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## Discussion of HIV Status by Serostatus and Partnership Sexual Risk among Internet-Using MSM in the United States

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### Abstract

Men who have sex with men (MSM), particularly black MSM, are disproportionately infected with HIV. Little is known about how discussion of HIV status between partners varies among MSM by race/ethnicity, and by HIV transmission risk. Among a national survey of 2,031 MSM reporting 5,410 partnerships, black MSM, especially black HIV-positive MSM, serodiscussed with UAI partners less than did white MSM. Although non-black HIV-positive, non-black HIV-negative MSM, and black HIV-negative MSM were more likely to report serodiscussion with UAI partners, black HIV-positive MSM were not. Differential serodiscussion may play a role in explaining the racial/ethnic disparity in HIV incidence.

### Introduction

In the United States, men who have sex with men (MSM) accounted for at least 61% of new HIV infections in 2009 and are the only risk group with increasing HIV incidence since 2001.<sup>1–4</sup> Black MSM are disproportionately infected with HIV, comprising 37% of new infections among MSM.<sup>3–6</sup> The causes of racial/ethnic disparities in HIV among MSM remain elusive.<sup>5</sup> For most behavioral risk factors, such as unprotected anal intercourse (UAI), large number of partners, and substance use, black MSM have reported lower or equivalent levels compared to MSM of other racial/ethnic groups.<sup>1, 5–11</sup> Because individual factors have been unable to explain the disparities among MSM, there has been a call to understand higher-order dyadic (partnership) and network-level properties, including the extent to which men discuss HIV status with their sex partners before having sex.<sup>12</sup>

In this report, we use the term serodiscussion to connote the mutual discussion of HIV status, whether positive or negative, before first sex. It is important to analyze HIV status disclosure as *mutual* serodiscussion for two reasons. First, to acknowledge that responsibility for discussing HIV status does not only rest with HIV-positive MSM. Second,

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it is the status of both partners in a sexual dyad that is critical to adopting informed HIV risk reduction practices. Thus, serodiscussion is a dyadic-level practice, and is relevant regardless of HIV serostatus.

Recently published results from the National HIV Behavioral Surveillance System found that having partners of unknown HIV status was the only analyzed characteristic more prevalent among black participants, although serodiscussion was not measured.<sup>13</sup> Evidence suggests that black MSM have a similar likelihood of lifetime testing compared to white men; yet are tested less frequently.<sup>5</sup> While frequency of testing may help to explain the differential likelihood of having an unknown status partner, a lack of serodiscussion may be another contributing factor. Serodiscussion is the essential pre-requisite for risk-reducing serosorting or seroadaptive behaviors and allows men to make informed decisions about their sexual behaviors.<sup>14-17</sup>

While several recent studies have reported lower serodiscussion among black MSM, to date, no study has examined serodiscussion by race/ethnicity in MSM stratified by HIV status.<sup>18, 19</sup> Furthermore, the importance of serodiscussion in a sexual partnership depends on whether the partners have UAI, because if condom use is complete then serodiscussion is less relevant. Men may preferentially have serodiscussion before first sex if UAI is planned, but partnership sexual risk behavior (i.e. UAI) has not been accounted for in previous analyses. To better understand racial/ethnic differences in serodiscussion among MSM, we examined serodiscussion before first sex by race/ethnicity, participant HIV status, and UAI, among a national online survey of MSM.

## Methods

### Recruitment and Study Design

Our data are baseline responses to a 12-month, prospective online study of HIV behavioral risks among MSM in the United States.<sup>20</sup> Between August – December 2010, internet-using MSM were recruited through banner advertisements on social networking websites, including Facebook, MySpace, Black Gay Chat, and Adam4Adam. Eligibility criteria for participation in the baseline survey comprised being male, aged ≥ 18 years, and having sex with a male in the previous 12 months. The study was reviewed and approved by the Institutional Review Board of Emory University.

### Data and Measures

The survey collected self-reported demographic information, HIV testing history and most recent results, and sexual behaviors. Place of residence was collected for the subset of participants who were eligible for and agreed to receive an HIV at-home self-test kit, a key procedure in the broader prospective study. Participants who had an anal or oral sex partner within the past six months were asked to provide their total number of male partners in that time frame, and also to complete a demographic and behavioral inventory for up to five recent male sex partners.

