. Do beliefs about HIV treatments effect peer norms and risky sexual behavior among African American men who have sex with men? *Int J STD AIDS*. 2007;18(2):105–108.
25. Peterson JL, Rothenberg R, Kraft JM, Beeker C, Trotter R. Perceived condom norms and HIV risks among social and sexual networks of young African American men who have sex with men. *Health Educ Res*. 2009;24(1):119–127.
26. Tobin K, Davey-Rothwell M, Yang C, Siconolfi D, Latkin C. An examination of associations between social norms and risky alcohol use among African American men who have sex with men. *Drug Alcohol Depend*. 2014;134:218–221.
27. Harawa NT, Williams JK, Ramamurthi HC, et al. Sexual behavior, sexual identity, and substance abuse among low-income bisexual and non-gay-identifying African American men who have sex with men. *Arch Sex Behav*. 2008;37(5):748–762.
28. Browne DC, Clubb PA, Wang Y, Wagner F. Drug use and high-risk sexual behaviors among African American men who have sex with men and men who have sex with women. *Am J Public Health*. 2009;99(6):1062–1066.
29. Operario D, Smith CD, Arnold E, Kegeles S. Sexual risk and substance use behaviors among African American men who have sex with men and women. *AIDS Behav*. 2011;15(3):576–583.
30. Mimiaga MJ, Reinsler SL, Fontaine YM, et al. Walking the line: stimulant use during sex and HIV risk behavior among Black urban MSM. *Drug Alcohol Depend*. 2010;110(1–2):30–37.
31. Bingham TA, Harawa NT, Williams JK. Gender role conflict among African American men who have sex with men and women: associations with mental health and sexual risk and disclosure behaviors. *Am J Public Health*. 2013;103(1):127–133.
32. Brooks RA, Etzel MA, Hinojos E, Henry CL, Perez M. Preventing HIV among Latino and African American gay and bisexual men in a context of HIV-related stigma, discrimination, and homophobia: perspectives of providers. *AIDS Patient Care STDS*. 2005;19(11):737–744.
33. Herek GM, Cogan JC, Gillis JR, Glunt EK. Correlates of internalized homophobia in a community sample of lesbians and gay men. *J Gay Lesb Med Assoc*. 1998;2:17–25.
34. Stokes JP, Peterson JL. Homophobia, self-esteem, and risk for HIV among African American men who have sex with men. *AIDS Educ Prev*. 1998;10(3):278–292.
35. Balaji AB, Oster AM, Viall AH, et al. Role flexing: how community, religion, and family shape the experiences of young Black men who have sex with men. *AIDS Patient Care STDS*. 2012;26(12):730–737.
36. Fields EL, Bogart LM, Smith KC, et al. HIV risk and perceptions of masculinity among young Black men who have sex with men. *J Adolesc Health*. 2012;50(3):296–303.
37. Bogart LM, Thorburn S. Are HIV/AIDS conspiracy beliefs a barrier to HIV prevention among African Americans? *J Acquir Immune Defic Syndr*. 2005;38(2):213–218.
38. Hoyt MA, Rubin LR, Nemeroff CJ, et al. HIV/AIDS-related institutional mistrust among multi-ethnic men who have sex with men: effects on HIV testing and risk behaviors. *Health Psychol*. 2012;31(3):269–277.
39. Foster ML, Arnold E, Rebchook G, Kegeles SM. “It’s my inner strength”: spirituality, religion, and HIV in the lives of young African American men who have sex with men. *Cult Health Sex*. 2011;13(9):1103–1117.
40. Kubicek K, McNeeley M, Holloway IW, Weiss G, Kipke MD. “It’s like our own little world”: resilience as a factor in participating in the ballroom community subculture. *AIDS Behav*. 2013;17(4):1524–1539.
41. O’Leary A, Jemmott JB, Stevens R, Rutledge SE, Icard LD. Optimism and education buffer the effects of syndemic conditions on HIV status among African American men who have sex with men. *AIDS Behav*. 2014;18(11):2080–2088.
42. Bandura A. *Social Foundations of Thought and Action: A Social-Cognitive Theory*. Englewood Cliffs, NJ: Prentice Hall; 1986.
43. Fishbein M, Ajzen I. *Belief, Attitude, Intention, and Behavior: An Introduction to Theory and Research*. Reading, MA: Addison Wesley; 1975.
44. Fisher JD, Fisher WA, Williams SS, Malloy TE. Empirical tests of an information-motivation-behavioral skills model of AIDS-prevention behavior with gay men and heterosexual university students. *Health Psychol*. 1994;13(3):238–250.
45. Kadushin C. The friends and supporters of psychotherapy: on social circles in everyday life. *Am Sociol Rev*. 1966;31:786–802.
46. García LI, Lechuga J, Zea MC. Testing comprehensive models of disclosure of sexual orientation in HIV-positive Latino men who have sex with men (MSM). *AIDS Care*. 2012;24(9):1087–1091.
47. Myers MF. Men sexually assaulted as adults and sexually abused as boys. *Arch Sex Behav*. 1989;18(3):203–215.
48. Wagner GJ. Internalized homophobia scale. In: Davis CM, Yaber WL, Bauserman R, Schreer G, Davis SL, eds. *Handbook of Sexuality-Related Measures*. Thousand Oaks, CA: Sage Publications; 1998:371–372.
49. Wagnild GM, Young HM. Development and psychometric evaluation of the Resilience Scale. *J Nurs Meas*. 1993;1(2):165–178.
50. Forehand R, Brody GH, Armistead L, et al. The role of community risks and resources in the psychosocial adjustment of at-risk children: an examination across two community contexts and two informants. *Behav Ther*. 2000;31(3):395–414.
51. Peterson JL, Bakeman R, Sullivan P, et al. Social discrimination and resiliency are not associated with differences in prevalent HIV infection in Black and White men who have sex with men. *J Acquir Immune Defic Syndr*. 2014;66(5):538–543.
52. Amirkhanian YA. Social networks, sexual networks, and HIV risk to men who have sex with men. *Curr HIV/AIDS Rep*. 2014;11(1):81–92.
53. Turner CF, Ku L, Rogers SM, et al. Adolescent sexual behavior, drug use, and violence: increased reporting with computer survey technology. *Science*. 1998;280(5365):867–873.
54. Kauth MR, St Lawrence JS, Kelly JA. Reliability of retrospective assessments of sexual HIV risk behavior: a comparison of biweekly, three-month, and 12-month self-reports. *AIDS Educ Prev*. 1991;3(3):207–214.