

Greater Risk for HIV Infection of Black Men Who Have Sex With Men: A Critical Literature Review

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HIV rates are disproportionately higher for Black men who have sex with men (MSM) than for other MSM. We reviewed the literature to examine 12 hypotheses that might explain this disparity.

We found that high rates of HIV infection for Black MSM were partly attributable to a high prevalence of sexually transmitted diseases that facilitate HIV transmission and to undetected or late diagnosis of HIV infection; they were not attributable to a higher frequency of risky sexual behavior, nongay identity, or sexual nondisclosure, or to reported use of alcohol or illicit substances. Evidence was insufficient to evaluate the remaining hypotheses.

Future studies must address these hypotheses to provide additional explanations for the greater prevalence of HIV infection among Black MSM. (*Am J Public Health*. 2006;96:1007–1019. doi:10.2105/AJPH.2005.066720)

HIV prevalence and incidence rates are significantly higher for Black men who have sex with men (MSM) than for other racial/ethnic groups of MSM in the United States.^{1–7} Even after the introduction of highly active antiretroviral therapy, the rates of disease progression and AIDS mortality for HIV-seropositive Black MSM exceed rates for HIV-seropositive MSM of other races and ethnicities.⁸

Explanations of differences in HIV rates for MSM of different races may involve more than behavior alone. Results from a 1987 prospective study of HIV infection among 1034 MSM reported higher HIV prevalence and incidence rates for Black MSM than for White MSM despite comparable reported risk behaviors.⁹ The authors found that known risk factors for HIV infection (i.e., multiple sexual partners, frequency of receptive anal intercourse, needle sharing) did not explain the differences in HIV seroprevalence or seroconversion between Black MSM and White MSM in the sample. A similar observation was reported in 1993 by another group of researchers who found higher rates of HIV infection for Black and Latino MSM than for White MSM.⁵ Multivariate adjustment for demographic factors and risk behaviors enabled the authors to statistically account for the high HIV prevalence rates for Latino MSM, but HIV seropositivity remained independently associated with Black race even after

adjustment for demographic and HIV risk behavior covariates. Likewise, a 1998 study found that HIV prevalence was higher among Black MSM than other MSM, and multivariate adjustment for factors that predicted HIV infection in the whole MSM sample did not account for factors associated with HIV infection in Black MSM.¹⁰

Unexplained high HIV prevalence and incidence rates for Black MSM continue to be reported 17 years after the first published report in the scientific literature. An article published in 2004 reported that HIV infection in young MSM was associated with older age, unemployment, being out of school, having anal sex with men (irrespective of condom use), and using crack cocaine during sex. Although young Black MSM in the sample were 9 times more likely than young White MSM to be HIV positive, the identified correlates did not account for the disproportionately high seroprevalence rates among Black MSM.¹¹

We performed a comprehensive review of the scientific literature reporting evidence for and against the possible causes of higher rates of HIV infection for Black MSM than for MSM of other races/ethnicities. Using data from diverse samples of MSM, we collected evidence on 12 hypotheses—behavioral, psychological, structural, and biological—about the greater HIV prevalence among Black

MSM. Some of the hypotheses have been proposed or suggested by others.^{11–13} Our presentation of a hypothesis is not an implicit endorsement of its premise; some hypotheses are based on stereotypes or misinformed beliefs about the lives of Black MSM. We critically examined, evaluated, and summarized the contribution of each hypothesis to elevated infection rates among Black MSM.

METHODS

We searched 5 online databases: MEDLINE, PsycINFO, ERIC, AIDSLINE, and SocioFile. We considered articles published between January 1974 and November 2005 from each of the databases except AIDSLINE, where only articles published between 1980 and 2000 are available. We conducted the literature search in 5 stages. First, we selected articles about Black populations, using the search terms “Black,” “African American,” and “Afro American.” Second, we conducted a separate search for all articles that mentioned sexual identity or behavior applicable to MSM, using the search terms “homosexual,” “bisexual,” “men who have sex with men,” “MSM,” “gay,” “same gender loving,” and “SGL.” Third, we cross-referenced the sexual identity/behavior articles with the articles on Black populations. Fourth, we narrowed the citations to quantitative studies conducted in the United States. Fifth, we performed a separate search across the databases for keywords applicable to each hypothesis. Results from these separate searches were cross-referenced with the Black MSM citations to create the universe of papers used for this review. We identified a total of 59 articles and 4 conference abstracts.

We arranged the 12 hypotheses into 3 groups: those not supported by scientific evidence, those supported by scientific evidence, and those for which there was insufficient or contrary evidence. A hypothesis was placed

in the latter category when there was a lack of evidence for or against the hypothesis that was specific to Black MSM (e.g., a single study or no studies) or when there were studies that provided data on Black MSM but the preponderance of the evidence neither confirmed nor disconfirmed the hypothesis. Scientific evidence was aggregated across studies to determine the categorization of a given hypothesis. Studies were *supportive* of a hypothesis when findings were significant ($P \leq .05$) in the direction of the hypothesis. Studies were *non-supportive* of a hypothesis when no statistical difference was reported or the findings were significant ($P \leq .05$) in the opposite direction from the hypothesis. We emphasized results from multivariate analyses, but we included results from bivariate analyses when multivariate data were unavailable.

HYPOTHESES NOT SUPPORTED BY THE SCIENTIFIC EVIDENCE

Hypothesis 1: Black MSM Are More Likely Than Other MSM to Engage in High-Risk Sexual Behavior

Unprotected anal intercourse (UAI) and multiple sexual partners are longstanding sexual risk factors associated with HIV infection.¹⁴ We evaluated evidence supporting and not supporting this hypothesis for each of these risk factors.

