

# Understanding Structural Barriers to Accessing HIV Testing and Prevention Services Among Black Men Who Have Sex with Men (BMSM) in the United States

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Published online: 15 February 2014  
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**Abstract** Structural-level factors have contributed to the substantial disproportionate rates of HIV among Black men who have sex with men (BMSM) in the United States. Despite insufficient HIV testing patterns, however, there is a void in research investigating the relationship between structural factors and access to HIV testing and prevention services among BMSM. Building on previous scholarly work and incorporating a dynamic social systems conceptual framework, we conducted a comprehensive review of the literature on structural barriers to HIV testing and prevention services among BMSM across four domains: healthcare, stigma and discrimination, incarceration, and poverty. We found that BMSM experience inadequate access to culturally competent services, stigma and discrimination that impede access to services, a deficiency of services in correctional institutions, and limited services in areas where BMSM live. Structural interventions that eliminate barriers to HIV testing and prevention services

and provide BMSM with core skills to navigate complex systems are needed.

**Keywords** Black men who have sex with men · HIV · HIV testing · Structural barriers · Healthcare services · Stigma · Incarceration · Poverty · Prevention

## Introduction

High HIV infection rates among Black men who have sex with men (BMSM) in the United States (US) remain a major public health crisis. A 2008 surveillance study in 21 cities estimated HIV prevalence among BMSM to be 28 %, compared with 18 % among Latino men who have sex with men (MSM) and 16 % among non-Latino White MSM [1]. A more recent study of BMSM in six US cities reported an HIV prevalence of 21 % [2] and a yearly HIV incidence rate of 3.0 % [3]. While the generalizability of these results is limited, they underscore the severity of the epidemic among subpopulations of BMSM in highly populated urban areas. In 2010, an estimated 134,746 of BMSM in the US were living with diagnosed HIV infection, and BMSM accounted for more than 20 % of total new infections [4]. Rates of new infections among BMSM, aged 13–30, have been particularly alarming, with yearly incidence estimates ranging from 5.1 to 6.4 % [3–5]. Although rates of new HIV infections remained stable from 2006 to 2009 among other racial and ethnic groups of MSM aged 13–29, there was a 48 % increase in new HIV infections among young BMSM during this time period [1, 6].

Structural-level factors, which include the socio-economic and -cultural contexts of communities, have contributed to the high burden of HIV among BMSM. Based on the work of Latkin et al. [7], structural factors can be

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defined as forces that work outside the individual and beyond the individual's control to foster or impede health or health behaviors, and they often distally impact health outcomes in diffuse and indefinite ways. Although a multiplicity of factors contribute to each individual's risk of HIV infection, there is a growing body of literature recognizing that structural-level factors have served a primary role in shaping the epidemic [5, 7–23]. For example, Peterson and Jones [13] described the effects of structural factors—including stigma, racism, barriers to healthcare, and incarceration—on HIV risk among BMSM, and discussed the need for structural interventions to reduce HIV-related racial disparities. Mays et al. [16] provided recommendations to move the HIV prevention research agenda for BMSM toward a social/interpersonal focus that addresses social-structural barriers contributing to HIV infection. More recently, Millett et al. [12] discussed the inability to eliminate disparities in HIV infection among BMSM without addressing structural barriers such as low income, incarceration, unemployment, and low education.

Building on this formative research, Latkin et al. introduced a dynamic social systems theoretical model that provides a framework for better understanding the complex processes by which structural factors drive the elevated rates of HIV infection among BMSM. Emphasizing the social nature of structural factors within the scope of HIV prevention research, the authors' model conceptualizes structural factors across three core dimensions encompassing: (1) resources, (2) social influence and control factors, and (3) contextual factors [7]. Resources involve economic, social, cultural, and infrastructural resources (e.g., staffing and equipment at HIV testing sites), and can also include scientific knowledge and technological innovations related to HIV prevention (e.g., research on rapid HIV testing technologies). Social influence and control factors include non-institutionally sanctioned social influence (e.g., social norms) as well as institutionally sanctioned social influence (e.g., decision rules to recommend HIV testing to certain individuals). Resources and social influence can be considered forms of power, and they operate through contextual factors, including the structure of social relationships (e.g., relationships between clients and staff at HIV testing sites) and geographic, spatial, or social boundaries (e.g., local availability of HIV testing sites) [7]. Each element in the model can influence and be influenced by other elements, reflecting the interdependent and dynamic nature of structural factors. Furthermore, each of the dimensions of structural factors can operate on macro (i.e., socio-political, economic, and cultural contexts and the social institutions that shape social organizations with the broadest reach), meso (i.e., systems within more immediate institutions in which individuals and groups are involved), and micro (i.e., immediate social and physical

contexts in which interactions among individuals and small groups take place) levels of society [7]. Specific structural factors may function at a variety of levels, depending on the perspective and specific question of the observer [7]. Given that structural factors are correlates of HIV risk among BMSM [8, 12, 13], employing this model to conceptualize structural factors across these multi-level structural dimensions provides for a systematic and theoretically grounded approach to investigate the complex processes underlying their substantial contribution to the disproportionate HIV infection rates among BMSM. Since HIV prevention research examining the mechanisms by which structural factors impede prevention efforts for BMSM is understudied, a more comprehensive review rooted in this dynamic social systems model is warranted.

Moreover, a major limitation of the growing body of HIV prevention research investigating structural factors among BMSM involves the lack of focus on barriers to accessing HIV testing and HIV prevention services [24]. BMSM report irregular HIV testing patterns [10, 25] despite recommendations issued by the CDC that sexually active MSM should be tested at least once annually and that high-risk MSM be tested every 3–6 months [26]. Only 67 % of HIV-negative BMSM in one study were tested for HIV in the last 2 years [27] and only 52 % in another study were tested in the last year [28]. Other findings highlight the heterogeneity of HIV testing patterns among BMSM [29]. HIV-infected BMSM are also less likely than other HIV-infected MSM to be aware of their positive serostatus [10, 30–32]. One study reported that 59 % of HIV-infected BMSM in 21 cities were unaware of their positive serostatus [1], and another study reported that 14.5 % of BMSM who had been tested for HIV in the past 12 months were unaware that they were HIV-positive, compared with 6.7 % of Latino MSM and 3.0 % of non-Latino White MSM [32]. Being unaware of one's own positive HIV status increases the likelihood of HIV transmission risk behaviors [33], which may partially explain the higher HIV prevalence among sexual networks of BMSM [13, 19, 30, 34–36]. Compared to HIV-infected non-Latino White MSM, HIV-infected BMSM are also less likely to attain viral suppression and a high CD4 count [12] and more likely to have sexually transmitted co-infections [10–12, 37], both of which increase the risk of HIV transmission [38, 39]. Since limited healthcare access and other structural factors are associated with HIV infection risk among BMSM [8, 12, 13], these findings point to a potential relationship between structural factors and the use of HIV testing and prevention services [i.e., HIV counseling, HIV education, and the provision of pre-exposure prophylaxis (PrEP) or post-exposure prophylaxis (PEP)]. For instance, BMSM who are unable to access optimal healthcare services in their communities may experience barriers to

getting tested, learning their HIV status, receiving pre- and post-test HIV counseling, and consequently altering behaviors to prevent HIV acquisition or transmission. While formative research has investigated the risk of HIV infection associated with healthcare access, racism, homophobia, stigma, incarceration, low income, unemployment, and low education [8, 12, 13, 16], the roles of these structural factors as barriers to HIV testing and prevention services among BMSM are unclear.

Building on previous scholarly work and incorporating a dynamic social systems conceptual framework, we conducted a review of the literature on structural barriers to accessing HIV testing and prevention services among BMSM across the domains of healthcare, stigma and discrimination, incarceration, and poverty. Notwithstanding varied or unclear definitions of structural factors across the body of literature pertaining to BMSM, this paper utilizes the definition and conceptual framework developed by Latkin et al. in reviewing articles, regardless of how authors defined or conceptualized structural factors. Furthermore, while structural factors may also act as facilitators to accessing HIV testing and prevention services—particularly as related to resiliency factors (e.g., social support, spirituality) [40–42]—for the scope of this paper we only assessed their roles as barriers to services. Given the strong focus of HIV prevention research among BMSM on structural factors as barriers to services, this review attempts to draw on the available literature to identify strategic points of intervention to provide BMSM with core skills to overcome barriers to services. Though literature on resiliency factors among BMSM is more limited, this is also a crucial area of future investigation. Through critical examination of articles using this conceptual framework, this review aims to describe the roles of healthcare, stigma and discrimination, incarceration, and poverty as structural barriers to HIV testing and prevention services among BMSM.

## Methods

We searched two online databases (*PubMed* and *Scopus*) for peer-reviewed literature on structural barriers to HIV testing and prevention services among BMSM. We conducted the search in several stages using a comprehensive set of relevant key words and Medical Subject Heading, MeSH terms (“Appendix 1” section). First, we searched for articles pertaining to Black populations and cross-referenced those with articles pertaining to sexual identity or behavior applicable to MSM. Next, we cross-referenced these results with articles obtained from five additional searches. Four of the additional searches obtained articles related to each of four domains corresponding with

structural factors that have been researched in the literature: (1) healthcare, (2) stigma and discrimination, (3) incarceration, and (4) poverty. The remaining, additional search cross-referenced articles on HIV and those related to structural factors in general. Excluding duplicates, the search returned a total of 1,019 articles. We used the following criteria to determine which articles would be included in this review: (1) articles written in English, (2) articles published before 7 June 2013, (3) articles that reported quantitative or qualitative data collected from a sample or subsample of BMSM in the US, and (4) articles that reported data on exposures or outcomes related to structural factors. We also reviewed articles meeting inclusion criteria that were cited as references within these articles. In total, we reviewed 98 articles and extracted information across each of the four aforementioned domains.

## Results

### Healthcare

#### *Access to Healthcare Services*

There is insufficient evidence to determine the extent to which economic and infrastructural resources affect access to healthcare services among BMSM. One study that assessed types of insurance coverage among BMSM, which operates as a structural factor across macro and meso levels of economic resources (Table 1), found that 79.2 % reported coverage by public insurance, 20.8 % reported coverage by private insurance, and 4.6 % reported no insurance coverage [27]. However, these results have limited generalizability due to the use of a modified respondent-driven sampling method. By contrast, 19.0 % of Blacks in the US, compared with 11.1 % of non-Latino Whites, reported not having health insurance coverage in 2012 [43]. Demonstrating that HIV-positive BMSM face particular challenges to acquiring health insurance, two studies found that HIV-positive BMSM were less likely than HIV-positive MSM of other races/ethnicities to report having health insurance [12] and less likely than HIV-negative BMSM to report having health insurance or a primary healthcare provider [44]. Furthermore, a qualitative study conducted among different subgroups of Black men—which included a focus group consisting of solely BMSM—provides some evidence that BMSM have experienced barriers to accessing healthcare services related to meso-level economic resources required for visits and inadequate micro-level infrastructural resources of healthcare facilities [45] (Table 1). All groups identified high perceived costs and low perceived benefits of healthcare