To assess serodiscussion with each partner, participants were asked, “Did you and your partner share both of your HIV statuses with each other before you first had sex?” Pilot-testing on Facebook (n= 1,077) revealed a high degree of acceptance of this question but resulted in a change from the original phrase ‘discuss both of your HIV status’, used by others. Some pilot participants reported that “discussion” implied a physical conversation and was not inclusive of the myriad ways, particularly online, that HIV serostatuses may be shared between partners. UAI was defined as lack of condom use at any point during any anal sexual encounter with the partner.

A total of 6,104 participants were eligible and began the online survey. As detailed in Supplemental Digital Content 2, among them, 3,768 (62%) answered the question regarding having a male sex partner within the past six months and reported at least one partner. The analysis was limited to white non-Hispanic, black non-Hispanic, and Hispanic participants, with a history of HIV testing and reported their HIV status, and provided sufficient behavioral data. Dyads were dropped if incomplete data was provided for the behaviors analyzed. The final analytical sample size of data was 2,031 respondents reporting 5,410 dyads.

## Analysis

Because our research question was inherently about the interactions of race/ethnicity with HIV status and UAI, our primary analysis was a stratified table of dyadic serodiscussion by race/ethnicity, stratified by levels of HIV status and UAI. Percentages of dyads with whom serodiscussion occurred and odds ratios (ORs) that compared disclosure by race/ethnicity among the levels of UAI/HIV status were computed. Because respondents could contribute multiple dyads to this table, we controlled for repeated observations of respondents by fitting stratified repeated measure models, using a generalized estimating equations (GEE) logistic regression model with an exchangeable  $\ln(\text{OR})$  correlation structure, to obtain robust comparisons within each stratum. To describe the specific ORs for serodiscussion between UAI and non-UAI partners among respondents of each race/ethnicity with each HIV serostatus, we fit a repeated measures model that was fully specified with all interactions and computed these linear contrasts.

Though serodiscussion is primarily a dyadic phenomenon, we performed secondary analyses at the individual participant level. The first was analogous to the dyadic analysis and assessed whether serodiscussion occurred with any UAI partners, among those individuals who reported any UAI, and any serodiscussion with non-UAI partners, among those reporting non-UAI partners. These proportions were stratified by participant race/ethnicity and HIV serostatus, and compared with  $\chi^2$  tests. To best compare individual-level serodiscussion patterns with UAI and non-UAI partners, a matched analysis was then conducted among respondents who reported both types of partnerships. Matched-pair contingency tables were constructed to examine whether serodiscussion was as likely with UAI dyads as with non-UAI dyads, and matched ORs and exact McNemar's test were computed. These tables were stratified by race/ethnicity and HIV status.

We additionally examined the time since last HIV test for HIV-negative participants, a key aspect of the quality of the information used in serodiscussion. This information was available for participants only and this analysis was necessarily restricted to those dyads where first sex was after the respondent's most recent HIV test. The median time difference between dyadic first sex and last HIV test was computed and compared by serodiscussion, race/ethnicity, and sexual risk, using the Wilcoxon Rank-Sum test.

## Results

As presented in Table 1, the majority of the analytical sample was white non-Hispanic (65%), with fewer black non-Hispanic (20%) and Hispanic (15%) men. Twelve percent of respondents reported being HIV-positive. The median participant age was 29 years. Among the 930 participants for whom US residential address data were available, 15% of respondents were from the northeast, 19% from the midwest, 41% from the south, 26% from the west, and less than 1% were from Puerto Rico. The median total number of male partners reported in the previous six months was 3. Sixty-one percent of the total count of male partners reported was captured in the demographic and behavioral inventory. Among the 75% of the sample reporting 5 or less total partners, 88% of partners were provided.

As shown in Table 1, among 5,410 dyads reported, 45% involved UAI, and serodiscussion occurred in 65%. Partnership dyads reported by white participants (68%) were significantly more likely than those reported by black (57%) or Hispanic (59%) participants to participate in serodiscussion ( $p < 0.0001$ ). Per Table 1, a total of 743 or 14% of all dyads had involved both UAI and no serodiscussion. Stratified by race/ethnicity this was 13% of dyads with white respondents, 17% of dyads with black respondents, and 17% of dyads with Hispanic respondents had both UAI and no serodiscussion ( $p = 0.001$ ).