Unprotected anal intercourse. UAI is the single most important risk factor for HIV transmission among MSM.¹⁵ If Black MSM were more likely than other MSM to engage in UAI, this would provide the most direct explanation for racial disparities in HIV infection rates. However, most studies published from the first decade of the epidemic through the present have found comparable, if not lower, self-reported rates of UAI for Black MSM relative to other MSM.^{6,9–11,16–29}

Of 5 studies published in the first decade of the epidemic, 3 found no differences in rates of UAI practiced by MSM of different racial or ethnic groups. Data from more than 4000 White and Black MSM in 5 cities collected before the first cases of AIDS were reported (1978–1979) showed comparable rates of UAI for the 2 groups.²² These results were replicated by a seroprevalence study of MSM⁹ and by a small pilot study of

HIV-positive MSM.¹⁷ However, Linn et al. found that reported rates of recent unprotected anal sex were higher for Latino and Black MSM than for White MSM.³⁰ Similarly, Peterson and his colleagues found that among 250 Black MSM in the San Francisco Bay area, 52% reported recently engaging in UAI,³¹ a proportion that was higher than that found for White MSM in San Francisco during the same time period.³²

Fifteen studies published since 1992 either found no significant differences in UAI for MSM of different racial or ethnic groups^{6,10,16,18,19,23–25,27,28} or found that Black MSM were less likely than other MSM to engage in high-risk sexual practices.^{11,20,21,26,29} In contrast, only 3 studies published since 1992 have reported that Black MSM engaged in higher rates of UAI with male sexual partners than White MSM.^{33–35} A separate study found that Black MSM were more likely than White MSM to engage in unprotected sex,³⁶ but the study did not differentiate between vaginal and anal sex so we did not include it in our review.

Number of male sexual partners. Studies of MSM have consistently reported that compared with other MSM, Black MSM have the same number or a smaller number of male sexual partners.^{9,11,18,22,29,33,34,37} Aside from 3 studies of MSM that found no differences by race in the reported number of male sexual partners,^{9,22,33} most studies have found that Black MSM in comparison with White MSM report fewer male sexual partners in their lifetime,^{11,18} fewer current male sexual partners,^{18,29,34,37} and fewer casual male sexual partners.^{11,18,22,29}

MSM who engage in commercial sex have a greater opportunity to engage in sex with more male sexual partners than MSM who do not participate in sex trade activities. In addition, commercial sex has been associated with HIV infection among MSM in international settings.^{38,39} Greater commercial sex activity among Black MSM could partially explain disparate HIV rates; yet, except for 1 study,²⁸ most domestic comparative studies of MSM by race have reported no racial differences in the prevalence of commercial sex work activity.^{11,33,40,41}

To summarize, most studies we reviewed, particularly those conducted in the past

decade, failed to support the hypothesis that Black MSM engage in more sexual risk taking than other MSM.

Hypothesis 2: Black MSM Are Less Likely Than Other MSM to Identify as Gay or to Disclose Their Sexual Identity, Which May Lead to Increased HIV Risk Behavior

Gay identity and acculturation into the gay community have been associated with lower HIV-related risk behavior.^{42,43} If Black MSM were less likely than other MSM to identify as gay, Black MSM might be more prone to HIV-related risk behavior. To evaluate this hypothesis, we reviewed studies that compared MSM by race in 4 areas: (1) sexual identity, (2) disclosure of sexual identity or homosexual behavior, (3) associations between sexual identity and HIV risk behavior, and (4) associations between sexuality disclosure and HIV risk behavior.

Sexual identity. Data from several studies overwhelmingly supported the assertion that Black MSM are less likely than White MSM to identify as gay.^{7,16,28,34,37,44–47} Moreover, studies have found that Black MSM are less likely than other MSM to join gay-related organizations^{48,49} and read gay-related media.²⁸ Only 1 study found comparable rates of gay identification among a racially diverse sample of MSM⁴⁰; none of the studies reported higher rates of gay identification for Black MSM than for MSM of other races or ethnicities.

Disclosure of sexual identity or homosexual behavior. Black MSM are less likely than other MSM to disclose their sexual identity or behavior to close or casual associates. Black gay men,⁴⁹ Black bisexual men,^{28,48} and young Black MSM (ages 15–29)⁵⁰ are all less likely than their counterparts of other races to disclose their same-sex behavior or identity to others. One study found that as education increased, White MSM were more likely and Black MSM were substantially less likely to disclose their sexuality.⁴⁹ Investigators have also reported that HIV-positive Black MSM are less likely^{17,51} than other HIV-positive MSM or are equally likely⁵² to disclose their sexual orientation to members of their support network.

Sexual identity and HIV risk behavior. Few studies of MSM have examined sexual

identity as a predictor for HIV risk behavior by race or ethnicity. The few that have stratified by race when reporting sexual identity have failed to report HIV risk behavior by race and sexual identity.^{28,45,46} However, 2 studies that recruited only Black MSM tested the association between sexual identity and HIV risk. Hart and Peterson found that among 758 young Black MSM of varying sexual identities, sexual identity did not predict participation in receptive or insertive UAI.⁵³ Another study of 174 Black MSM reported that gay-identified Black MSM were more likely than non-gay-identified Black MSM to engage in sexual risk taking behavior.⁵⁴

Disclosure of sexuality and HIV risk behavior. Few studies have tested for associations between disclosure of sexual identity and HIV risk behavior. Most studies have examined disclosure rates by MSM in the absence of behavioral risk data^{49,51,52} or tested independent associations between race and disclosure and race and HIV risk behavior.^{17,18,28} These limitations were not found in 3 studies of disclosure. A 1992 study found that Black MSM who were uncomfortable disclosing their sexuality to others were more likely than Black MSM who were “out” to engage in unsafe sex.³¹ In contrast, a 2002 study found that Black MSM who scored lower on a scale that included measures of sexuality disclosure reported taking fewer sexual risks than Black MSM who scored higher on the scale.⁵⁴ Similarly, among 1100 young Black MSM, men who did not disclose their sexual orientation to others were less likely than those who did disclose to have 5 or more male sexual partners during their lifetime, to report having UAI with male sexual partners, and to have an HIV-positive test result.⁵⁰

To summarize, Black MSM are less likely than other MSM to identify themselves as gay or to disclose their homosexual behavior to others. However, having a nongay identity does not increase HIV risk-taking behavior with male sexual partners among Black MSM. In contrast, recently published studies of Black MSM have found that sexuality nondisclosure was associated with lower sexual risk taking with male sexual partners.