**Table 1** Structural barriers to HIV testing and prevention services among BMSM

| Structural dimension [7]           | Key findings  |
|------------------------------------|---|
| Material resources and allocations | <p><i>Many BMSM lack health insurance coverage.</i> One study found that 4.6 % of BMSM reported no insurance coverage [27], but its results have limited generalizability. The percentage without health insurance may be more similar to the 19.0 % of Blacks in the US that report not having health insurance coverage [43]. HIV-positive BMSM report less insurance coverage compared to HIV-positive MSM of other races/ethnicities [12]</p> <p><i>Some BMSM report high perceived costs and low perceived benefits of healthcare visits.</i> Due to the high costs of quality medical care combined with the expense of taking time from work for visits, primary healthcare is viewed by some as optional except in cases of urgent medical need [45]</p> <p><i>HIV testing and prevention services are not widely accessible in correctional facilities.</i> Rates of incarceration among BMSM are disproportionately high. Despite HIV prevalence rates that are approximately five times greater in prisons, only 20 states test all inmates for HIV at admission or while in prison, and only three states test them upon release [147]. In one state, only 31 % of male prisoners received a voluntary HIV test upon admission and many inmates were unaware of their status [148]. The provision of HIV prevention services including instructor-led educational modules, peer education programs, and HIV prevention case management is inconsistent [146, 149, 150]. Prisoners also experience a lack of condom availability [151], as only two state prison systems and five city/county jail systems in the US make condoms available to male inmates [152, 153]</p>   |
| Science and technology             | N/A   |
| Informal social influences         | <p><i>BMSM experience racism and homophobia during visits with healthcare and HIV prevention service providers.</i> Many physicians express negative attitudes toward MSM [49, 50]. HIV prevention service providers' attitudes toward BMSM are affected by ambivalent or negative beliefs that pervade the general community, and BMSM who cannot access nonjudgmental, comfortable testing environments are less likely to use HIV testing [14, 109, 112]</p> <p><i>BMSM experience barriers to disclosing sexual behavior to healthcare providers.</i> Having expressed concerns pertaining to issues of confidentiality, discrimination, comfort, distrust, and conspiracy beliefs [55–60], BMSM are less likely than other MSM to disclose their sexual behavior or identity to healthcare providers [53, 61, 62]. Demonstrating the importance of an open and supportive patient–provider relationship, MSM who disclose their sexual behavior to their healthcare provider are more likely to discuss HIV/AIDS, disclose their HIV status, accurately report unprotected anal intercourse, and get tested [44, 53, 62]</p> <p><i>Experiences of stigma and discrimination in the general community are associated with negative mental health outcomes, which can hinder BMSM from accessing HIV prevention services.</i> Stigma and discrimination can result in negative mental health outcomes, including depression and lower self-esteem [90, 96, 101, 112, 125, 126], and poor mental health can inhibit BMSM from voluntarily using HIV testing and prevention services [60, 90, 111, 112]. One study found that experiences of homophobia and racism in Black and LGBT communities, respectively, may lead to a psychological displacement that decreases the use of services and negatively affects open communication with healthcare providers [60]. Two studies found that racism and homophobia hindered the motivation of BMSM to access HIV prevention information [111, 112], and another found that those who had a less positive self-identification of being Black and gay reported lower HIV prevention self-efficacy [90]</p> <p><i>Voluntary HIV testing is stigmatized.</i> Voluntary HIV testing and use of HIV prevention services often involve the disclosure of stigmatized sexual behavior, such as having same-sex, anonymous, or multiple sexual partners [114–116], which can impede BMSM from using these services [58, 110]. If BMSM are perceived to be HIV-positive, they may experience stigma due to HIV status [101, 117–121], sometimes leading to a fear of diagnosis and further hindering the use of prevention services [58]</p> |
| Formal social control mechanisms   | <p><i>Many healthcare providers lack cultural competency related to sexual identities of BMSM.</i> Many healthcare providers lack awareness of sexual identities and behaviors and fail to recognize the importance of discussing sexual health with patients as a routine component of medical care [51–54]. Among MSM in one study who had healthcare providers who were aware of their sexual behavior, only 59 % had received recommendations for HIV testing [53]</p>  |
| Social interconnectedness          | <p><i>Experiences of stigma and discrimination operate as barriers to HIV testing and prevention services through relationships and social interactions with healthcare providers and members of social networks</i></p>  |
| Settings                           | <p><i>BMSM live in areas with the lowest density of HIV prevention services.</i> One study found that HIV prevention services in one city were located primarily in areas most affected by HIV in the earlier years of the epidemic, with a deficiency of services in Black communities where most young BMSM lived and reported the highest rates of unprotected anal intercourse [154]</p>  |

*BMSM* Black men who have sex with men, *MSM* men who have sex with men

visits as reasons for accessing healthcare more frequently for urgent health concerns as opposed to preventive care [45]. Primary healthcare may be viewed by some as

optional, except in cases of urgent medical need, due to the high expense of quality medical care combined with the expense of taking time from work for visits [45]. However,

**Table 2** Studies of healthcare and HIV services in BMSM

| Authors, references    | Locations                                     | Study samples  | Study design    | Key findings   |
|------------------------|---|--|-----------------|--|
| Behel et al. [28]      | Baltimore, Dallas, Los Angeles, New York City | Analyses were conducted for 458 Black and 906 White MSM        | Cross-sectional | <p>(1) There were no differences between BMSM and White MSM in use of a HCP, visiting a HCP five or more times since the age of 20, previously testing for HIV, testing for HIV five or more times, and testing for HIV in the past 12 months</p> <p>(2) BMSM were more likely than White MSM to receive any (AOR = 2.2, 95 % CI [1.42, 3.26]) or all (AOR = 2.5, 95 % CI [1.72, 3.71]) of five HIV prevention services at their HCP and to be satisfied with the services they received (AOR = 1.7, 95 % CI [1.14, 2.65])</p> <p>(3) BMSM were more likely than White MSM to report testing for HIV at health departments (<math>p = 0.0419</math>) and hospitals (<math>p &lt; 0.0001</math>), and were equally as likely to report testing at a private MD compared to all other testing facilities (<math>p = 0.8535</math>)</p> <p>(4) Compared with White MSM, BMSM were more likely to increase the frequency of asking their partners' HIV status (<math>p &lt; 0.0001</math>) and to report decreasing their number of different sex partners as a result of their last HIV counseling and testing experience (<math>p = 0.0003</math>)</p> <p>(5) HIV-positive unaware BMSM were as likely as White MSM to report having tested HIV-negative in the past year (<math>p = 0.9976</math>), and among those who had tested, BMSM were more likely to report that their counselor explained HIV/AIDS (<math>p = 0.03</math>), asked about condom use (<math>p = 0.03</math>), talked about risk reduction (<math>p = 0.02</math>), talked about retesting (<math>p = 0.02</math>), and discussed talking to their partner about test results (<math>p = 0.04</math>)</p> |
| Bernstein et al. [62]  | New York City                                 | 452 MSM in NHBS  | Cross-sectional | <p>(1) BMSM were less likely than White MSM to have disclosed their sexuality to their HCP (AOR = 0.28, 95 % CI [0.14, 0.53])</p> <p>(2) MSM who had ever been tested for HIV were more likely to have disclosed their sexuality to their HCP (AOR = 2.10, 95 % CI [1.01, 4.38])</p>   |
| CDC [32]               | 21 Cities                                     | 7,271 MSM in NHBS who did not previously test positive for HIV | Cross-sectional | 61 % (95 % CI [58, 63]) of BMSM reported testing for HIV in the last 12 months, and the proportion of those who reported testing in the last 12 months did not differ by race/ethnicity  |
| Dombrowski et al. [84] | King County, WA                               | 501 Previously diagnosed HIV-positive MSM                      | Cohort          | BMSM were as likely to be on ART as White MSM (RR = 1.05, 95 % CI [0.77, 1.45])  |
| Dorell et al. [44]     | Jackson, MS                                   | 30 HIV-positive and 95 HIV-negative young BMSM                 | Case-control    | <p>(1) HIV-positive cases were more likely than HIV-negative controls to report not having health insurance (OR = 2.5, 95 % CI [1.1, 5.8]), but there were no differences in the type of health insurance reported</p> <p>(2) HIV-positive cases were more likely to report not having a primary HCP (OR = 6.4, 95 % CI [2.4, 17.1]), not receiving advice on HIV or STD prevention or testing (OR = 5.4, 95 % CI [1.3, 21.5]), and disclosing sexual identity to a HCP (OR = 7.0, 95 % CI [1.6, 29.3])</p> <p>(3) Lacking a primary HCP (AOR = 4.5, 95 % CI [1.4, 14.7]) and not disclosing sexual identity to a HCP (AOR = 8.6, 95 % CI [0.8, 40.0]) were associated with HIV infection</p>  |



**Table 2** continued

| Authors, references         | Locations  | Study samples                                     | Study design                        | Key findings   |
|-----------------------------|--|---|-------------------------------------|--|
| Fuqua et al. [74]           | San Francisco, CA  | 256 BMSM  | Cross-sectional with some follow-up | (1) 23 % of HIV-positive BMSM were unaware of their infection<br>(2) 27 % of newly diagnosed BMSM returned for their confirmatory HIV test result despite follow-up reminder phone calls, which underscores the challenges of linkage to care                              |
| Halkitis et al. [80]        | New York City  | 456 HIV-positive MSM                              | Cross-sectional                     | BMSM were less likely to be on ART than White or Latino MSM ( $p < 0.005$ ), but there were no differences across race/ethnicity in CD4 count, viral load, access to insurance, or source of HIV medical care  |
| Halkitis et al. [79]        | New York City  | 300 HIV-positive MSM                              | Cohort                              | At baseline, BMSM had lower treatment adherence than MSM of other races and ethnicities ( $p < 0.0001$ ), and adherence remained relatively stable over time   |
| Hall et al. [77]            | 13 States or cities  | 100,375 HIV-positive people                       | Cohort                              | BMSM were less likely to be engaged in continuous care (41.4 %) or established in care after HIV diagnosis (54.5 %) compared with Hispanic/Latino (48.4 and 70.6 %, respectively) and White MSM (50.7 and 74.8 %, respectively)  |
| Hightow-Weidman et al. [83] | Bronx, Rochester, Chapel Hill, Chicago, Detroit, Houston, Los Angeles, Oakland | 155 HIV-positive young racial/ethnic minority MSM | Cohort                              | There were no differences between BMSM and Latino MSM in having a baseline CD4 count $\leq 350$ ( $p = 0.311$ ) or in starting ART ( $p = 0.992$ )   |
| Hightow-Weidman et al. [75] | Bronx, Rochester, Chapel Hill, Chicago, Detroit, Houston, Los Angeles, Oakland | 363 HIV-positive young racial/ethnic minority MSM | Cohort                              | Retention in care for 1 year was lower for BMSM (79.9 %) than for Latino MSM (96.2 %; $p = 0.006$ )  |
| Jones et al. [172]          | Nashville, TN  | 4 BMSM who are sex workers                        | Qualitative                         | Participants discussed qualities of HCPs, such as trustworthiness and lack of judgment, that impact their utilization of outreach services. They also discussed the challenges of interacting with a non-responsive service system from a relatively powerless perspective |
| Lechuga et al. [173]        | Milwaukee, WI  | 633 MSM   | Cross-sectional                     | Higher proportions of Black (78.3 %) and Latino (77.6 %) MSM compared to White MSM (48.9 %) reported receiving an HIV test in the last 12 months (no $p$ value reported)   |
| MacKellar et al. [31]       | Baltimore, Dallas, Los Angeles, Miami, New York City, Seattle                  | 439 MSM with unrecognized HIV infection in NHBS   | Cross-sectional                     | HIV-positive BMSM were not significantly more likely than HIV-positive White MSM to report delayed testing (AOR = 1.6, 95 % CI [0.9, 2.9])   |
| Magnus et al. [61]          | Washington, DC   | 500 MSM in NHBS, including 178 BMSM               | Cross-sectional                     | BMSM were less likely than other MSM to have health insurance ( $p < 0.05$ ), to have been tested for HIV ( $p < 0.05$ ), and to have disclosed MSM status to HCPs ( $p < 0.01$ )  |
| Malebranche et al. [60]     | New York State and Atlanta, GA   | 81 BMSM   | Qualitative                         | The internalization of experiences of racial and sexual discrimination and negative encounters with medical institutions impact healthcare utilization, HIV testing, communication with HCPs, and medication adherence   |

**Table 2** continued

| Authors, references     | Locations                                   | Study samples                                     | Study design    | Key findings  |
|-------------------------|---|---|-----------------|---|
| Martinez and Hosek [57] | Chicago, IL                                 | Six non-gay-identified young BMSM                 | Qualitative     | Participants reported that it is difficult to trust HCPs with information pertaining to their sexual behaviors. Only through the development of trusting relationships with their HCPs would they reveal accurate information regarding their sexual behaviors  |
| McKirnan et al. [174]   | Chicago, IL                                 | 871 MSM   | Cross-sectional | BMSM were more likely than White MSM to report limited healthcare access (AOR = 1.33, $p < 0.001$ )   |
| Millett et al. [11]     | National                                    | Black and White MSM                               | Meta-analysis   | There was no difference between BMSM and White MSM in lifetime HIV testing (OR = 0.66, 95 % CI [0.34, 1.30])  |
| Millett et al. [12]     | National                                    | MSM who participated in 174 US studies            | Meta-analysis   | (1) Among HIV-negative MSM, BMSM were as likely as other MSM to have health insurance (OR = 0.86, 95 % CI [0.52, 1.43]) and have received a lifetime HIV test (OR = 0.84, 95 % CI [0.63, 1.12]), but were more likely than White MSM to have received an HIV test in the past year (OR = 1.51, 95 % CI [1.11, 2.05]), to have received repeat HIV testing (OR = 1.49, 95 % CI [1.29, 1.73]), to have undiagnosed HIV infection (OR = 6.38, 95 % CI [4.33, 9.39]), and to have used PEP/PrEP (OR = 1.99, 95 % CI [1.32, 3.00])<br>(2) Among HIV-positive MSM, BMSM were less likely than other MSM to initiate cART (OR = 0.40, 95 % CI [0.26, 0.62]), have health insurance (OR = 0.47, 95 % CI [0.29, 0.77]), have a high CD4 count (OR = 0.49, 95 % CI [0.34, 0.71]), and be virally suppressed (OR = 0.51, 95 % CI [0.31, 0.83]) |
| Mimiaga et al. [27]     | Boston, MA                                  | 197 BMSM  | Cross-sectional | (1) 33 % of HIV-negative BMSM had not been tested for HIV in the last 2 years<br>(2) Not having received an HIV test in the last 2 years was associated with lower likelihoods of visiting a HCP in the last 12 months (RR = 0.39, 95 % CI [0.11, 0.55]) and having a HCP recommend HIV testing at their last visit (ARR = 0.26, 95 % CI [0.04, 0.67])  |
| Nanin et al. [58]       | New York City                               | 29 BMSM   | Qualitative     | Perceptions of lack of anonymity, breach of confidentiality, and lower reliability of rapid HIV tests compared to standard blood-draw tests were identified as barriers to HIV testing  |
| Nelson et al. [72]      | Seattle, WA                                 | 77 Newly diagnosed HIV-positive MSM               | Cross-sectional | (1) HIV-positive BMSM were more likely than other HIV-positive MSM to be delayed testers, defined as having been diagnosed with HIV 1 year or more after HIV infection ( $p < 0.01$ )<br>(2) HIV-positive BMSM were more likely to be delayed testers than non-delayed testers (AOR = 17.2, 95 % CI [1.8, 166])   |
| Oh et al. [82]          | Baltimore, Chicago, Pittsburgh, Los Angeles | 1,102 Black, Hispanic, and White HIV-positive MSM | Cohort          | BMSM were more likely than White MSM to report less than 100 % ART adherence (AOR = 1.37, 95 % CI [1.05, 1.79])   |