Table 2 displays serodiscussion within dyads, stratified by index participant race/ethnicity and serostatus, and UAI. Among the UAI partnerships of both HIV-positive and HIV-negative participants, serodiscussion was significantly less frequent for black and Hispanic MSM than for white MSM. Specifically, among HIV-positive MSM, black and Hispanic men were 60% and 40% less likely than white men to serodiscuss with UAI partnerships; among HIV negative MSM, black and Hispanic men were 35% and 36% less likely than white men to serodiscuss with UAI partnerships. In protected AI or oral sex partnerships, there was a significant racial/ethnic difference in serodiscussion among HIV-negative men; black and Hispanic HIV-negative men were 30% less likely to report serodiscussion than were white HIV-negative MSM. There were no significant racial/ethnic differences in serodiscussion in protected AI/oral sex partnerships among HIV-positive men.

Serodiscussion was more commonly reported with UAI partners than non-UAI partners in every race-HIV status group except black HIV-positive and Hispanic HIV-positive men (Table 2). Model-based estimates that adjusted for repeated measures indicated that white HIV-negative, white HIV-positive, black HIV-negative, and Hispanic HIV-negative were more likely to report serodiscussion with UAI than non-UAI partners. However, black HIV-positive and Hispanic HIV-positive men were not significantly more likely to report serodiscussion with UAI partners as compared to non-UAI partners (Table 2). Nearly identical relationships between serodiscussion, race/ethnicity, HIV status, and UAI were found at the individual participant level (Supplemental Digital Content 1).

We next examined the recentness of HIV-negative test results utilized for serodiscussion. Among the UAI dyads of HIV-negative respondents whose last HIV test was before the date of first sex, the median days between last test and first sex was 243 days for white, 212 for black, and 182 for Hispanic participants ( $p = 0.33$ ). Among non-UAI dyads, this duration was 153 days for white, 243 for black, and 183 for Hispanic participants ( $p = 0.02$ ). Overall, a lack of serodiscussion was associated with 50% increased duration from last HIV test to first sex (274 vs. 183 days,  $p = 0.001$ ).

## Discussion

In a geographically diverse group of internet-using US MSM, nearly two-thirds reported mutual discussion of HIV serostatus before first sex. There were significant differences in serodiscussion by participant race/ethnicity, participant HIV status, and UAI, and significant interactions by these characteristics. Our results further those of previous studies by considering how serodiscussion differs with UAI partners, and by reporting data from a large, national sample of MSM.

Discussion of serostatus allows men to make informed seroadaptive decisions about their sexual behaviors, and reduce risk of transmission.<sup>14-17</sup> Yet, a 2011 report on MSM in San Francisco found only two-thirds of respondents knew the HIV status of their partner before first sex, and that black MSM were less likely to discuss HIV status before first sex than were white or Hispanic men.<sup>18</sup> However, these data were collected only from men who engaged in seroadaptive behaviors, and data from this report included small numbers of

MSM of color. Bird and colleagues examined the intersection of disclosure and race/ethnicity, accounting for participant serostatus, but only among HIV-positive men; HIV-positive black men were less likely to disclose their HIV-positive status to both HIV-positive and -negative partners compared to HIV-positive white men.<sup>19</sup> A more recent study assessed discussion of serostatus among MSM in New York by the HIV status of the participant, but among black MSM only and with the analysis limited to most recent sexual partners.<sup>21</sup> Of these men, 69% discussed their HIV status with their last sexual partners, and there was no significant difference in the proportion who discussed their HIV status by participant serostatus.<sup>21</sup>

With respect to non-stratified results, our findings agreed with previous reports. For example, most prior reports have found, as did we, that black men are less likely to discuss their HIV status than are men of other race/ethnicities.<sup>19, 22</sup> Similarly, previous studies have reported that black HIV-positive MSM have lower rates of disclosure compared to white HIV-positive MSM, and our analysis confirmed this with a larger and more geographically robust group of respondents.<sup>18, 19, 21</sup> These racial differences have been attributed to minority stress and cultural attitudes in the black community and homophobia.<sup>22-31</sup> Based on this understanding, broader efforts to address the intersecting concerns of homophobia and stigma around HIV positivity are needed broadly. To the extent that homophobia and stigma are causally associated with less discussion of HIV serostatus, communities of color may have particular opportunities to improve serodiscussion through the development and implementation of interventions to reduce homophobia and stigma.

Our stratified analyses, however, provide additional insight into racial/ethnic differences in serodiscussion by describing these in relation to UAI. The differences of greatest magnitude in serodiscussion by race/ethnicity were between the UAI partnerships of white and black HIV-positive participants: serodiscussion was nearly 20% greater among partnerships of white participants, compared to those of black participants reported serodiscussion, and only about half of HIV-positive black men in UAI partnerships reported serodiscussion before first sex. To the extent that disclosing HIV-positive status impacts decisions to have sex, choose specific sexual activities, and/or to use a condom, lower levels of serodiscussion may drive or perpetuate black/white disparities in HIV prevalence. Furthermore, HIV-positive black and Hispanic MSM were the only race/HIV status-specific group who were not more likely to report serodiscussion with UAI than with non-UAI partners at the dyad level.