Hypothesis 3: Black MSM Are More Likely Than Other MSM to Abuse Substances, Especially Injection Drugs, That Increase Their Risk for HIV Infection

Injection drug use and sexual activity while under the influence of substances have been associated with HIV risk behavior.^{55–57} If Black MSM were more likely than other MSM to use mind-altering substances, it could partially explain observed racial differences in HIV prevalence. However, published studies relevant to this hypothesis revealed a complex picture.

Young Black MSM are as likely as or less likely than other MSM to report drug use. Studies of Black MSM aged 13 through 29 years report that compared with their non-Black peers, young Black MSM engage in lower general illicit drug use^{20,58} and comparable or lower use of amphetamines, barbiturates, LSD, nitrites, tranquilizers, and powdered cocaine.^{11,59} Contrasting results were found only for marijuana and heroin use. One study found comparable⁵⁹ and another study found greater²⁰ use of marijuana and heroin among young Black MSM relative to other young MSM.

Studies of older cohorts of MSM have also found comparable or lower drug use among Black MSM than among other MSM.^{36,60–62} Siegel et al. found no differences in use of hard drugs (i.e., crack, cocaine, heroin, speed) among a diverse sample of MSM aged 50 years or older.³⁶ Likewise, among another racially diverse sample of MSM, Irwin and Morgenstern found no differences in the reported use of opiates, cocaine, hallucinogens, or other drugs (i.e., ketamine, Ecstasy, γ -hydroxybutyrate).⁶¹ A separate study of 10 000 HIV-positive MSM reported that Black MSM were significantly less likely than non-Black MSM to use diazepam, hallucinogens, or nitrites.⁶⁰ In addition, the same study and 2 other studies^{61,62} found a lower prevalence of amphetamine use among Black MSM than among MSM of other races/ethnicities.

Black MSM are just as likely as or less likely than other MSM to consume alcohol. Except for 1 investigation,⁶¹ studies have found no differences among MSM of different races and ethnicities in the prevalence of

alcohol use,³³ alcohol-related problems,^{61,63} or alcohol use during sex.¹⁶ In addition, in random samples of young MSM, Black MSM have reported comparable⁶⁴ or lower^{20,59} rates of alcohol consumption and lower rates of substance dependence⁵⁹ than other MSM.

Studies of injection drug use by Black MSM have had somewhat mixed results. Injection drug use was found to be greater among Black MSM than among White MSM in 2 studies.^{36,60} However, 5 other studies found that Black MSM were equally as likely as or less likely than other MSM to report injection drug use.^{5,11,20,29,40} Similarly, Black MSM were equally as likely as⁵ or less likely than^{9,11} other MSM to report needle sharing.

Reports of drug use during sex also varied among racial groups of MSM. Although young Black MSM (aged 15 through 22 years) were less likely than other young MSM to report drug use during sex,¹¹ McKirnan et al.¹⁶ and Heckman et al.³³ found that older Black MSM were more likely than their non-Black peers to use drugs during sex.

Black MSM are significantly more likely than other MSM to report using noninjected crack cocaine. Sullivan and colleagues reported that Black MSM were 3 times as likely as White MSM to report crack cocaine use.⁶⁰ In a multiracial sample of MSM, 94% of all crack cocaine users were Black.¹⁶ A third study found that more Black MSM than White MSM used cocaine during sex,³³ but the authors did not differentiate between crack cocaine and powdered cocaine. Notably, there may be differences in crack cocaine use between younger and older Black MSM. Two studies using probability samples of young MSM found that young Black MSM were as likely as⁵⁹ or significantly less likely than¹¹ other young MSM to report having ever used crack cocaine.

To summarize, Black MSM are no more likely than other MSM to report drug or alcohol use. Crack cocaine is the only illicit drug that Black MSM report using more often than other MSM. It is not known whether high rates of crack cocaine use for Black MSM make a significant contribution to racial differences in HIV prevalence. Also, it is unclear whether Black MSM are more likely than other MSM to combine substance use and sex.

HYPOTHESES SUPPORTED BY THE SCIENTIFIC EVIDENCE

Hypothesis 4: Black MSM Are More Likely Than Other MSM to Contract Sexually Transmitted Diseases That Facilitate the Acquisition and Transmission of HIV

Sexually transmitted diseases (STDs) increase vulnerability to⁶⁵ and transmissibility of⁶⁶ HIV infection. Recent STD outbreaks have heralded increasing rates of high-risk sex among MSM in the United States.^{67–71} One of the notable aspects of the outbreaks among American MSM has been the high rate of HIV coinfection among men with a recent diagnosis of syphilis or gonorrhea.⁷² Although the reported outbreaks have primarily involved HIV-positive White MSM, racial comparative studies have documented greater STD coinfection in HIV-positive Black MSM than in other HIV-positive MSM.^{5,7} Among several thousand MSM in New York City who were tested for HIV, Torian et al. found that HIV-positive Black MSM were significantly more likely to be coinfecting with gonorrhea, syphilis, or nongonococcal urethritis than HIV-positive White MSM (60% vs 18%).⁷ Similarly, Easterbrook et al. reported that HIV-positive Black MSM were significantly more likely than HIV-positive White MSM to have syphilis, but there were no differences in urethral gonorrhea among seropositive MSM in their sample.⁵

STD rates are also higher for Black MSM than for other MSM regardless of HIV serostatus. Black MSM are more likely than other MSM to report ever having had an STD or currently having an STD.^{20,33,73} These findings are supported by recent STD surveillance data from the Centers for Disease Control and Prevention (CDC), which found that Black MSM were more likely than other MSM to report urethral chlamydia infection, urethral gonorrhea, and pharyngeal gonorrhea.⁷⁴ Studies have also found that proportionally more Black MSM than White MSM receive a diagnosis of or report a history of hepatitis B.^{5,16,75,76} Although the presence of hepatitis B itself does not contribute to HIV risk, infection with hepatitis B is a marker of HIV risk-related behaviors (e.g., unprotected sex or injection drug use). Four studies found

comparable STD prevalence rates^{5,29,77,78} across all racial/ethnic groups, and none of the studies we reviewed reported a lower prevalence of STDs among Black MSM than among other MSM.

To summarize, there is evidence that Black MSM are more likely than other MSM to report having an STD, which contributes to the observed racial differences in HIV disease burden.