**Table 2** continued

| Authors, references     | Locations           | Study samples                            | Study design              | Key findings  |
|-------------------------|---------------------|--|---------------------------|---|
| Oster et al. [81]       | 21 Cities           | 8,166 Black and White MSM in NHBS        | Cross-sectional           | <p>(1) Among newly diagnosed HIV-positive MSM, there were no significant differences between BMSM and White MSM in health insurance (<math>p = 0.10</math>), seeing a HCP in the last 12 months (<math>p = 0.73</math>), being tested for HIV in the past 12 months (<math>p = 0.23</math>), and number of times tested in the past 2 years (<math>p = 0.52</math>), but BMSM were more likely than White MSM to have been offered an HIV test by a HCP (<math>p &lt; 0.0001</math>)</p> <p>(2) Among previously diagnosed HIV-positive MSM, BMSM were less likely than White MSM to report having health insurance (<math>p = 0.02</math>), having been seen by a HCP within 3 months of diagnosis (<math>p = 0.02</math>), and being on ART at the time of interview (<math>p &lt; 0.0003</math>). BMSM were as likely as White MSM to have been seen by a HCP for HIV infection within the past 6 months (<math>p = 0.13</math>)</p> |
| Petroll and Mosack [53] | Milwaukee, WI       | 271 MSM                                  | Cross-sectional           | <p>(1) BMSM were less likely than White MSM to have PCPs who were aware of their sexual orientation (<math>p = 0.015</math>)</p> <p>(2) Participants with female (<math>p = 0.032</math>), gay (<math>p = 0.001</math>), or younger (<math>p = 0.047</math>) PCPs were more likely to have disclosed their sexual orientation</p> <p>(3) PCP knowledge of sexual orientation was associated with higher likelihoods that PCPs recommended HIV testing (<math>p = 0.0001</math>) and that participants had been tested for HIV (<math>p = 0.0001</math>)</p>   |
| Pierce et al. [154]     | Chicago, IL         | 788 Young BMSM                           | Ecologic, cross-sectional | Areas in which young BMSM reside typically have low HIV service densities   |
| Saleh et al. [109]      | Northern California | 21 Black MSMW and 21 service providers   | Qualitative               | <p>(1) Non-gay-identified Black MSMW can challenge assumptions of HCPs about sexual behavior and sexual identity</p> <p>(2) Attitudes of HCPs toward Black MSMW can be affected by ambivalent or negative beliefs that pervade the general community</p> <p>(3) Black MSMW may experience anxiety about disclosing same-sex behaviors to counselors, and they need safe and nonjudgmental spaces that offer HIV risk reduction</p>  |
| Schneider et al. [175]  | Chicago, IL         | 204 HIV-negative and HIV-positive BMSM   | Cross-sectional           | <p>(1) BMSM had high utilization of HIV Health Centers (45.9–70.3 %), but high-risk HIV-negative participants affiliated most with HIV Health Centers that offered only treatment services</p> <p>(2) BMSM who are in the same age group, who have the same HIV status, and who have similarly sized social networks are more likely to use the same health centers as each other (no <math>p</math>-values reported)</p>   |
| Scott et al. [176]      | San Francisco, CA   | 440 White, Latino, and Black MSM in NHBS | Cross-sectional           | There were no differences in testing for HIV in the last 12 months ( $p = 0.71$ ), receiving condoms in the last 12 months ( $p = 0.55$ ), or utilizing any HIV prevention service ( $p = 0.36$ ) among Black, Latino, and White MSM  |



Table 2 continued

| Authors, references | Locations         | Study samples                        | Study design | Key findings   |
|---------------------|-------------------|--------------------------------------|--------------|--|
| Traeger et al. [76] | Boston, MA        | 503 HIV-positive MSM in primary care | Cohort       | BMSM were more likely than White MSM to be non-adherent to HIV medical appointments over 12 months (AOR = 3.00, 95 % CI [1.50, 5.99])    |
| Wheeler [69]        | San Francisco, CA | 50 HIV-positive BMSM                 | Qualitative  | ART adherence is influenced by the relationship between the patient and HCP, and being able to be open and honest with HCPs is important |

BMSM Black men who have sex with men, MSM men who have sex with men, HCP healthcare provider, AOR adjusted odds ratio, CI confidence interval, MD medical doctor, NHBS National HIV Behavioral Surveillance, OR odds ratio, STD sexually transmitted disease, ART antiretroviral therapy, PEP post-exposure prophylaxis, PrEP pre-exposure prophylaxis, cART combination antiretroviral therapy, RR relative risk, ARR adjusted relative risk, PCP primary care provider, MSMW men who have sex with men and women

while further research is needed that focuses on the relationship between resources available to BMSM and their use of services, access to general healthcare services does not necessarily yield receipt of HIV testing and prevention services [46, 47]. One study among BMSM found a positive association between having health insurance and being unaware of one's HIV-positive status, suggesting that other factors such as stigma, fear of diagnosis, and perceived quality of services may serve more significant roles as barriers to learning one's status [48] (Table 2).

### Cultural Competency of Healthcare Services

BMSM experience barriers to accessing HIV testing and prevention services within micro-level informal and formal social influence dimensions related to the inadequate provision of culturally competent healthcare services (Table 1). Supportive social norms surrounding male-to-male sexual behavior as well as formal cultural competency of healthcare providers are critical for fostering positive relationships between providers and BMSM that facilitate access to HIV testing and prevention services at healthcare visits. Homophobia among physicians has decreased in recent years; however, research has shown that many physicians still express negative attitudes toward MSM [49, 50]. Many healthcare providers lack awareness of sexual identities and behaviors, and fail to recognize the importance of discussing sexual health with patients as a routine component of medical care [51–54]. Having expressed concerns pertaining to issues of confidentiality, discrimination, comfort, distrust, and conspiracy beliefs [55–60], BMSM are less likely than other MSM to disclose their sexual behavior or identity to healthcare providers [53, 61, 62]. Demonstrating the importance of an open and supportive patient-provider relationship for facilitating access to HIV testing and prevention services, MSM who disclosed their sexual behavior to their healthcare provider were more likely to discuss HIV, disclose their HIV status, accurately report unprotected anal intercourse (UAI), and obtain testing [44, 53, 62]. BMSM whose healthcare provider recommended HIV testing were more likely to have been tested in the last 2 years [63]. However, BMSM who disclose their sexual behavior to their healthcare providers may still fail to receive HIV prevention services. Among MSM in one study who had healthcare providers who were aware of their sexual behavior, only 59 % had received recommendations for HIV testing [53]. Moreover, among the 71.4 % of MSM who reported that their primary care provider was aware of their sexual orientation, 70.1 % reported having disclosed their sexual orientation without being asked, 13.8 % disclosed after the primary care provider asked, and 13.9 % believed their primary care provider correctly assumed their sexual orientation [53]. Those

who are less comfortable discussing their sexual behavior may not disclose unless their healthcare provider actively inquires [53] (Table 2).

#### *Access to PrEP and PEP*

While no studies were identified that investigated barriers to access of antiretroviral therapy (ART) medications as PrEP or PEP to prevent HIV infection among BMSM, research that investigates how structural factors may limit access to PrEP or PEP is needed. PrEP has been found to be partially efficacious among MSM [64], and based on results from an online survey in 2010, BMSM were more willing than non-Latino White MSM to use PrEP for HIV prevention purposes [65]. A meta-analysis also found that BMSM were more likely than non-Latino White MSM to use PEP or PrEP [12], though the analysis included results from studies conducted prior to approval of ART as PrEP by the US Food and Drug Administration. There are challenges to PrEP implementation among MSM, however, related to the limited willingness of physicians to prescribe PrEP, inadequate effectiveness and cultural competency of messages about PrEP, and high costs to individuals [66]. In addition, psychosocial issues (e.g., substance use, housing/shelter, intimate partner violence) can impede successful PrEP adherence among BMSM [67]. To better understand these complexities, future studies should examine how structural factors affect access and adherence to PrEP and PEP among BMSM.

#### *Treatment as Prevention*

There are also barriers to treatment and care services among HIV-positive BMSM. While these are distinct from barriers to prevention services, they increase the virulence among sexual networks of BMSM and consequently increase the likelihood of HIV transmission [38], indirectly serving as a barrier to HIV prevention among this population. Since BMSM are more likely to have sexual partners who are Black, more effective treatment and care services may help decrease HIV transmission among the sexual networks of Black communities [30]. Similar to barriers to services experienced by HIV-negative BMSM, self-reported barriers to ART adherence and retention in care among HIV-positive BMSM include medical miscommunication, low levels of healthcare provider cultural competency, mistrust, embarrassment, racism, and sexual prejudice [60, 68–71], encompassing informal and formal social influence structural dimensions on micro-level structures of society (Table 1). Research has found that HIV-positive BMSM were more likely than other HIV-positive MSM to be delayed testers [72, 73], and in an HIV testing program that used respondent-driven sampling to

recruit BMSM, only 27 % of newly diagnosed men returned to receive their confirmatory test results and discuss referrals to care [74]. While it is possible that men already had a healthcare provider that they chose to go to for follow-up, the authors hypothesized that they may have been psychologically unready to receive confirmation of their HIV-positive status, serving as a barrier in linkage to care [74]. Consistent with such challenges, studies have found that BMSM were less likely to be retained in HIV care compared to non-Latino White MSM [75–77] and less likely than other MSM to be virally suppressed 1 year after diagnosis [78]. However, there is inconsistent evidence that HIV-positive BMSM have lower ART adherence than other HIV-positive MSM. Four studies found lower adherence among BMSM compared to other MSM [79–82], yet two other studies found no differences by race/ethnicity among MSM [83, 84] (Table 2).

#### *Stigma and Discrimination*

Based on interconnected social inequalities that exist on meso and micro structural levels of society, experiences of stigma and discrimination due to race [15, 17, 85–97] and sexual orientation [15, 22, 86, 92, 96, 98–104] among BMSM are significant barriers to HIV testing and prevention services within the structural dimension of informal social influence and control (Table 1). Consistent with studies that have found that stigma and discrimination are correlates of HIV risk among BMSM [105–108] (Table 3), there is strong evidence that experiences of stigma and discrimination due to race and sexual orientation—operating through social interactions at healthcare visits and within social networks—negatively affect access to HIV testing and prevention services among this population [14, 22, 58, 60, 109–112]. Such experiences may involve overt forms of discrimination as well as micro-aggressions, which are defined as brief, commonplace, often unintentional, daily verbal, behavioral, and environmental affronts directed at people of color and other disenfranchised groups [113]. BMSM across multiple studies have indicated perceptions of racism and homophobia during visits to healthcare providers and were less likely to use HIV prevention services if they were unable to access non-judgmental, comfortable healthcare environments [14, 22, 109]. Voluntary HIV testing and use of HIV prevention services often involve the disclosure of stigmatized sexual behavior, such as having same-sex, anonymous, or multiple sexual partners [114–116], which can also impede BMSM from using these services [58, 110]. If BMSM are HIV-positive or perceived to be HIV-positive, they may also experience stigma due to HIV status [101, 117–121], sometimes leading to a fear of diagnosis and further hindering the use of prevention services [58]. Additionally,

**Table 3** Studies of stigma or discrimination and HIV risk in BMSM

| Authors, references | Locations                                       | Study samples   | Study design   | Prevalence of experiences of stigma or discrimination  | Key findings   |
|---------------------|---|---|--|--|--|
| Ayala et al. [105]  | Los Angeles County, New York City, Philadelphia | 1,154 Black and 1,081 Latino MSM in the Brothers y Hermanos study | Cross-sectional  | N/A  | BMSM who engaged in serodiscordant or unknown-status UAI reported higher mean scores for experiences of racism ( $p = 0.003$ ) and homophobia ( $p < 0.001$ ) than BMSM who did not engage in serodiscordant or unknown-status UAI, and these associations were mediated by potentially risky situations<br><br>(1) Black participants who experienced greater racial discrimination were less likely to have a high CD4 cell count (AOR = 0.7, 95 % CI [0.5, 0.9]) and an undetectable viral load (AOR = 0.8, 95 % CI [0.6, 1.0]), and were more likely to visit the emergency department (AOR = 1.3, 95 % CI [1.0, 1.7])<br><br>(2) Sexual orientation discrimination was associated with higher CD4 cell counts (AOR = 1.5, 95 % CI [1.0, 2.2])<br><br>(3) No effects were significant for HIV serostatus discrimination<br><br>(4) The combined effects of three types of discrimination due to race, sexual orientation, and HIV-status predicted greater AIDS symptoms, defined as the number of 14 AIDS-related symptoms (e.g., diarrhea, fever) experienced for at least 2 weeks in the past 3 months ( $p < 0.01$ )<br><br>Experiences of racial discrimination, but not discrimination due to sexual orientation or HIV status, were associated with ART nonadherence over a 6-month follow-up period ( $p < 0.01$ ), and those who experienced high levels of discrimination had worse ART adherence than did those who experienced low levels of racial discrimination or no racial discrimination |
| Bogart et al. [177] | Los Angeles, CA                                 | 181 HIV-positive BMSM and 167 HIV-positive Latino MSM             | Cross-sectional (baseline data used from a cohort study) | Among BMSM, 53 % experienced racial discrimination, 45 % experience discrimination due to HIV-status, and 44 % experienced discrimination due to sexual orientation in the last year       |  |
| Bogart et al. [99]  | Los Angeles, CA                                 | 152 HIV-positive BMSM   | Cohort   | Over 6 months, 38 % experienced discrimination due to HIV serostatus, 40 % experienced discrimination due to race/ethnicity, and 33 % experienced discrimination due to sexual orientation |  |