We found that the interval from last negative HIV test to first sex was comparable across racial/ethnic groups for UAI partners, but this duration was greater for non-UAI partners of black participants, though such partnerships pose a lesser transmission risk. The association between serodiscussion and more recent HIV test results, and presumably more frequent HIV testing, is a novel finding. It is possible that those who have recently tested feel more confident sharing their serostatus or that common behavioral factors underlie both risk-reducing behaviors of more frequent testing and presexual serodiscussion. More research into this finding is needed. An important limitation to these findings is that the restriction to partnerships that began after the most recent HIV test skews these results towards more recently formed relationships.

These findings have implications for the greater transmission among black and Hispanic MSM and highlight a need to focus on promoting serodiscussion among all MSM. To the extent that serodiscussion leads to a reduction in sexual risk behaviors, focus should be given to the development and implementation of interventions to promote serodiscussion among black and Hispanic MSM, including those who are HIV-positive. Despite the importance of routine HIV screening to decrease HIV transmission among MSM, testing programs may not reach their full prevention potential unless paired with pre-sexual

discussion of serostatus<sup>14, 16, 32, 33</sup>. More research is needed to understand exactly why black HIV-positive men are less likely to disclose than their peers, to develop interventions accordingly, and to promote serodiscussion before first sex as normative in gay and other MSM communities.

## Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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**Table 1**

Characteristics of participants and dyads in a national online study of MSM (n = 2,031 participants; 5,410 dyads)

	<b>Participants n (%)</b>	<b>Dyads n (%)</b>	<b>Dyadic serodiscussion n (%)</b>	<b><math>\chi^2</math> p-value</b>
<b>Participant Race</b>				
White non-Hispanic	1320 (65)	3562 (66)	2435 (68)	< .0001
Black non-Hispanic	401 (20)	1015 (19)	578 (57)	
Hispanic	310 (15)	833 (15)	494 (59)	
<b>Participant HIV Status</b>				
Positive	249 (12)	719 (13)	436 (61)	0.01
Negative	1782 (88)	4691 (87)	3071 (65)	
<b>Participant Age</b>				
18–24	610 (30)	1554 (29)	990 (64)	0.004
25–29	407 (20)	1038 (19)	641 (62)	
30–39	465 (22)	1278 (24)	825 (65)	
40+	549 (27)	1540 (28)	1051 (68)	
<b>Partnership Sexual Repertoire</b>				
Unprotected Anal Intercourse (UAI)	n/a	2448 (45)	1705 (70)	< .0001
Protected Anal Intercourse / Oral Sex		2962 (55)	1802 (61)	
<b>One-time sexual encounter</b>				
Yes	n/a	2486 (46)	1428 (57)	< .0001
No		2924 (54)	2079 (71)	
<b>Overall</b>	2031 (100)	5410 (100)	3507 (65)	

Table 2

Mutual serodiscussion among dyads, stratified by participant race and serostatus, and partnership sexual risk behavior, in a national online sample of MSM (5,410 dyads)

Participant Race/Ethnicity	HIV-negative Participants <sup>1</sup>						HIV-positive Participants <sup>1</sup>					
	UAI Partners		Protected AI/Oral Sex Partners		Model <sup>2</sup>		UAI Partners		Protected AI/Oral Sex Partners		Model <sup>2</sup>	
	total	(%)	OR	(95% CI)	total	(%)	OR	(95% CI)	total	(%)	OR	(95% CI)
White non-Hispanic	1015/1384	(73)	ref.		1127/1739	(65)	ref.		90/159	(57)	ref.	
Black non-Hispanic	217/339	(64)	0.65	(0.50, 0.83)	256/467	(55)	0.66	(0.54, 0.81)	55/112	(49)	0.74	(0.46, 1.20)
Hispanic	198/312	(63)	0.64	(0.49, 0.82)	258/450	(57)	0.73	(0.59, 0.90)	16/35	(46)	0.65	(0.31, 1.35)
adjusted p-value <sup>3</sup>	0.007				0.022				0.014			

<sup>1</sup>Based on self-report

<sup>2</sup>From a GEE model that adjusted for repeated measures on participants as well as participant race/ethnicity, and sexual repertoire

<sup>3</sup>From stratified GEE models