Hypothesis 5: Black MSM Are Less Likely Than Other MSM to Be Tested for HIV or to Know Their HIV Status, and They May Unknowingly Expose Their Sexual Partners to HIV

Compared with other MSM, Black MSM are equally likely^{7,28,33,80} or more likely⁷⁹ to have ever been tested for HIV. One study found no racial differences among persons tested for HIV among 4000 MSM tested between 1990 and 1999 in New York City.⁷ Similar results were reported in 3 other studies,^{28,33,80} and an additional study found that Black MSM were significantly more likely than White MSM to report a history of HIV testing.⁷⁹ However, there is evidence that Black MSM are tested less frequently and later in their HIV infection than other MSM.

A recent multisite seroprevalence study reported that young Black MSM (aged 15–22 years) were tested for HIV less frequently than young White MSM.⁸¹ In addition, significantly more HIV-positive young Black MSM than HIV-positive young Latino or White MSM were unaware of their HIV infection (91%, 69%, and 60%, respectively).^{25,81} Similar results were found in another sample of young MSM.²⁹ However, high rates of unrecognized HIV infection are not limited to young Black MSM. In a multisite investigation that recruited older cohorts of MSM (aged 18–81 years), 64% of Black MSM, 18% of Latino MSM, and 11% of White MSM were unaware of their HIV infection.⁸⁰ Moreover, a separate study reported that a significantly greater proportion of HIV-positive Black MSM were tested later in their HIV infection (within 2 months to a year of AIDS diagnosis) than were their White peers.⁸²

To summarize, Black MSM are just as likely as other MSM to receive an HIV antibody test, but they are tested less frequently and are

less likely to be aware of their HIV-positive status than are other MSM. Men who are unaware of their HIV infection are more likely to engage in behaviors that may transmit the virus to HIV-negative partners than are men who know their positive status.⁸³ Infrequent or delayed HIV testing contributes to the high HIV prevalence among Black MSM.

HYPOTHESES FOR WHICH THERE IS INSUFFICIENT OR CONFLICTING SCIENTIFIC EVIDENCE

Hypothesis 6: Black MSM Are Genetically More Susceptible to HIV Than Other MSM

Individuals differ in their susceptibility to HIV infection. Some remain uninfected despite repeated exposure to HIV, and others become infected after a single exposure.⁸⁴ Several genetic and biological characteristics that affect susceptibility to HIV infection have been identified.^{85,86} If these characteristics were differentially distributed between racial or ethnic groups, they might contribute to differences in HIV incidence and prevalence rates for Black and other MSM. Of the potential genetic factors that may affect risk for HIV infection, CCR5 receptors, which are used by HIV to infect cells, have received the most attention. Persons who are homozygous for the CCR5 base 32 protein deletion do not express CCR5 receptors and are relatively rare in the general population (<1%).⁸⁷ Studies have confirmed that persons who are homozygous or heterozygous for the genetic mutation may be resistant to HIV infection.^{85–93} Among HIV-positive persons, the genetic mutation has also been associated with decreased viral load, less rapid progression of HIV disease, and increased survival.^{94–96}

Approximately 1% of Whites globally are homozygous for the genetic variant, and 15% are heterozygous (i.e., 1 CCR5 base 32 allele and fewer CCR5 receptors).⁸⁷ Fewer persons of African or Asian descent are homozygous (<0.1%) or heterozygous (<1%) for the CCR5 base 32 allele.^{97–99} The few studies that have examined the CCR5 mutation among MSM have failed to recruit sufficient samples of Black MSM to report stratified analyses by race.^{88–90,93} One study of MSM pointedly restricted analyses to White

participants because of the documented low prevalence of CCR5 base 32 deletion in non-White populations.⁹⁰

To summarize, there is insufficient information on the degree to which genetic factors affect HIV prevalence among Black MSM. The fact that CCR5 base 32 deletion occurs less frequently in populations of color⁹⁷ gives some credence to a genetic component for racial differences in HIV infection among MSM. However, Asian populations are just as unlikely as Black populations to express the genetic mutation,⁹⁷ but rates of HIV infection for Asian MSM in the United States remain significantly lower than those for Black MSM.¹

Hypothesis 7: Black MSM Are Less Likely Than Other MSM to Be Circumcised, Increasing Their Risk for HIV Infection

Circumcision is a cultural practice with biological consequences that may protect a man from HIV infection.^{100,101} Studies have found that in the United States, Black men are less likely than White men to be circumcised. Cook et al. reported that 76% of White men in a sample drawn from an urban STD clinic were circumcised, compared with 18% of Black men.¹⁰² Another study of nearly 8000 male patients at a US military clinic found that 85% of Whites and 34% of Blacks were circumcised.¹⁰³ Likewise, in a sample of 1410 men, Laumann et al. found that Black men in 2 of 3 age cohorts born between 1933 and 1973 were significantly less likely to be circumcised than were White men.¹⁰⁴ CDC data indicate that circumcision rates among newborn boys were 10% higher for Whites than for Blacks between 1979 and 1993 but that White and Black rates converged in the late 1990s.¹⁰⁵

Three studies have evaluated the role of circumcision in HIV infection in MSM.^{106–108} One small study found no association between circumcision and HIV infection¹⁰⁶; 2 studies found a protective effect associated with circumcision.^{107,108} None of the 3 studies stratified analyses by Black race, but 1 of the studies reported that non-White MSM collectively were less likely than White MSM to be circumcised.¹⁰⁷

The protective effect of circumcision alone cannot explain the disproportionately high

rates of HIV infection among Black MSM. Latino men in general are less likely to be circumcised than Black men.^{109,110} Assuming that Latino MSM are also less likely to be circumcised than Black MSM, HIV infection rates for Latino MSM should be higher than rates for Black MSM. But proportionally more Black MSM than Latino MSM in the United States have been diagnosed with HIV infection since the beginning of the epidemic (cumulatively, 30% vs 12%, respectively, and 27% vs 18%, respectively, in 2003 alone).¹

To summarize, there are insufficient data to evaluate the role that circumcision plays in HIV infection among Black MSM. Studies have found that White MSM are more likely than non-White MSM to be circumcised and that circumcised MSM are less likely than uncircumcised MSM to be HIV-positive, but there are no data specific to Black MSM.