**Table 3** continued

| Authors, references   | Locations                   | Study samples                                    | Study design              | Prevalence of experiences of stigma or discrimination   | Key findings  |
|-----------------------|-----------------------------|--|---------------------------|---|---|
| Dillon and Basu [22]  | National                    | Black and Latino MSM from 12 qualitative studies | Qualitative meta-analysis | N/A   | BMSM reported that stigma surrounding MSM and HIV/AIDS led to a decreased likelihood of discussing sexual practices and HIV prevention with family, friends, and sexual partners. BMSM also reported avoidance of HIV prevention services due to distrust   |
| Fields et al. [108]   | Los Angeles, CA             | 131 HIV-positive BMSM                            | Cross-sectional           | Of the 60 % who experienced any interpersonal trauma, 47 % attributed at least one trauma experience to being gay, 17 % to race, and 9 % to HIV serostatus  | Experiencing discrimination-related trauma was associated with UAI with any male partner (AOR = 2.44, 95 % CI [1.05, 5.71]) and UAI with an HIV-positive male partner (AOR = 3.49, 95 % CI [1.42, 8.61])  |
| Jeffries et al. [106] | New York City, Philadelphia | 1,154 BMSM in the Brothers y Hermanos study      | Cross-sectional           | In the past 12 months, 9–13 % were hit or beaten up due to homophobia, 34–39 % were treated rudely or unfairly, 36–41 % were made fun of or called names, 35–45 % had to act more manly than usual to be accepted, and 39–41 % felt uncomfortable in a crowd of heterosexual Black people | <p>(1) Among men not previously diagnosed with HIV infection, medium-level (AOR = 1.71, 95 % CI [1.06, 2.52]) and high-level homophobic experiences (AOR = 1.71, 95 % CI [0.95, 3.08]) compared to no homophobic experiences were associated with UAI</p> <p>(2) Among men who knew they were HIV-infected, low-level (AOR = 2.77, 95 % CI [1.39, 5.54]), medium-level (AOR = 2.83, 95 % CI [1.61, 4.98]), and high-level (AOR = 2.48, 95 % CI [1.09, 5.65]) homophobic experiences compared to no homophobic experiences were associated with transmission risk behavior</p> |

Table 3 continued

| Authors, references      | Locations                    | Study samples                                   | Study design    | Prevalence of experiences of stigma or discrimination  | Key findings  |
|--------------------------|------------------------------|---|-----------------|--|---|
| Malebranche et al. [107] | Atlanta, GA                  | 456 BMSM in the Brothers United Study           | Cross-sectional | 43.9 % Reported experiences of discrimination because of being gay   | (1) Men who experienced discrimination because of being gay were more likely than those who had not experienced discrimination for being gay to report UIAI (AOR = 1.6, 95 % CI [1.0, 2.6]) and URAI (AOR = 1.6, 95 % CI [1.0, 2.6]) with men, although the association between discrimination and URAI was marginally insignificant<br>(2) Higher gender role conflict did not predict UIAI (OR = 1.1, 95 % CI [0.9, 1.4]) or URAI (OR = 1.1, 95 % CI [0.8, 1.4]) with men, but predicted UV/UIAI with women among bisexually active participants (OR = 2.0, 95 % CI [1.0, 3.9])<br>Greater internalized HIV stigma was associated with less HIV status disclosure to participants' last sexual partner (AOR = 0.49, $p < 0.05$ ) and to family members ( $p < 0.05$ ) |
| Overstreet et al. [178]  | Atlanta, GA                  | 156 HIV-positive BMSM                           | Cross-sectional | N/A  | (1) BMSM who endorsed higher levels of sexual minority stigma engaged in less UIAI ( $p < 0.01$ )<br>(2) BMSM who endorsed more HIV stigma engaged in less UIAI ( $p < 0.05$ ) but more URAI ( $p < 0.01$ ), and engaged in more UIAI while high or intoxicated ( $p < 0.05$ )  |
| Radcliffe et al. [98]    | Philadelphia, PA             | 40 HIV-positive young BMSM                      | Cross-sectional | 90 % Endorsed stigma related to their nonheterosexual status, 88 % endorsed stigma related to their HIV status, and 78 % endorsed both sexual minority stigma and HIV stigma |   |
| Robinson et al. [158]    | Boston, Minneapolis–St. Paul | 217 HIV-positive and 302 HIV-negative BMSM      | Case-control    | N/A  | (1) HIV-positive men reported lower levels of internalized homonegativity compared to HIV-negative men ( $p = 0.006$ )<br>(2) Being HIV-positive was not significantly associated with experiences of homophobia  |
| Wohl et al. [179]        | Los Angeles County, CA       | 398 HIV-positive Latino and Black MSM and women | Cross-sectional | N/A  | Among BMSM, MSM stigma and HIV-related stigma were not significantly associated with retention in HIV care  |

BMSM Black men who have sex with men, MSM men who have sex with men, UIAI unprotected anal intercourse, AOR adjusted odds ratio, CI confidence interval, ART antiretroviral therapy, UIAI unprotected insertive anal intercourse, URAI unprotected receptive anal intercourse, OR odds ratio, UVI unprotected vaginal intercourse



Blacks are more disapproving of homosexuality than Whites, even after controlling for religious and educational differences, which promotes internalized homophobia and may inhibit BMSM from adopting HIV testing behaviors [122–124]. Experiences of stigma and discrimination among BMSM have consistently been associated with negative mental health outcomes, including depression and lower self-esteem [90, 96, 101, 112, 125, 126], and studies have found that poor mental health—which is associated with HIV infection [127–132]—can contribute to the inadequate use of HIV testing and prevention services among this population [60, 90, 111, 112]. One study found that experiences of homophobia and racism in Black and LGBT communities, respectively, may lead to a psychological displacement that decreases the use of services and negatively affects open communication with healthcare providers [60]. Two studies found that racism and homophobia hindered the motivation of BMSM to access HIV prevention information [111, 112], and another study found that those who had a less positive self-identification of being Black and gay reported lower HIV prevention self-efficacy [90] (Table 3). In order to expand access to HIV testing and prevention services among BMSM, it is critical to address stigma and discrimination due to race, sexual orientation, and perceived HIV status on a structural level.

#### Incarceration

Incarceration acts as a major structural barrier to HIV testing and prevention services for BMSM across meso-level dimensions of resources and social influence and control factors (Table 1). The rates of incarceration among Black men [133, 134] and BMSM [12, 61, 110, 135–138] are highly disproportionate compared to rates among men and MSM, respectively, both of other races/ethnicities. Additionally, the HIV prevalence is approximately five times higher in prisons than in the general population [139, 140]. Despite research indicating that high HIV prevalence rates in correctional institutions may result primarily from transmission occurring prior to incarceration [141] and limited evidence of an association between incarceration and increased HIV risk among BMSM [20, 61, 81, 110, 142–144] (Table 4), incarcerated settings are an important venue for the provision of comprehensive HIV testing, prevention, and education services. Previously incarcerated individuals often return to communities lacking preventive health information and skills, appropriate medical services, and other necessary forms of support [145]. There is also some evidence that HIV prevention case management and peer education programs have decreased risk behaviors and increased HIV knowledge among participants, though research on HIV prevention interventions in correctional settings is scarce [145, 146]. Despite the high HIV

prevalence in prisons, only 20 states test all inmates for HIV at admission or while in prison, and only three states test them upon release [147]. In one state, only 31 % of male prisoners received a voluntary HIV test upon admission and many inmates were unaware of their status [148]. Prisons in certain states do offer services including instructor-led educational modules, peer education programs, and HIV prevention case management, but they are inconsistent [146, 149, 150]. Prisoners also experience a lack of condom availability [151], as only two state prison systems and five city/county jail systems in the US make condoms available to male inmates [152, 153]. Among Black men in one study who reported having anal intercourse while incarcerated, 90 % reported never using a condom during anal sex while incarcerated compared with 42 % who reported never using a condom during anal sex while not incarcerated [143]. Taken together, these studies demonstrate that improving the completeness and consistency of HIV testing and prevention services in correctional facilities represents a salient structural-level opportunity to expand services to more BMSM.

#### Poverty

The effect of poverty on access to HIV testing and prevention services among BMSM is complex and not well understood. The unbalanced geographic distribution of services can act as a structural barrier to services within the meso-level dimension of settings (Table 1), as one study found that areas of a city where young BMSM lived and reported the highest rates of UAI also had the lowest densities of HIV prevention services [154]. While services were located primarily in areas most affected by HIV in the earlier years of the epidemic, there was a deficiency of services in Black communities despite a higher HIV prevalence in those areas of the city [154]. There is a void in research examining the potential relationship between socioeconomic status (SES) and access to HIV testing and prevention services among BMSM. Given that BMSM face economic and social challenges related to the unequal geographic allocation of resources, high levels of unemployment, the spatial concentration of violent crime, and disproportionate placement in the lowest-performing schools [155–157], this is a particularly critical area of investigation. Although no articles were identified that discussed the relationship between SES and access to HIV prevention services among BMSM, studies among BMSM have found inconsistent evidence that poverty is associated with a greater risk of HIV infection [44, 48, 74, 105, 110, 158] (Table 5). However, their analyses have generally used arbitrary categorizations of self-reported income that have differed across studies and may account for some of the disparate results. A positive association between low

**Table 4** Studies of incarceration and HIV risk in BMSM

| Authors, references | Locations  | Study samples   | Study design    | Prevalence or incidence of incarceration   | Key findings  |
|---------------------|--|---|-----------------|--|---|
| Brewer et al. [142] | Boston, Atlanta, Los Angeles, New York City, San Francisco, Washington, DC | 1,278 BMSM in HPTN 061 study  | Cohort          | The estimated annualized incarceration incidence was 35 % per 100 person-years   | There was no association between incarceration during study follow-up and incident HIV infection (AHR = 1.69, 95 % CI [0.64, 4.44])   |
| Brewer et al. [135] | Boston, Atlanta, Los Angeles, New York City, San Francisco, Washington, DC | 1,553 BMSM in HPTN 061 study  | Cross-sectional | 60.0 % Reported a history of incarceration   | Incarceration history was not associated with having two or more male partners (AOR = 1.13, 95 % CI [0.84, 1.51]) or URAI with any male partner (AOR = 0.89, 95 % CI [0.71, 1.12]) in the 6 months prior to enrollment  |
| Bland et al. [20]   | Boston, MA   | 197 BMSM  | Cross-sectional | 51 % Reported a lifetime history of incarceration and 46 % of those reported ≥90 days in jail or prison the last time they were incarcerated | (1) Incarceration for <90 days was associated with UAI with a male partner in last 12 months (AOR = 3.09, 95 % CI [1.34, 7.14]), UAI with three or more male partners in last 12 months (AOR = 2.55, 95 % CI [1.09, 5.97]), and UAI with the most recent male sex partner (AOR = 2.32, 95 % CI [1.03, 5.19])<br>(2) Incarceration for ≥90 days was associated with unprotected vaginal or anal sex with a female partner in last 12 months (AOR = 2.46, 95 % CI [1.01, 5.99]) |
| CDC [144]           | Georgia  | 88 Male inmates who seroconverted during incarceration and 88 controls matched by sentence length and time already served | Case-control    | N/A  | HIV seroconversion during incarceration was associated with any male-male sex in prison (AOR = 10.1, 95 % CI [3.0, 54.9]) and Black race (AOR = 3.7, 95 % CI [1.1, 16.7])   |
| Jones et al. [110]  | Three North Carolina cities  | 252 BMSM  | Cross-sectional | 7.5 % had spent time in jail or prison during the past 2 months  | Men who were incarcerated in the last 2 months were significantly more likely to report URAI than those who were not incarcerated in the last 2 months (OR = 2.64, 95 % CI [1.03, 6.78])  |
| Magnus et al. [61]  | Washington, DC   | 500 MSM in NHBS including 178 BMSM  | Cross-sectional | Among BMSM, 25.5 % reported having ever been to jail, prison, or juvenile detention  | Among BMSM, incarceration was not associated with being confirmed HIV-positive (AOR = 1.34, 95 % CI [0.79, 2.25])   |
| Oster et al. [81]   | 21 Metropolitan statistical areas  | 5,183 Black and White MSM not previously diagnosed with HIV infection in NHBS   | Cross-sectional | N/A  | Incarceration in the past 12 months was not associated with HIV infection (AOR = 0.8, 95 % CI [0.6, 1.2]), suggesting that it does not explain the disparity in HIV infection between BMSM and White MSM  |