Hypothesis 8: HIV-Positive Black MSM Are Infectious for a Longer Time Than Other HIV-Positive MSM

Black HIV-positive MSM may be infectious for a longer period of time than other HIV-positive MSM, contributing to greater opportunities for HIV transmission. Factors that influence the duration of infectiousness among HIV-positive Black MSM are (1) access to and use of medical care for HIV infection and (2) access and adherence to antiretroviral therapy (ART).

HIV-related medical care access and use. High viral load has been associated with a greater likelihood of transmitting HIV to sexual partners.¹¹¹ Inadequate health care access or suboptimal health care use by HIV-positive Black MSM may result in their having higher viral loads and, in turn, an increased likelihood of transmitting HIV to their sexual partners. Several quantitative studies have explored health care access and use by racially diverse samples of HIV-positive MSM. They found that HIV-positive Black MSM were as likely as HIV-positive White MSM to report having health insurance,^{112,113} including private health insurance.¹¹³ In addition, they found no differences among HIV-positive MSM of different racial/ethnic groups in terms of emergency department visits,^{113,114} inpatient visits,¹¹³ or recent hospitalizations.¹¹⁴

However, racial differences among MSM who accessed and used health care have been reported. HIV-positive Black MSM were significantly more likely than other MSM to receive care at public clinics¹¹² and less likely to discuss HIV-related concerns with a doctor or nurse.⁵² In addition, although 1 study found no differences in outpatient visits among MSM of different races,¹¹⁴ another study found racial differences in outpatient use according to CD4 count.¹¹³ White MSM with CD4 counts higher than 500 cells per cubic millimeter were 10 times as likely as Black MSM with comparable CD4 counts to report an outpatient visit during the past 6 months.¹¹³ No differences in use of outpatient services were found among HIV-positive MSM with more compromised immune systems (<500 cells per cubic millimeter), regardless of race.

ART access and adherence. ART decreases viral load and infectiousness in HIV-positive persons.¹¹⁵ If HIV-positive Black MSM were less likely than other HIV-positive MSM to have access to ART, it might explain the high HIV transmission rates among Black MSM.

In 3 studies, Black MSM reported less access to ART than other MSM.^{112,116,117} Jacobson et al. reported that HIV-positive Black MSM were less likely than HIV-positive men of other racial/ethnic groups to be taking ART.¹¹⁶ Halkitis and colleagues found less ART access among Black MSM at 1 of 2 project sites.¹¹² Likewise, Stall et al. found that a comparison group of Black and Latino MSM were less likely than White MSM to receive recommended levels of ART.¹¹⁷ However, a fourth study reported no differences in ART access among 307 HIV-positive MSM according to race/ethnicity.¹¹³

Viral load and HIV transmissibility are also influenced by adherence to ART regimens.¹¹⁸ Differences in ART adherence among HIV-positive MSM of different races and ethnicities could partially explain the disproportionately high rates of HIV infection among Black MSM. However, only 2 investigations of ART adherence that we reviewed stratified MSM by race, and the 2 studies differed in their results.^{112,119,120} In a longitudinal study of 539 HIV-positive MSM, Kleeberger and colleagues found that Black race was an independent predictor of

TABLE 1—Summary of Findings for Hypotheses Addressing Disproportionate HIV Prevalence and Incidence Among Black Men Who Have Sex With Men (MSM)

	Supportive Studies	Nonsupportive Studies
Hypotheses not supported by the scientific evidence		
1. Black MSM are more likely than other MSM to engage in high-risk sexual behavior.		
Black MSM have higher rates of unprotected anal intercourse than other MSM.	Bingman et al., 2001 ^{35,a} Gomez and Halkitis, 1998 ³⁴ Heckman et al., 1999 ³³ Linn et al., 1989 ³⁰ Peterson et al., 1992 ³¹	Bartholow et al., 2005 ^{26,a} Bingham et al., 2003 ^{29,a} Denning et al., 2005 ²⁷ Doll et al., 1990 ²² Harawa et al., 2004 ^{11,a} Lemp et al., 1994 ^{6,a} MacKellar et al., 2005 ^{25,a} Mansergh et al., 2002 ¹⁹ McKirman et al., 2001 ¹⁶ McKirman et al., 1995 ²⁸ Ostrow et al., 1991 ¹⁷ Peterson et al., 2001 ^{21,a} Purcell et al., 2005 ²³ Ruiz et al., 1998 ¹⁰ Samuel and Winkelstein, 1987 ⁹ Solorio et al., 2003 ²⁴ Stokes et al., 1996 ¹⁸ Valleroy et al., 2002 ^{20,a}
Black MSM have a larger number of male sexual partners than other MSM.	...	Bingham et al., 2003 ^{29,a} Doll et al., 1990 ²² Gomez and Halkitis, 1998 ³⁴ Harawa et al., 2004 ^{11,a} Heckman et al., 1999 ³³ Kramer et al., 1980 ³⁷ Samuel and Winkelstein, 1987 ⁹ Stokes et al., 1996 ¹⁸
Black MSM are more likely than other MSM to engage in commercial sex work.	McKirman et al., 1995 ²⁸	Harawa et al., 2004 ^{11,a} Heckman et al., 1999 ³³ Newman et al., 2004 ⁴¹ Rietmeijer et al., 1998 ⁴⁰
2. Black MSM are less likely than other MSM to identify as gay or to disclose their sexual identity, which may lead to increased HIV risk behavior.		
Black MSM are less likely than other MSM to be gay-identified.	Chu et al., 1992 ⁴⁴ Doll et al., 1992 ⁴⁵ Goldbaum et al., 1998 ^{46,a} Gomez and Halkitis, 1998 ³⁴ Kramer et al., 1980 ³⁷ McKirman et al., 1995 ²⁸ McKirman et al., 2001 ¹⁶ Montgomery et al., 2003 ⁴⁷ Torian et al., 2002 ⁷	Rietmeijer et al., 1998 ⁴⁰

Continued

nonadherence to ART at baseline¹¹⁹ and at 2-year follow-up.¹²⁰ However, no differences in ART adherence were found in a racially diverse sample of 463 HIV-positive MSM recruited from San Francisco and New York City.¹¹²

To summarize, the data for this hypothesis are mixed. Despite comparable health insurance coverage among HIV-positive MSM, HIV-positive Black MSM either do not have adequate access to preventive health care or use preventive health care services less optimally than other HIV-positive MSM. Moreover, HIV-positive Black MSM are less likely than other HIV-positive MSM to report access to ART. However, the available data on ART adherence among MSM of different races are inconclusive.

Hypothesis 9: Black MSM Are More Likely Than Other MSM to Have Sex With Partners Known to Be HIV Positive

A greater likelihood of having an HIV-positive sexual partner might explain the disparate rates of HIV prevalence. Three racially diverse studies of MSM have examined reports of sex with HIV-positive partners, but the data are mixed. In 1 study, Black MSM were more likely than White MSM to know or suspect that a recent male sexual partner was HIV-positive.³³ In 2 other studies, Black MSM were significantly less likely than other MSM to report having had sex with a man who was HIV positive.^{5,11} One of the 2 studies found no association among Black MSM between HIV-positive status and reported sex with an HIV-positive partner.⁵ The authors of the second study concluded that even if Black MSM had reported high rates of sex with partners known to be HIV positive, this still would not have accounted for the disparate rates of HIV infection.¹¹

To summarize, the contribution of this hypothesis to HIV infection rates among Black MSM is not known. Data from the 3 studies relevant to this hypothesis were limited because the studies required that participants know the HIV status of their sexual partners, but infected male sexual partners of study participants could have been unaware of or reluctant to disclose their HIV-positive status.

TABLE 1—Continued

Black MSM are less likely than other MSM to disclose their sexuality to others.	Kenamer et al., 2000 ⁴⁹ Mason et al., 1997 ^{52,a,b} McKirman et al., 1995 ²⁸ CDC, 2003 ^{50,a} Ostrow et al., 1991 ¹⁷ Simoni et al., 1997 ^{51,a} Stokes et al., 1996 ⁴⁸	Mason et al., 1997 ^{52,b}
Nongay identity among Black MSM is associated with high-risk sex.	...	Crawford et al., 2002 ⁵⁴ Hart and Peterson, 2004 ^{53,a}
Nondisclosure of sexuality among Black MSM is associated with high-risk sex.	Peterson et al., 1992 ³¹	Crawford et al., 2002 ⁵⁴ CDC, 2003 ^{50,a}
3. Black MSM are more likely than other MSM to abuse substances, especially injection drugs, that increase their risk for HIV infection.		
Black MSM are more likely than other MSM to use drugs.	...	Halkitis et al., 2005 ⁶² Harawa et al., 2004 ^{11,a} Irwin et al., 2005 ^{61,a} McNall et al., 1999 ^{59,a} Siegel et al., 2004 ³⁶ Sullivan et al., 1998 ⁶⁰ Torian et al., 2002 ⁵⁸ Valleroy et al., 2002 ^{20,a}
Black MSM are more likely than other MSM to use or abuse alcohol.	Irwin et al., 2005 ^{61,a,c}	Greenwood et al., 2002 ^{64,a} Heckman et al., 1999 ³³ Irwin et al., 2005 ^{61,a,c} McKirman et al., 2001 ¹⁶ McNall et al., 1999 ^{59,a} Stall et al., 2001 ^{63,a} Valleroy et al., 2002 ^{20,a}
Black MSM are more likely than other MSM to use injection drugs.	Siegel et al., 2004 ³⁶ Sullivan et al., 1998 ⁶⁰	Bingham et al., 2003 ^{29,a} Easterbrook et al., 1993 ⁵ Harawa et al., 2004 ^{11,a} Rietmeijer et al., 1998 ⁴⁰ Valleroy et al., 2002 ^{20,a}
Black MSM are more likely than other MSM to use drugs during sex.	McKirman et al., 2001 ¹⁶ Heckman et al., 1999 ³³	Harawa et al., 2004 ^{11,a}
Black MSM are more likely than other MSM to use crack cocaine.	Heckman et al., 1999 ^{33,d} McKirman et al., 2001 ¹⁶ Sullivan et al., 1998 ⁶⁰	McNall et al., 1999 ^{59,a}
Hypotheses supported by the scientific evidence		
4. Black MSM are more likely than other MSM to contract sexually transmitted diseases that facilitate the acquisition and transmission of HIV.	CDC, 2002 ⁷⁴ Easterbrook et al., 1993 ^{5,e} Heckman et al., 1999 ³³ Landrum et al., 1988 ⁷³ MacKellar et al., 2001 ^{75,a,f} McKirman et al., 2001 ¹⁶ Ostrow et al., 1999 ⁷⁶ Torian et al., 2002 ⁷ Valleroy et al., 2002 ^{20,a}	Easterbrook et al., 1993 ^{5,e} Bingham et al., 2003 ^{29,a} Geisler et al., 2002 ⁷⁷ Kim et al., 2003 ⁷⁸

Continued

Hypothesis 10: The Sexual Networks of Black MSM Place Them at Greater Risk for HIV Infection Than the Sexual Networks of Other MSM

Sex between members of different populations (sexual mixing) facilitates the spread of sexually transmitted disease.^{121–123} Research has found that young MSM whose male sexual partners are older are more likely to be HIV-positive than young MSM whose male sexual partners are closer to their own age.¹²⁴ Several studies have suggested, but not empirically determined, that the sexual networks of Black MSM increase their likelihood of HIV infection.^{5,10,11,125} Only 1 published study tested the effect of sexual mixing on HIV infection among Black MSM. Data from more than 400 young MSM (aged 23–29 years) indicated that proportionally more Black MSM were HIV positive than were MSM of any other racial/ethnic group.²⁹ The authors also found that racial differences in partner selection partially explained elevated rates of HIV infection for Black MSM. Black MSM were more likely than other MSM to report having anal sex with Black male sexual partners, and they were significantly more likely than White MSM to report having anal sex with a male partner of a different age group (younger or older). More important, the relative odds of HIV infection among Black MSM decreased by 20% after the authors adjusted for older sexual partners and anal sex with Black partners in multivariate analyses.