**Table 4** continued

| Authors, references | Locations              | Study samples  | Study design | Prevalence or incidence of incarceration   | Key findings  |
|---------------------|------------------------|--|--------------|--|---|
| Wohl et al. [143]   | Los Angeles County, CA | 305 HIV-positive Black men, of ages 20–49, and 305 neighborhood controls, frequency-matched by age | Case-control | 54.4 % had a history of incarceration in a jail, detention center, or prison between 1978 and first positive HIV test result (or that of the control's matched case) | <p>(1) After controlling for anal sex while not incarcerated, there was no association between anal sex during incarceration and HIV infection (AOR = 1.1, 95 % CI [0.6, 2.2])</p> <p>(2) Among men with a history of incarceration, the percentage reporting anal sex with men outside of incarceration (45 %) was greater than those reporting anal sex while incarcerated (16 %)</p> <p>(3) Increased time in jail or prison was associated with less HIV infection (<math>p = 0.001</math>)</p> |

*BMSM* Black men who have sex with men, *HPTN* HIV Prevention Trials Network, *AHR* adjusted hazard ratio, *CI* confidence interval, *AOR* adjusted odds ratio, *URAI* unprotected receptive anal intercourse, *UAI* unprotected anal intercourse, *OR* odds ratio, *MSM*, men who have sex with men, *NHBS* National HIV Behavioral Surveillance

income and HIV risk was reported by two studies [158, 159], one of which found that having an income less than \$15,000 was one of the best predictors of UAI [159]. Others found non-significant associations between low income and HIV infection [44], financial hardship and UAI [105], and unemployment and UAI [110]. More rigorous research aiming to better understand the effects of poverty—and those of its intersectional nature with race, gender, and sexuality [160]—on access to services and risk of HIV infection among BMSM is needed. As the impact of poverty on access to HIV testing and prevention services among BMSM is complex, future research should consider specific mechanisms by which low SES may impede access to services, potentially involving the locations of HIV prevention service providers, convenience of available forms of transportation, physical layout of facilities, and exposure to community violence.

## Discussion

The overarching objective of this research based on a critical review of the literature was to better understand how structural factors act as barriers to accessing HIV testing and prevention services among BMSM. The findings from this review provide compelling evidence that a novel approach to designing HIV prevention interventions that reflects the structural contexts in which BMSM access services is needed. Our analysis provides relevant findings pertaining to the complex processes by which structural factors are, in fact, related to individual testing behaviors and use of prevention services. In addition to aiming to reduce sexual risk behaviors, interventions for BMSM on a structural level ought to focus on the development and implementation of culturally congruent strategies that would eliminate barriers to accessing HIV testing and prevention services and equip BMSM with the knowledge, skills, and tools to navigate complex systems that may not meet their needs. Structural interventions that have been developed for other populations [161–165] can also be adopted for implementation with BMSM.

In using the dynamic social systems model developed by Latkin et al. [7] to conceptualize the roles of structural factors as barriers to HIV testing and prevention services, three major themes emerged that underscore the strong social nature of structural barriers to services among BMSM. First, non-supportive relationships with healthcare providers within micro-level informal and formal social influence and control dimensions can impede access to services, as experiences of racism and homophobia during visits with healthcare providers limit the receipt of comprehensive HIV testing and prevention services [14, 109, 112]. Positive patient–provider relationships are critical for

**Table 5** Studies of poverty and HIV risk in BMSM

| Authors, references   | Locations                                       | Study samples                                       | Study design    | Prevalence of poverty  | Key findings  |
|-----------------------|---|---|-----------------|--|---|
| Ayala et al. [105]    | Los Angeles County, New York City, Philadelphia | 1,154 Black and 1,081 Latino MSM                    | Cross-sectional | Among BMSM, 35 % had an annual income <\$5,000, 24 % had one between \$5,000 and 9,999, and 24 % had one between \$10,000 and 19,999   | Among BMSM, financial hardship—as measured by how often a participant had run out of money for basic needs in the last 12 months—was not associated with UAI with a serodiscordant or serostatus-unknown partner ( $p = 0.45$ )   |
| Dorell et al. [44]    | Jackson, MS                                     | 30 HIV-positive and 95 HIV-negative BMSM            | Case-control    | Among HIV-positive BMSM, 17 % had a monthly income <\$1,500. Among HIV-negative BMSM, 37 % had a monthly income <\$1,500   | No significant association was found between income level and HIV-status (OR = 2.8, 95 % CI [0.9, 10.1])  |
| Fuqua et al. [74]     | San Francisco, CA                               | 256 BMSM  | Cross-sectional | 60.9 % had an income between \$0 and 10,000 and 18.8 % had one between \$10,001 and 20,000 (RDS weighted percents)   | (1) Compared to BMSM with an income between \$0 and 10,000, having an income between \$10,001 and 20,000 was associated with HIV-positive status (AOR = 2.58, 95 % CI [1.16, 5.73]). A positive association between having an income between \$20,001 and 30,000 and HIV-positive status was marginally insignificant (AOR = 2.82, 95 % CI [0.98, 8.15]) and no association was found between having an income of at least \$30,001 and HIV-positive status (AOR = 0.49, 95 % CI [0.15, 1.6])<br>(2) Currently being homeless was associated with a lower risk of HIV infection (AOR = 0.37, 95 % CI [0.16–0.83]) |
| Millett et al. [48]   | New York, Philadelphia, Los Angeles             | 597 Black and 611 Hispanic MSM                      | Cross-sectional | Among HIV-positive unaware BMSM, 24.5 % had a gross personal income <\$5,000, 24.5 % had one between \$5,000 and 9,999, and 28.4 % had one between \$10,000 and 19,999. Among HIV-negative BMSM, 42.4 % had a gross personal income <\$5,000, 19.3 % had one between \$5,000 and 9,999, and 15.1 % had one between \$10,000 and 19,999 | Among BMSM, HIV-positive unaware men were more likely than HIV-negative men to have a gross personal income between \$5,000 and 9,999 (AOR = 2.75, 95 % CI [1.18, 6.41]) or between \$10,000 and 19,999 (AOR = 3.72, 95 % CI [1.58, 8.78]) compared to <\$5,000, but not >\$20,000 compared to <\$5,000 (AOR = 2.20, 95 % CI [0.90, 5.41])  |
| Murchler et al. [180] | Los Angeles County, CA                          | 50 Black, 50 Latino, and 50 White HIV-positive MSMW | Cross-sectional | Among Black MSMW, 32 % had an annual income <\$8,240   | Among Black HIV-positive MSMW, annual household income was not associated with UAI with a male partner without disclosure of HIV-status in the last 5 years (OR = 0.9, 95 % CI [0.3, 2.8])  |

**Table 5** continued

| Authors, references   | Locations                    | Study samples   | Study design    | Prevalence of poverty   | Key findings  |
|-----------------------|------------------------------|---|-----------------|---|---|
| Myers et al. [159]    | Los Angeles County, CA       | 502 Black men including 235 MSM and MSMW in the African American Health Project | Cross-sectional | The mean annual household income was \$17,300 and 31.6 % were employed full- or part-time                     | Among HIV-positive and HIV-negative BMSM and Black MSMW, one of the best predictors of risky sexual behavior was having an income less than \$15,000 per year, which was associated with a 46.6 % increase in risky behavior (defined as a composite measure of number of sexual partners, sex while incarcerated, condom use in monogamous relationships versus condom use with multiple partners, exchange of sex for money or drugs, and sex under the influence of alcohol or drugs) ( $p = 0.0004$ ) |
| Robinson et al. [158] | Boston, Minneapolis–St. Paul | 217 HIV-positive and 302 HIV-negative BMSM                                      | Case-control    | Among HIV-positive BMSM, 58 % were living in poverty.<br>Among HIV-negative BMSM, 45 % were living in poverty | (1) HIV-positive BMSM were more likely to be living below the poverty level than HIV-negative MSM, but the results were marginally insignificant (AOR = 1.7, 95 % CI [1.0, 3.0])<br>(2) HIV-positive BMSM were not significantly more likely than HIV-negative BMSM to be unemployed (AOR = 1.8, 95 % CI [0.9, 3.5]) or classified as student/retired/other (AOR = 0.8, 95 % CI [0.2, 2.8]) than being employed   |

*BMSM* Black men who have sex with men, *MSM* men who have sex with men, *UAI* unprotected anal intercourse, *OR* odds ratio, *CI* confidence interval, *RDS* respondent-driven sampling, *AOR* adjusted odds ratio, *MSMW* men who have sex with men and women



the provision of HIV prevention services by healthcare providers, which has been found to decrease risk behaviors [166, 167], increase HIV testing [51, 52, 62, 168], increase condom use, increase frequency of asking a sexual partner's HIV status, and decrease the number of sexual partners [28]. Many healthcare providers lack cultural competency for working with patients of diverse sexual identities, and fail to recognize the importance of discussing sexual health with patients as a routine component of medical care [51–54]. More comprehensive training of healthcare providers that encourages a proactive, client-centered, and nonjudgmental approach to HIV counseling and screening regardless of how patients identify or present themselves is needed to facilitate a better understanding of how HIV prevention fits into patients' life priorities [53, 62, 169]. In 2013, the US Preventive Services Task Force updated its 2005 recommendation statement on screening for HIV to include all adolescents and adults aged 15–65—not only those who are known to be at increased risk for HIV infection—which may contribute to an increase in HIV testing among BMSM at healthcare visits [170].

Second, non-supportive relationships with members of social networks within micro-level informal social influence structures can also impede BMSM from accessing services. A lack of social support—often associated with experiences of stigma and discrimination from family, friends, and other community members due to sexual orientation, race, and/or perceived HIV status—can lead to negative mental health outcomes that hinder BMSM from accessing services [60, 90, 111, 112]. Experiences of stigma and discrimination diminish the motivation of BMSM to access HIV prevention information [111, 112] and lower their HIV prevention self-efficacy [90]. Testing for HIV is also stigmatized among social networks of BMSM, which can inhibit men from using these services [58, 110].

Third, many BMSM lack access to healthcare services due to insufficient economic and infrastructural resources. While the percentage of BMSM who lack health insurance coverage is unclear, it may be similar to the 19.0 % of Blacks in the US that reported not having health insurance coverage in 2012 [43]. With the full implementation of the *Patient Protection and Affordable Care Act* in January 2014, however, expanded and enhanced health insurance coverage may increase access to HIV prevention and care services among BMSM. As a result of this law, preventive care including HIV screening and counseling must be covered by insurance premiums and most insurance plans are unable to increase costs or refuse coverage to an individual as a result of a pre-existing health condition, including HIV infection [171]. Regardless of insurance status, there is some evidence that BMSM have reported high perceived costs and low perceived benefits of

healthcare visits as barriers to accessing services [45]. While HIV clinics and community-based testing (e.g., mobile HIV testing vans) offer alternative options for accessing HIV testing and prevention services, no studies were identified that assessed the use of such services by BMSM. Additionally, a disproportionate number of BMSM have recurring contact with the prison system, where men experience a lack of condom availability [151] and incomplete and inconsistent access to HIV prevention services [146, 149, 150]. Improving services in correctional facilities represents a salient structural-level opportunity to expand testing and prevention to this population. Innovative ways to make HIV testing more accessible to BMSM in clinical, non-clinical, and outreach venues are needed [44].

This review should be interpreted in the context of several limitations. Many of the studies reviewed were cross-sectional, so temporality and causality could not be determined. However, this limitation is most relevant to studies that assessed the risk of HIV infection associated with various structural factors. Studies that provided findings most pertinent to understanding the roles of structural factors as barriers to HIV testing and prevention services were generally qualitative studies, meta-analyses, and other studies that offered descriptive statistics. In addition, many of the studies collected data using self-reporting methods and their results may have been affected by misclassification and/or social desirability bias. There was also significant variability in geographic location and sampling schemes across study populations; thus, the generalizability of findings is limited. We hope that this review may lead to a more complete and rigorous investigation of the roles of structural factors as barriers to HIV testing and prevention services. While most quantitative findings were based on multivariable analyses, some analyses did not adjust for all possible correlates and some findings were based on bivariate analyses. Moreover, our findings may have been influenced by publication bias in that we relied on two core databases for our literature search and this review was limited by the available literature. However, the literature search returned a large quantity of results, and to minimize the number of pertinent articles that could be neglected, we also reviewed relevant articles that were cited as references within all papers that met inclusion criteria. Our search included limited search terms, though they were of a broad scope and we did not limit our review to articles that focused solely on HIV.

Despite these limitations, our findings provide critical implications for future HIV prevention research and the development of innovative and culturally grounded structural interventions focusing on improving access to HIV testing and prevention services for BMSM. To our knowledge, this is the first paper to fully consider the role of structural factors as barriers to HIV testing and

prevention services among BMSM, and our findings underscore the significant need for future studies to conduct more rigorous investigation into the roles of structural factors as barriers to services. These findings are also a call for the development of targeted interventions at the structural level that will reduce barriers to HIV testing and prevention services and provide BMSM with the knowledge, skills, and tools to more readily and consistently access available services in their communities.