To summarize, the data provided by the single available study are strong, and their value is limited only by the lack of additional studies with which to properly evaluate this hypothesis. Regardless of whether Black MSM know their partners' HIV status, the sexual networks and sexual mixing patterns of Black MSM likely contribute to the disproportionately high rates of HIV infection among these men.

Hypothesis 11: Black MSM Are More Likely Than Other MSM to Be Incarcerated, Which Increases the Likelihood of Exposure to HIV

It has been widely speculated that high HIV infection rates among Black MSM are partly because of high incarceration rates for Black men and subsequent homosexual

TABLE 1—Continued

5. Black MSM are less likely than other MSM to be tested for HIV or know their HIV status, and may unknowingly expose their sex partners to HIV.		
Black MSM are less likely than other MSM to have been tested for HIV.	...	Dao et al., 1999 ⁷⁹ Heckman et al., 1999 ³³ McKirnan et al., 1995 ²⁸ CDC, 2005 ^{80,a} Torian et al., 2002 ⁷
Black MSM are tested for HIV less frequently than other MSM.	CDC, 2002 ^{81,a}	...
Black MSM are more likely than other MSM to have unrecognized HIV infection.	Bingham et al., 2003 ^{29,a} MacKellar et al., 2005 ^{25,a} CDC, 2002 ^{81,a} CDC, 2005 ^{80,a}	...
Black MSM are more likely than other MSM to be diagnosed with HIV late in the disease's progression.	Wortley et al., 1995 ⁸²	...
Hypotheses for which there is insufficient or conflicting scientific evidence		
6. Black MSM are genetically more susceptible to HIV than other MSM (Black MSM are less likely to have the CCR5 base 32 allele)
7. Black MSM are less likely than other MSM to be circumcised, increasing their risk for HIV infection.
8. HIV-positive Black MSM are infectious for a longer time than other HIV-positive MSM.		
HIV-positive Black MSM are less likely than other MSM to have health insurance.	...	Halkitis et al., 2003 ¹¹² Kass et al., 1999 ¹¹³
HIV-positive Black MSM are less likely than other MSM to have access to health services.	Kass et al., 1999 ^{113,g}	Kass et al., 1999 ^{113,g} Zucconi et al., 1994 ¹¹⁴
HIV-positive Black MSM are less likely than other MSM to discuss HIV-related concerns with their health care providers.	Mason et al., 1997 ⁵²	...
HIV-positive Black MSM are less likely than other MSM to be receiving antiretroviral therapy.	Halkitis et al., 2003 ¹¹² Jacobson et al., 2001 ¹¹⁶ Stall et al., 2001 ^{117,a}	Kass et al., 1999 ¹¹³
HIV-positive Black MSM are less likely than other MSM to adhere to antiretroviral therapy medication regimens.	Kleeberger et al., 2001 ¹¹⁹ Kleeberger et al., 2004 ¹²⁰	Halkitis et al., 2003 ¹¹²
9. Black MSM are more likely than other MSM to have sex with partners known to be HIV positive.	Heckman et al., 1999 ³³	Easterbrook et al., 1993 ⁵ Harawa et al., 2004 ^{11,a}
10. The sexual networks of Black MSM place them at greater risk for HIV infection than the sexual networks of other MSM.	Bingham et al., 2003 ^{29,a}	...
11. Black MSM are more likely than other MSM to be incarcerated, which increases the likelihood of exposure to HIV.		
Black MSM are more likely than other MSM to have a history of incarceration.	Valleroy et al., 2002 ^{20,a}	Bingham et al., 2003 ^{29,a}
Black MSM have higher rates of participation in anal sex while incarcerated than outside correctional facilities.	...	Wohl et al., 2000 ¹³⁸

Continued

contact while in prison.^{126–128} Adequate circumstantial evidence supports these speculations. Black men represent the largest proportion of all incarcerated men in federal and state prisons¹²⁹ and the largest proportion of HIV-infected men in jails and state and federal prisons.¹³⁰ In addition, homosexual contact¹³¹ and STD and HIV^{132–135} outbreaks have been documented among men in protective custody settings, the HIV infection rate is 5 times higher in prisons than in the general population,¹³⁶ and fewer than 1% of correctional facilities nationally permit the distribution of latex condoms.¹³⁷

Despite these data, few studies of MSM have explored racial differences in incarceration history and HIV infection. Disparate results were reported in 2 studies of young MSM. One study found no racial differences in reported incarceration history,²⁹ while the other found that young Black MSM were significantly more likely than other young MSM to report a history of incarceration.²⁰ Neither study tested for associations between incarceration history and HIV status. However, a third study tested the association between incarceration and HIV status among Black men in Los Angeles, Calif. Among men who had been incarcerated, 23% of case subjects and 9% of control subjects reported having had anal sex while in jail, prison, or a detention center.¹³⁸ When the researchers controlled for anal sex while not incarcerated, men who reported having anal sex during incarceration were not at greater risk for HIV infection. In fact, the men reported having had significantly more anal intercourse with male sexual partners outside rather than inside penal institutions (45% vs 16%, respectively). However, the men also reported greater condom use during anal sex outside rather than inside penal institutions (90% vs 42%, respectively), and a greater proportion of case subjects than control subjects reported that they were always the receptive partner during anal sex while incarcerated (43% vs 18%).

To summarize, Black MSM are more likely than other MSM to report a history of incarceration. However, the single study to date that tested the association between imprisonment and HIV infection among Black MSM found no association. There is a dearth of

TABLE 1—Continued

Black MSM are more likely to use condoms during anal sex outside rather than inside correctional facilities.	Wohl et al., 2000 ¹³⁸	...
HIV infection is associated with a history of incarceration among Black MSM.	...	Wohl et al., 2000 ¹³⁸
12. Black MSM are more likely than other MSM to engage in anorectal douching, which increases their risk for HIV infection.	Easterbrook et al., 1993 ⁵	...

Note. CDC = Centers for Disease Control and Prevention. A study was supportive of a hypothesis when findings were significant ($P \leq .05$) in the direction of the hypothesis; a study was nonsupportive of a hypothesis when no statistical difference was reported or the findings were significant ($P \leq .05$) in the opposite direction from the hypothesis.