**Acknowledgments** The authors acknowledge colleagues Kyle Gordon, Alexander King, Vittoria Criss, Dr. James Peterson, and Dr. Sheldon Fields for their devoted work on the R21 project (MH097586). The authors appreciate Dr. Alan Greenberg for his ongoing support and thank Laura Abate for her guidance in conducting the literature search. Research reported in this publication was supported by the National Institute of Mental Health of the National Institutes of Health under Award Number R21 MH097586. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health. The authors are grateful for the support and guidance provided by the District of Columbia Developmental Center for AIDS Research (DC D-CFAR), an NIH-funded Program (P30AI087714).

## Appendix 1

We searched titles and abstracts of articles in *PubMed* and *Scopus* for the search terms listed below corresponding to each search domain. An asterisk (\*) represents the truncation symbol in *PubMed* and *Scopus*. We also searched for articles in *PubMed* using MeSH terms, which are indicated by a dagger (†).

**Black** “Black”, “African American”, “African continental ancestry group”†, “African Americans”†.

**MSM** “homosex\*”, “bisex\*”, “men who have sex with men”, “MSM”, “MSMW”, “BMSM”, “gay”, “homosexuality, male”†, “bisexuality”†.

**Healthcare** “healthcare”, “care”, “access”, “communication”, “adher\*”, “retention”, “retain\*”, “utilization”, “testing”, “providers”, “engag\*”, “cultural competency”, “cART”, “ART”, “HAART”, “antiretroviral”, “health services”, “health center”, “insurance”, “health services accessibility”†, “healthcare disparities”†, “patient acceptance of healthcare”†, “health knowledge, attitudes, practice”†, “community health services”†, “health insurance”†, “health promotion”†.

**Stigma and discrimination** “stigma\*”, “homophobia”, “sexual prejudice”, “shame”, “HIV-related discrimination”, “negative beliefs”, “social bias”, “heterosex\*”, “racis\*”, “discriminat\*”, “prejudic\*”, “minority stress”, “prejudice”†, “self concept”†, “social perception”†, “stereotyping”†, “social support”†, “social control”†, “social isolation”†, “stress, psychological”†.

**Incarceration** “incarceration”, “prison\*”, “jail”, “prisoners”†.

**Poverty** “poverty”, “income”, “employ\*”, “unemploy\*”, “SES”, “socioeconomic”, “sociodemographic”, “socioeconomic factors”†, “risk factors”†, “poverty”†, “unemployment”†, “income”†.

**HIV** “HIV”, “AIDS”, “HIV infections”†.

**Structural factors** “barriers”, “disparities”, “determinants”, “social factors”, “environmental factors”, “structural\*”, “demographic”, “health status disparities”†, “sexual behavior/statistics and numerical data”†.

## References

1. CDC. Prevalence and awareness of HIV infection among men who have sex with men—21 cities, United States, 2008. *Morb Mortal Wkly Rep.* 2010;59(37):1201–7.
2. Koblin B, Mayer K, Eshleman S, et al. Correlates of HIV incidence among Black men who have sex with men in 6 U.S. cities (HPTN 061) [abstract]. In: 19th international AIDS conference, Washington, DC, 22–27 July 2012. Abstract number MOAC0106.
3. Koblin BA, Mayer KH, Eshleman SH, et al. Correlates of HIV acquisition in a cohort of Black men who have sex with men in the United States: HIV Prevention Trials Network (HPTN) 061. *PLoS ONE.* 2013;8(7):e70413.
4. CDC. Diagnoses of HIV infection and AIDS in the United States and dependent areas, 2010. *HIV Surveill Rep.* 2013;22:1–79.
5. Balaji AB, Bowles KE, Le BC, Paz-Bailey G, Oster AM. High HIV incidence and prevalence and associated factors among young MSM, 2008. *AIDS.* 2013;27(2):269–78.
6. Prejean J, Song R, Hernandez A, et al. Estimated HIV incidence in the United States, 2006–2009. *PLoS ONE.* 2011;6(8):e17502.
7. Latkin C, Weeks MR, Glasman L, Galletly C, Albarracin D. A dynamic social systems model for considering structural factors in HIV prevention and detection. *AIDS Behav.* 2010 Dec;14(Suppl 2):222–38.
8. Maulsby C, Millett G, Lindsey K, et al. HIV among Black men who have sex with men (MSM) in the United States: a review of the literature. *AIDS Behav.* 2014;18(1):10–25.
9. Calabrese SK, Rosenberger JG, Schick VR, Novak DS, Reece M. An event-level comparison of risk-related sexual practices between Black and other-race men who have sex with men: condoms, semen, lubricant, and rectal douching. *AIDS Patient Care STDS.* 2013;27(2):77–84.
10. Millett GA, Peterson JL, Wolitski RJ, Stall R. Greater risk for HIV infection of Black men who have sex with men: a critical literature review. *Am J Public Health.* 2006 Jun;96(6):1007–19.
11. 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):2083–91.
12. 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):341–8.
13. Peterson JL, Jones KT. HIV prevention for Black men who have sex with men in the United States. *Am J Public Health.* 2009 Jun;99(6):976–80.
14. 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):737–44.
15. Kraft JM, Beeker C, Stokes JP, Peterson JL. Finding the “community” in community-level HIV/AIDS interventions: formative research with young African American men who have sex with men. *Health Educ Behav*. 2000;27(4):430–41.
  16. 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.
  17. Teunis N. Sexual objectification and the construction of whiteness in the gay male community. *Cult Health Sex*. 2007;9(3):263–75.
  18. Oster AM, Wejnert C, Mena LA, Elmore K, Fisher H, Heffelfinger JD. Network analysis among HIV-infected young Black men who have sex with men demonstrates high connectedness around few venues. *Sex Transm Dis*. 2013 Mar;40(3):206–12.
  19. Clerkin EM, Newcomb ME, Mustanski B. Unpacking the racial disparity in HIV rates: the effect of race on risky sexual behavior among Black young men who have sex with men (YMSM). *J Behav Med*. 2011;34(4):237–43.
  20. Bland SE, Mimiaga MJ, Reisner SL, et al. Sentencing risk: history of incarceration and HIV/STD transmission risk behaviours among Black men who have sex with men in Massachusetts. *Cult Health Sex*. 2012;14(3):329–45.
  21. Lightfoot MA, Milburn NG. HIV prevention and African American youth: examination of individual-level behaviour is not the only answer. *Cult Health Sex*. 2009 Oct;11(7):731–42.
  22. Dillon PJ, Basu A. HIV/AIDS and minority men who have sex with men: a meta-ethnographic synthesis of qualitative research. *Health Commun*. 2014 Feb;29(2):182–92.
  23. Kelly JA, DiFranceisco WJ, St Lawrence JS, Amirkhanian YA, Anderson-Lamb M. Situational, partner, 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.
  24. Wilton L, Herbst JH, Coury-Doniger P, et al. Efficacy of an HIV/STI prevention intervention for Black men who have sex with men: findings from the Many Men, Many Voices (3MV) project. *AIDS Behav*. 2009;13(3):532–44.
  25. Mannheimer S, Wang L, Tieu HV, et al. Non-adherence to HIV testing guidelines and late HIV diagnosis is common among U.S. Black men who have sex with men (MSM) [abstract]. In: 19th International AIDS conference, Washington, DC, 22–27 July 2012. Abstract number THAB0301.
  26. CDC. Sexually transmitted diseases treatment guidelines, 2010. *Morb Mortal Wkly Rep*. 2010;59(RR-12):1–110.
  27. Mimiaga MJ, Reisner SL, Bland S, et al. Health system and personal barriers resulting in decreased utilization of HIV and STD testing services among at-risk Black men who have sex with men in Massachusetts. *AIDS Patient Care STDS*. 2009;23(10):825–35.
  28. Behel SK, MacKellar DA, Valleroy LA, et al. HIV prevention services received at health care and HIV test providers by young men who have sex with men: an examination of racial disparities. *J Urban Health*. 2008;85(5):727–43.
  29. Hussen SA, Stephenson R, del Rio C, et al. HIV testing patterns among Black men who have sex with men: a qualitative typology. *PLoS ONE*. 2013;8(9):e75382.
  30. Bingham TA, Harawa NT, Johnson DF, Secura GM, MacKellar DA, Valleroy LA. 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, 1999–2000. *AIDS Educ Prev*. 2003;15(1 Suppl A):39–52.
  31. 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):603–14.
  32. CDC. HIV testing among men who have sex with men—21 cities, United States, 2008. *Morb Mortal Wkly Rep*. 2011; 60(21):694–9.
  33. Marks G, Crepaz N, Janssen RS. Estimating sexual transmission of HIV from persons aware and unaware that they are infected with the virus in the USA. *AIDS*. 2006;20(10):1447–50.
  34. Murrill CS, Liu KL, Guilin V, et al. HIV prevalence and associated risk behaviors in New York City’s house ball community. *Am J Public Health*. 2008;98(6):1074–80.
  35. Aral SO, Adimora AA, Fenton KA. Understanding and responding to disparities in HIV and other sexually transmitted infections in African Americans. *Lancet*. 2008;372(9635):337–40.
  36. Berry M, Raymond HF, McFarland W. Same race and older partner selection may explain higher HIV prevalence among Black men who have sex with men. *AIDS*. 2007;21(17):2349–50.
  37. Mayer K, Wang L, Koblin B, et al. Concomitant socioeconomic, behavioral, and biological factors associated with the high HIV infection burden among Black men who have sex with men in 6 U.S. cities. *PLoS One*. 2014;9(1):e87298.
  38. Vernazza PL, Eron JJ, Fiscus SA, Cohen MS. Sexual transmission of HIV: infectiousness and prevention. *AIDS*. 1999;13(2):155–66.
  39. Wasserheit JN. Epidemiological synergy. Interrelationships between human immunodeficiency virus infection and other sexually transmitted diseases. *Sex Transm Dis*. 1992;19(2):61–77.
  40. Scott HM, Pollack L, Rebchook GM, Huebner DM, Peterson J, Kegeles SM. Peer social support is associated with recent HIV testing among young Black men who have sex with men. *AIDS Behav*. 2013. doi:10.1007/s10461-013-0608-8.
  41. 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 Oct;13(9):1103–17.
  42. Lauby JL, Marks G, Bingham T, et al. Having supportive social relationships is associated with reduced risk of unrecognized HIV infection among Black and Latino men who have sex with men. *AIDS Behav*. 2012;16(3):508–15.
  43. DeNavas-Walt C, Proctor BD, Smith JC. U.S. Income, poverty, and health insurance coverage in the United States: 2012. Report number: P60-245. Washington, DC: Census Bureau; 2013.
  44. Dorell CG, Sutton MY, Oster AM, et al. Missed opportunities for HIV testing in health care settings among young African American men who have sex with men: implications for the HIV epidemic. *AIDS Patient Care STDS*. 2011;25(11):657–64.
  45. Ravenell JE, Whitaker EE, Johnson WE Jr. According to him: barriers to healthcare among African-American men. *J Natl Med Assoc*. 2008;100(10):1153–60.
  46. Wenrich MD, Curtis JR, Carline JD, Paauw DS, Ramsey PG. HIV risk screening in the primary care setting. Assessment of physician skills. *J Gen Intern Med*. 1997 Feb;12(2):107–13.
  47. Goyal MK, Dowshen N, Mehta A, Hayes K, Lee S, Mistry RD. Pediatric primary care provider practices, knowledge, and attitudes of human immunodeficiency virus screening among adolescents. *J Pediatr*. 2013 Dec;163(6):1711–5.
  48. Millett GA, Ding H, Marks G, et al. Mistaken assumptions and missed opportunities: correlates of undiagnosed HIV infection among Black and Latino men who have sex with men. *J Acquir Immune Defic Syndr*. 2011;58(1):64–71.
  49. Smith DM, Mathews WC. Physicians’ attitudes toward homosexuality and HIV: survey of a California Medical Society-revisited (PATHH-II). *J Homosex*. 2007;52(3–4):1–9.