^aSubjects were randomly recruited MSM.

^bMason et al.⁵² found that, compared with other HIV-positive MSM, HIV-positive Black MSM were less likely to disclose their sexuality to health care providers (supportive evidence) but as likely to disclose their sexuality to parents and lovers (nonsupportive evidence).

^cIrwin et al.⁶¹ found that Black MSM reported consuming a significantly higher number of drinks per day than other MSM (supportive evidence), but they found no differences among MSM of various races in problem drinking (nonsupportive evidence).

^dAuthors did not distinguish between crack cocaine and powdered cocaine.

^eEasterbrook et al.⁵ found that HIV-positive Black MSM were significantly more likely than HIV-positive White MSM to have syphilis (supportive evidence), but they found no differences in urethral gonorrhea among HIV-positive MSM in their sample (nonsupportive evidence).

^fIn MacKellar et al.,⁷⁵ Asian MSM had the highest prevalence of hepatitis B infection, followed by Black MSM. White MSM had the lowest prevalence of hepatitis B infection.

^gKass et al.¹¹³ found that, compared with other HIV-positive MSM, HIV-positive Black MSM were less likely to use outpatient services (supportive evidence) but equally likely to have private health insurance, to have made emergency visits, to have made inpatient visits, and to have had recent hospitalizations (nonsupportive evidence).

studies that would allow us to properly evaluate this hypothesis.

Hypothesis 12: Black MSM Are More Likely Than Other MSM to Engage in Anorectal Douching, Which Increases Their Risk for HIV Infection

Although the use of nonoxynol-9 in the anal cavity has been associated with the exfoliation of rectal epithelial cells,^{139,140} the degree to which douching, or rinsing out the anal cavity with water or a water-based solution, affects anal tissue is not known.¹⁴¹ Scientific investigations have examined vaginal douching more commonly than anal douching,¹⁴² and vaginal douching has been related to STD acquisition.¹⁴³ But vaginal mucosa are different from anal mucosa.¹⁴¹ Some have suggested that the probability of HIV acquisition or transmission may be greater during anal sex than during vaginal sex because rectal tissue is more prone to abrasion during penetration.^{144,145}

Only 2 studies of MSM have examined associations between anorectal douching and HIV infection. One found that, compared with MSM who did not report douching,

MSM who engaged in anorectal douching were 5 times as likely to be HIV positive¹⁴⁶; however, the authors did not stratify the analyses by race. The second study, which did stratify by race, found that Black MSM were significantly more likely than other MSM to report anorectal douching.⁵ Additionally, compared with Black MSM who did not report anorectal douching, Black MSM who did were significantly more likely to be HIV positive.

To summarize, Black MSM are significantly more likely than other MSM to report anorectal douching, and studies have found associations between anorectal douching and HIV-positive status among Black MSM. However, there are too few studies to permit evaluation of this hypothesis.

CONCLUSIONS

The results of our literature review are summarized in Table 1. Partial explanations for the disproportionate HIV rates for Black MSM, in comparison with other MSM, were supported by 2 hypotheses. First, compared with other MSM, Black MSM are more likely

to report having had an STD in the past or to have a current diagnosis of STD. The presence of an STD makes Black MSM more susceptible than other MSM to acquisition and transmission of HIV. Second, Black MSM are less likely than other MSM to know their HIV status and to be tested for HIV early in the progression of their disease. Likewise, rates of unrecognized HIV infection are greater among Black MSM than other groups of MSM.

Three hypotheses were not supported by the available data. The studies we reviewed showed that, contrary to popular belief, Black MSM do not engage in more HIV risk behavior than other MSM, and that, among Black MSM, HIV risk behavior is not associated with nongay identity but may be inversely related to nondisclosure of sexual identity. In addition, the preponderance of evidence to date has not shown that Black MSM engage in greater rates of substance use than other MSM.

The available studies neither supported nor refuted 7 hypotheses. However, it should not be assumed that these factors fail to contribute to differences in HIV infection rates between Black MSM and MSM of other races/ethnicities. Despite the absence of data, it is unlikely that known biological factors that prevent HIV infection (e.g., CCR5 or circumcision) operate differently among Black MSM than in the general population of Black men, but additional research is needed to gauge the extent to which structural factors (e.g., sexual networks, health care access, incarceration) and behavioral factors (e.g., having sex with known HIV-positive partners, anorectal douching) contribute to disproportionately high HIV infection rates among Black MSM. The high background prevalence of HIV and the sexual mixing patterns of Black MSM might make several of these factors more central to HIV transmission among Black MSM than among MSM of other races/ethnicities.

Future studies should resolve the discrepancy between low self-reported sexual risk behavior and high STD prevalence among Black MSM. Only 2 studies have examined social desirability bias among MSM,^{11,30} and no studies of MSM have used standardized

measures, such as the Marlowe–Crowne scale,¹⁴⁷ to explore differences in socially desirable responses. Future studies should also investigate the role of sociocultural factors (e.g. racial discrimination, homophobia, and stigmatization) in the disparate rates of HIV infection among MSM.¹⁴⁸

There are limitations to our review. First, there have been very few studies designed to examine HIV risk exclusively among Black MSM. Most studies cited in this review recruited comparatively small samples of Black MSM within larger studies comprising mostly White MSM. Second, few of the studies cited were designed to directly test the presented hypotheses. Third, this review is largely qualitative and did not involve a meta-analysis of the studies cited for our hypotheses.

The human toll experienced by Black MSM as a consequence of HIV infection warrants increased research efforts that are specifically designed to identify the underlying causes of the AIDS epidemic among Black MSM. Our findings support the need for effective structural interventions that reduce HIV risks at the community level through better access to and utilization of STD and HIV detection and treatment. ■

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Contributors

All authors contributed to the development of the hypotheses examined, decisions about the rejection or acceptance of a given hypothesis on the basis of the evidence from the review, and provided feedback on successive drafts of the article. G.A. Millett gathered the applicable literature for each hypothesis, compiled and edited all sections of the article, and was responsible for the overall supervision of the article.

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