50. Tellez C, Ramos M, Umland B, Palley T, Skipper B. Attitudes of physicians in New Mexico toward gay men and lesbians. *J Gay Lesbian Med Assoc.* 1999;3(3):83–9.
51. Montano DE, Phillips WR, Kasprzyk D, Greek A. STD/HIV prevention practices among primary care clinicians: risk assessment, prevention counseling, and testing. *Sex Transm Dis.* 2008;35(2):154–66.
52. Tao G, Irwin KL, Kassler WJ. Missed opportunities to assess sexually transmitted diseases in US adults during routine medical checkups. *Am J Prev Med.* 2000;18(2):109–14.
53. Petroll AE, Mosack KE. Physician awareness of sexual orientation and preventive health recommendations to men who have sex with men. *Sex Transm Dis.* 2011;38(1):63–7.
54. Grodensky CA, Golin CE, Boland MS, Patel SN, Quinlivan EB, Price M. Translating concern into action: HIV care providers' views on counseling patients about HIV prevention in the clinical setting. *AIDS Behav.* 2008;12(3):404–11.
55. Eliason MJ, Schope R. Original research: does “don't ask don't tell” apply to health care? Lesbian, gay, and bisexual people's disclosure to health care providers. *J Gay Lesbian Med Assoc.* 2001;5(4):125–34.
56. Dean L, Meyer IH, Robinson K, et al. Lesbian, gay, bisexual, and transgender health: findings and concerns. *J Gay Lesbian Med Assoc.* 2000;4(3):102–51.
57. Martinez J, Hosek SG. An exploration of the down-low identity: nongay-identified young African-American men who have sex with men. *J Natl Med Assoc.* 2005;97(8):1103–12.
58. Nanin J, Osubu T, Walker J, Powell B, Powell D, Parsons J. “HIV is still real”: perceptions of HIV testing and HIV prevention among Black men who have sex with men in New York City. *Am J Mens Health.* 2009 Jun;3(2):150–64.
59. Hutchinson AB, Begley EB, Sullivan P, Clark HA, Boyett BC, Kellerman SE. Conspiracy beliefs and trust in information about HIV/AIDS among minority men who have sex with men. *J Acquir Immune Defic Syndr.* 2007;45(5):603–5.
60. Malebranche DJ, Peterson JL, Fullilove RE, Stackhouse RW. Race and sexual identity: perceptions about medical culture and healthcare among Black men who have sex with men. *J Natl Med Assoc.* 2004 Jan;96(1):97–107.
61. Magnus M, Kuo I, Phillips G II, et al. Elevated HIV prevalence despite lower rates of sexual risk behaviors among Black men in the District of Columbia who have sex with men. *AIDS Patient Care STDS.* 2010 Oct;24(10):615–22.
62. Bernstein KT, Liu KL, Begier EM, Koblin B, Karpati A, Murrill C. Same-sex attraction disclosure to health care providers among New York City men who have sex with men: implications for HIV testing approaches. *Arch Intern Med.* 2008;168(13):1458–64.
63. Mimiaga MJ, Reisner SL, Goldhammer H, Tetu AM, Belanoff C, Mayer KH. Sources of human immunodeficiency virus and sexually transmitted disease information and responses to prevention messages among Massachusetts men who have sex with men. *Am J Health Promot.* 2010;24(3):170–7.
64. Grant RM, Lama JR, Anderson PL, et al. Preexposure chemoprophylaxis for HIV prevention in men who have sex with men. *N Engl J Med.* 2010;363(27):2587–99.
65. Sullivan P, Liu A, Fuchs J, Irby R, Tarver R, Buchbinder S. Awareness of and intention to use PrEP: a post-iPrEx survey of U.S. MSM [abstract]. In: National HIV prevention conference, Atlanta, GA, 14–17 August 2011. Abstract number 1978.
66. Mansergh G, Koblin BA, Sullivan PS. Challenges for HIV pre-exposure prophylaxis among men who have sex with men in the United States. *PLoS Med.* 2012;9(8):e1001286.
67. Wheeler DP, Fields SD, Borasky D, et al. HPTN 073 pre-exposure prophylaxis (PrEP) initiation and adherence among Black men who have sex with men (BMSM) in three U.S. cities. <http://www.hptn.org/web%20documents/HPTN073/073V121Feb2013.pdf>. Published 21 Feb 2013. Accessed 11 Aug 2013.
68. Malebranche DJ. Black men who have sex with men and the HIV epidemic: next steps for public health. *Am J Public Health.* 2003;93(6):862–5.
69. Wheeler DP. Working with positive men: HIV prevention with Black men who have sex with men. *AIDS Educ Prev.* 2005;17(1 Suppl A):102–15.
70. Ferguson T, Stewart K, Funkhouser E, Tolson J, Westfall A, Saag M. Patient-perceived barriers to antiretroviral adherence: associations with race. *AIDS Care.* 2002;14(5):607–17.
71. Siegel K, Raveis V. Perceptions of access to HIV-related information, care, and services among infected minority men. *Qual Health Res.* 1997;7(1):9–31.
72. Nelson KM, Thiede H, Hawes SE, et al. Why the wait? Delayed HIV diagnosis among men who have sex with men. *J Urban Health.* 2010;87(4):642–55.
73. Tripathi A, Gardner LI, Ogbuanu I, et al. Predictors of time to enter medical care after a new HIV diagnosis: a statewide population-based study. *AIDS Care.* 2011;23(11):1366–73.
74. Fuqua V, Chen YH, Packer T, et al. Using social networks to reach BMSM for HIV testing and linkage to care. *AIDS Behav.* 2012;16(2):256–65.
75. Hightow-Weidman LB, Jones K, Wohl AR, et al. Early linkage and retention in care: findings from the outreach, linkage, and retention in care initiative among young men of color who have sex with men. *AIDS Patient Care STDS.* 2011;25(Suppl 1):S31–8.
76. Traeger L, O'Cleirigh C, Skeer MR, Mayer KH, Safren SA. Risk factors for missed HIV primary care visits among men who have sex with men. *J Behav Med.* 2012;35(5):548–56.
77. Hall HI, Gray KM, Tang T, Li J, Shouse L, Mermin J. Retention in care of adults and adolescents living with HIV in 13 US areas. *J Acquir Immune Defic Syndr.* 2012;60(1):77–82.
78. Axelrad JE, Mimiaga MJ, Grasso C, Mayer KH. Trends in the spectrum of engagement in HIV care and subsequent clinical outcomes among men who have sex with men (MSM) at a Boston community health center. *AIDS Patient Care STDS.* 2013 May;27(5):287–96.
79. Halkitis P, Palamar J, Mukherjee P. Analysis of HIV medication adherence in relation to person and treatment characteristics using hierarchical linear modeling. *AIDS Patient Care STDS.* 2008;22(4):323–35.
80. 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.
81. Oster AM, Wiegand RE, Sionean C, et al. Understanding disparities in HIV infection between Black and White MSM in the United States. *AIDS.* 2011;25(8):1103–12.
82. Oh DL, Sarafian F, Silvestre A, et al. Evaluation of adherence and factors affecting adherence to combination antiretroviral therapy among White, Hispanic, and Black men in the MACS Cohort. *J Acquir Immune Defic Syndr.* 2009;52(2):290–3.
83. Hightow-Weidman LB, Jones K, Phillips G II, Wohl A, Giordano TP. Baseline clinical characteristics, antiretroviral therapy use, and viral load suppression among HIV-positive young men of color who have sex with men. *AIDS Patient Care STDS.* 2011;25(Suppl 1):S9–14.
84. Dombrowski JC, Kerani RP, Stekler JD, Menza T, Golden MR. Antiretroviral therapy use among HIV-infected men who have sex with men attending a sexually transmitted diseases clinic. *J Acquir Immune Defic Syndr.* 2010;55(4):524–7.
85. Bowleg L. “Once you've blended the cake, you can't take the parts back to the main ingredients”: Black gay and bisexual men's descriptions and experiences of intersectionality. *Sex Roles.* 2012;68(11–12):754–67.

86. Battle J, Cohen CJ, Warren D, Fergusson G, Audam S. Say it loud: I'm black and I'm proud: black pride survey 2000. New York: The Policy Institute of the National Gay and Lesbian Task Force; 2002.
87. Berube A. How gay stays White and what kind of White it stays. In: D'Emilio J, Freedman EB, editors. *My desire for history: essays in gay, community, and labor history*. Chapel Hill: The University of North Carolina Press; 2001. p. 234–65.
88. Han CS. They don't want to cruise your type: gay men of color and the racial politics of exclusion. *Soc Ident*. 2007 Jan;13(1):51–67.
89. Choi KH, Han CS, Paul J, Ayala G. Strategies for managing racism and homophobia among U.S. ethnic and racial minority men who have sex with men. *AIDS Educ Prev*. 2011;23(2):145–58.
90. Crawford I, Allison KW, Zamboni BD, Soto T. The influence of dual-identity development on the psychosocial functioning of African-American gay and bisexual men. *J Sex Res*. 2002 Aug;39(3):179–89.
91. Gresham SL. Negotiating cultural contexts: an exploratory investigation of Black gay male strategy employment. *J GLBT Fam Stud*. 2009;5(3):247–67.
92. Han CS, Lauby J, Bond L, Lapollo AB, Rutledge SE. Magic Johnson doesn't worry about how to pay for medicine: experiences of Black men who have sex with men living with HIV. *Cult Health Sex*. 2010;12(4):387–99.
93. Harper GW, Jernewall N, Zea MC. Giving voice to emerging science and theory for lesbian, gay, and bisexual people of color. *Cult Divers Ethn Minor Psychol*. 2004 Aug;10(3):187–99.
94. Warren JC, Fernandez MI, Harper GW, Hidalgo MA, Jamil OB, Torres RS. Predictors of unprotected sex among young sexually active African American, Hispanic, and White MSM: the importance of ethnicity and culture. *AIDS Behav*. 2008;12(3):459–68.
95. Washington P. Who gets to drink from the fountain of freedom? *J Gay Lesbian Soc Serv*. 2001;13(1–2):117–31.
96. Hightow-Weidman LB, Phillips G II, Jones KC, et al. Racial and sexual identity-related maltreatment among minority YMSM: prevalence, perceptions, and the association with emotional distress. *AIDS Patient Care STDS*. 2011;25(Suppl 1):S39–45.
97. Ro A, Ayala G, Paul J, Choi KH. Dimensions of racism and their impact on partner selection among men of colour who have sex with men: understanding pathways to sexual risk. *Cult Health Sex*. 2013;15(7):836–50.
98. Radcliffe J, Doty N, Hawkins LA, Gaskins CS, Beidas R, Rudy BJ. Stigma and sexual health risk in HIV-positive African American young men who have sex with men. *AIDS Patient Care STDS*. 2010 Aug;24(8):493–9.
99. Bogart LM, Wagner GJ, Galvan FH, Klein DJ. Longitudinal relationships between antiretroviral treatment adherence and discrimination due to HIV-serostatus, race, and sexual orientation among African-American men with HIV. *Ann Behav Med*. 2010;40(2):184–90.
100. 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):278–92.
101. Wohl AR, Galvan FH, Carlos JA, et al. A comparison of MSM stigma, HIV stigma and depression in HIV-positive Latino and African American men who have sex with men (MSM). *AIDS Behav*. 2013 May;17(4):1454–64.
102. Herek GM. Beyond "homophobia": thinking about sexual prejudice and stigma in the twenty-first century. *Sex Res Soc Policy*. 2004;1(2):6–24.
103. Egan JE, Frye V, Kurtz SP, et al. Migration neighborhoods and networks: approaches to understanding how urban environmental conditions affect syndemic adverse health outcomes among gay bisexual and other men who have sex with men. *AIDS Behav*. 2011;15(Suppl 1):S35–50.
104. Jerome RC, Halkitis PN. Stigmatization, stress, and the search for belonging in Black men who have sex with men who use methamphetamine. *J Black Psychol*. 2009;35(3):343–65.
105. Ayala G, Bingham T, Kim J, Wheeler DP, Millett GA. Modeling the impact of social discrimination and financial hardship on the sexual risk of HIV among Latino and Black men who have sex with men. *Am J Public Health*. 2012 May;102(Suppl 2):S242–9.
106. Jeffries WL IV, Marks G, Lauby J, Murrill CS, Millett GA. Homophobia is associated with sexual behavior that increases risk of acquiring and transmitting HIV infection among Black men who have sex with men. *AIDS Behav*. 2013;17(4):1442–53.
107. Malebranche DJ, Gvetadze R, Millett GA, Sutton MY. The relationship between gender role conflict and condom use among BMSM. *AIDS Behav*. 2012;16(7):2051–61.
108. Fields EL, Bogart LM, Galvan FH, Wagner GJ, Klein DJ, Schuster MA. Association of discrimination-related trauma with sexual risk among HIV-positive African American men who have sex with men. *Am J Public Health*. 2013;103(5):875–80.
109. Saleh LD, Operario D, Smith CD, Arnold E, Kegeles S. "We're going to have to cut loose some of our personal beliefs": barriers and opportunities in providing HIV prevention to African American men who have sex with men and women. *AIDS Educ Prev*. 2011;23(6):521–32.
110. Jones KT, Johnson WD, Wheeler DP, et al. Nonsupportive peer norms and incarceration as HIV risk correlates for young Black men who have sex with men. *AIDS Behav*. 2008;12(1):41–50.
111. Voisin DR, Bird JD, Shiu CS, Krieger C. "It's crazy being a Black, gay youth." Getting information about HIV prevention: a pilot study. *J Adolesc*. 2013;36(1):111–9.
112. Balaji AB, Oster AM, Viall AH, Heffelfinger JD, Mena LA, Toledo CA. 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):730–7.
113. Sue DW, Capodilupo CM, Holder AMB. Racial microaggressions in the life experience of Black Americans. *Prof Psychol Res Pract*. 2008;39(3):329–36.
114. Earnshaw VA, Chaudoir SR. From conceptualizing to measuring HIV stigma: a review of HIV stigma mechanism measures. *AIDS Behav*. 2009;13(6):1160–77.
115. Herek GM, Capitanio JP. AIDS stigma and sexual prejudice. *Am Behav Sci*. 1999;42(7):1130–47.
116. Vanable PA, Carey MP, Blair DC, Littlewood RA. Impact of HIV-related stigma on health behaviors and psychological adjustment among HIV-positive men and women. *AIDS Behav*. 2006;10(5):473–82.
117. Valdiserri RO. HIV/AIDS stigma: an impediment to public health. *Am J Public Health*. 2002;92(3):341–2.
118. Mahajan AP, Sayles JN, Patel VA, et al. Stigma in the HIV/AIDS epidemic: a review of the literature and recommendations for the way forward. *AIDS*. 2008;22(Suppl 2):S67–79.
119. Herek GM, Capitanio JP, Widaman KF. HIV-related stigma and knowledge in the United States: prevalence and trends, 1991–1999. *Am J Public Health*. 2002;92(3):371–7.
120. Harawa NT, Williams JK, Ramamurthi HC, Bingham TA. Perceptions towards condom use, sexual activity, and HIV disclosure among HIV-positive African American men who have sex with men: implications for heterosexual transmission. *J Urban Health*. 2006 Jul;83(4):682–94.
121. Haile R, Padilla MB, Parker EA. 'Stuck in the quagmire of an HIV ghetto': the meaning of stigma in the lives of older Black gay and bisexual men living with HIV in New York City. *Cult Health Sex*. 2011 Apr;13(4):429–42.



122. Glick SN, Golden MR. Persistence of racial differences in attitudes toward homosexuality in the United States. *J Acquir Immune Defic Syndr*. 2010;55(4):516–23.
123. Lewis GB. Black–White differences in attitudes toward homosexuality and gay rights. *Public Opin Q*. 2003;67(1):59–78.
124. Heath J, Goggin K. Attitudes towards male homosexuality, bisexuality, and the down low lifestyle: demographic differences and HIV implications. *J Bisex*. 2009;9(1):17–31.
125. 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 Jan;103(1):127–33.
126. Dowshen N, Binns HJ, Garofalo R. Experiences of HIV-related stigma among young men who have sex with men. *AIDS Patient Care STDS*. 2009;23(5):371–6.
127. Koblin BA, Husnik MJ, Colfax G, et al. Risk factors for HIV infection among men who have sex with men. *AIDS*. 2006;20(5):731–9.
128. Meade CS, Sikkema KJ. HIV risk behavior among adults with severe mental illness: a systematic review. *Clin Psychol Rev*. 2005;25(4):433–57.
129. Parsons JT, Halkitis PN, Wolitski RJ, Gomez CA, Seropositive Urban Men's Study Team. Correlates of sexual risk behaviors among HIV-positive men who have sex with men. *AIDS Educ Prev*. 2003;15(5):383–400.
130. Salomon EA, Mimiaga MJ, Husnik MJ, et al. Depressive symptoms, utilization of mental health care, substance use and sexual risk among young men who have sex with men in EXPLORE: implications for age-specific interventions. *AIDS Behav*. 2009;13(4):811–21.
131. Semple SJ, Patterson TL, Grant I. Psychosocial predictors of unprotected anal intercourse in a sample of HIV positive gay men who volunteer for sexual risk reduction intervention. *AIDS Educ Prev*. 2000 Oct;12(5):416–30.
132. Strathdee SA, Hogg RS, Martindale SL, et al. Determinants of sexual risk-taking among young HIV-negative gay and bisexual men. *J Acquir Immune Defic Syndr Hum Retrovirol*. 1998;19(1):61–6.
133. Carson EA, Sabol WJ. Prisoners in 2011. Report number 239808. Washington, DC: Bureau of Justice Statistics, U.S. Department of Justice; 2012.
134. Bonczar TP, Beck AJ. Lifetime likelihood of going to state or federal prison. Report number 160092. Washington, DC: Bureau of Justice Statistics, U.S. Department of Justice; 1997.
135. Brewer RA, Magnus M, Kuo I, Wang L, Liu TY, Mayer KH. The high prevalence of incarceration history among Black men who have sex with men (BMSM) in the United States: associations and implications. *Am J Public Health*. 2014;. doi:[10.2105/AJPH.2013.301786](https://doi.org/10.2105/AJPH.2013.301786).
136. Garofalo R, Mustanski B, Johnson A, Emerson E. Exploring factors that underlie racial/ethnic disparities in HIV risk among young men who have sex with men. *J Urban Health*. 2010;87(2):318–23.
137. Lim JR, Sullivan PS, Salazar L, Spaulding AC, Dinunno EA. History of arrest and associated factors among men who have sex with men. *J Urban Health*. 2011;88(4):677–89.
138. Valleroy LA, MacKellar DA, Karon JM, et al. HIV prevalence and associated risks in young men who have sex with men. *J Am Med Assoc*. 2000;284(2):198–204.
139. Maruschak LM. HIV in prisons, 2007–08. Report number 228307. Washington, DC: Bureau of Justice Statistics, U.S. Department of Justice; 2009.
140. McQuillan GM, Kruszon-Moran D, Granade T, Feldman JW. Seroprevalence of human immunodeficiency virus in the US household population aged 18–49 years: the National Health and Nutrition Examination Surveys, 1999–2006. *J Acquir Immune Defic Syndr*. 2010;53(1):117–23.
141. Harawa N, Adimora A. Incarceration, African Americans, and HIV: advancing a research agenda. *J Natl Med Assoc*. 2008;100(1):57–62.
142. Brewer RA, Magnus M, Kuo I, Wang L, Liu TY, Mayer KH. Exploring the relationship between incarceration and HIV among Black men who have sex with men in the United States. *J Acquir Immune Defic Syndr*. 2014;65(2):218–25.
143. Wohl AR, Johnson D, Jordan W, et al. High-risk behaviors during incarceration in African-American men treated for HIV at three Los Angeles public medical centers. *J Acquir Immune Defic Syndr*. 2000;24(4):386–92.
144. CDC. HIV transmission among male inmates in a state prison system—Georgia, 1992–2005. *Morb Mortal Wkly Rep*. 2006;55(15):421–6.
145. Hammett TM, Gaiter JL, Crawford C. Reaching seriously at-risk populations: health interventions in criminal justice settings. *Health Educ Behav*. 1998;25(1):99–120.
146. Myers J, Zack B, Kramer K, Gardner M, Rucobo G, Costa-Taylor S. Get Connected: an HIV prevention case management program for men and women leaving California prisons. *Am J Public Health*. 2005;95(10):1682–4.
147. Maruschak L. HIV in prisons, 2004. Report number 213897. Washington, DC: Bureau of Justice Statistics, U.S. Department of Justice; 2006.
148. Rosen DL, Schoenbach VJ, Wohl DA, White BL, Stewart PW, Golin CE. Characteristics and behaviors associated with HIV infection among inmates in the North Carolina prison system. *Am J Public Health*. 2009;99(6):1123–30.
149. Collica K. The prevalence of HIV peer programming in American prisons: an opportunity wasted. *J Correct Health Care*. 2007;13(4):278–88.
150. CDC. HIV/AIDS education and prevention programs for adults in prisons and jails and juveniles in confinement facilities—United States, 1994. *Morb Mortal Wkly Rep*. 1996;45(13):268–71.
151. Harawa NT, Williams JK, Ramamurthi HC, Manago C, Avina S, Jones M. 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):748–62.
152. Braithwaite RL, Arriola KR. Male prisoners and HIV prevention: a call for action ignored. *Am J Public Health*. 2003;93(5):759–63.
153. Hammett TM. HIV/AIDS and other infectious diseases among correctional inmates: transmission, burden, and an appropriate response. *Am J Public Health*. 2006;96(6):974–8.
154. Pierce SJ, Miller RL, Morales MM, Forney J. Identifying HIV prevention service needs of African American men who have sex with men: an application of spatial analysis techniques to service planning. *J Public Health Manag Pract*. 2007;Suppl:S72–9.
155. Koblin BA, Tieu HV, Frye V. Disparities in HIV/AIDS in Black men who have sex with men. *Lancet*. 2012;380(9839):316–8.
156. Morenoff JD, Sampson RJ, Raundebush SW. Neighborhood inequality, collective efficacy, and the spatial dynamics of urban violence. *Criminology*. 2001;39(3):517–58.
157. Aud S, Hussar W, Johnson F, et al. The condition of education 2012. Report number 2012-045. Washington, DC: National Center for Education Statistics, U.S. Department of Education; 2012.
158. Robinson BB, Galbraith JS, Swinburne Romine RE, Zhang Q, Herbst JH. Differences between HIV-positive and HIV-negative African American men who have sex with men in two major U.S. metropolitan areas. *Arch Sex Behav*. 2013;42(2):267–78.

159. Myers HF, Javanbakht M, Martinez M, Obediah S. Psychosocial predictors of risky sexual behaviors in African American men: implications for prevention. *AIDS Educ Prev*. 2003;15(1 Suppl A):66–79.
160. Wilton L. Men who have sex with men of color in the age of AIDS: the sociocultural contexts of stigma, marginalization, and structural inequalities. In: Stone V, et al., editors. *HIV/AIDS in US communities of color*. New York: Springer Publications; 2009. p. 179–211.
161. Sheon N, Lee SH, Facente S. From questionnaire to conversation: a structural intervention to improve HIV test counseling. *Patient Educ Couns*. 2010;81(3):468–75.
162. Fullilove RE, Green L, Fullilove MT. The Family to Family program: a structural intervention with implications for the prevention of HIV/AIDS and other community epidemics. *AIDS*. 2000;14(Suppl 1):S63–7.
163. Adimora AA, Auerbach JD. Structural interventions for HIV prevention in the United States. *J Acquir Immune Defic Syndr*. 2010;55(Suppl 2):S132–5.
164. Brown L, Macintyre K, Trujillo L. Interventions to reduce HIV/AIDS stigma: what have we learned? *AIDS Educ Prev*. 2003;15(1):49–69.
165. Gupta GR, Parkhurst JO, Ogden JA, Aggleton P, Mahal A. Structural approaches to HIV prevention. *Lancet*. 2008;372(9640):764–75.
166. Wittenberg A, Gerber J. Recommendations for improving sexual health curricula in medical schools: results from a two-arm study collecting data from patients and medical students. *J Sex Med*. 2009 Feb;6(2):362–8.
167. Bluespruce J, Dodge WT, Grothaus L, et al. HIV prevention in primary care: impact of a clinical intervention. *AIDS Patient Care STDS*. 2001;15(5):243–53.
168. Dodge WT, Bluespruce J, Grothaus L, et al. Enhancing primary care HIV prevention: a comprehensive clinical intervention. *Am J Prev Med*. 2001;20(3):177–83.
169. Purcell DW, McCree DH. Recommendations from a research consultation to address intervention strategies for HIV/AIDS prevention focused on African Americans. *Am J Public Health*. 2009;99(11):1937–40.
170. Moyer VA, LeFevre ML, Siu AL, et al. Screening for HIV: U.S. Preventive Services Task Force recommendation statement. *Ann Intern Med*. 2013;159(1):51–60.
171. United States Department of Health and Human Services, Office of Population Affairs. Affordable Care Act. 2010. <http://www.gpo.gov/fdsys/pkg/PLAW-111publ148/pdf/PLAW-111publ148.pdf>. Accessed 7 Dec 2013.
172. Jones J, Rasch R, MacMaster S, Adams S, Cooper RL. The experiences of African American male commercial sex workers at-risk for HIV: accessing outreach services. *J Gay Lesbian Soc Serv*. 2009;21(2–3):282–93.
173. Lechuga J, Owczarzak JT, Petroll AE. Marketing the HIV test to MSM: ethnic differences in preferred venues and sources. *Health Promot Pract*. 2013 May;14(3):433–40.
174. McKirnan DJ, Du Bois SN, Alvy LM, Jones K. Health care access and health behaviors among men who have sex with men: the cost of health disparities. *Health Educ Behav*. 2013;40(1):32–41.
175. Schneider JA, Walsh T, Cornwell B, Ostrow D, Michaels S, Laumann EO. HIV health center affiliation networks of Black men who have sex with men: disentangling fragmented patterns of HIV prevention service utilization. *Sex Transm Dis*. 2012 Aug;39(8):598–604.
176. Scott HM, Fuqua V, Raymond HF. Utilization of HIV prevention services across racial/ethnic groups among men who have sex with men in San Francisco, California, 2008. *AIDS Behav*. 2013 May; doi:10.1007/s10461-013-0526-9.
177. Bogart LM, Landrine H, Galvan FH, Wagner GJ, Klein DJ. Perceived discrimination and physical health among HIV-positive Black and Latino men who have sex with men. *AIDS Behav*. 2013;17(4):1431–41.
178. Overstreet NM, Earnshaw VA, Kalichman SC, Quinn DM. Internalized stigma and HIV status disclosure among HIV-positive Black men who have sex with men. *AIDS Care*. 2013;25(4):466–71.
179. Wohl AR, Galvan FH, Myers HF, et al. Do social support, stress, disclosure and stigma influence retention in HIV care for Latino and African American men who have sex with men and women? *AIDS Behav*. 2011;15(6):1098–110.
180. Mutchler MG, Bogart LM, Elliott MN, McKay T, Suttrop MJ, Schuster MA. Psychosocial correlates of unprotected sex without disclosure of HIV-positivity among African-American, Latino, and White men who have sex with men and women. *Arch Sex Behav*. 2008;37(5):736–47.