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The Associations of Incarceration and Depression with Healthcare Experiences and Utilization among Black Men who Have Sex with Men in HPTN 061

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Abstract

Associations of incarceration with healthcare access and utilization among Black sexual minority men (BSMM) and differences in association among those with and without pre-incarceration symptoms of depression were measured. Secondary analysis using survey data from the longitudinal cohort HIV Prevention Trials Network 061 study was conducted among 1553 BSMM from six major U.S. cities from 2009 to 2011. We used modified log-binomial regression with robust standard errors to estimate associations of incarceration (reported at 6 month follow-up) on next six month healthcare utilization and access (reported at the 12 month follow-up). We tested the significance of baseline depressive symptoms by incarceration interaction and reported differences in associations when observed. Participants with a history of incarceration were more likely to have depressive symptoms at baseline compared to those without. Recent incarceration was associated with almost twice the risk of mistrust in healthcare providers and emergency room utilization. Among men reporting depressive symptoms, a history of incarceration was associated with almost tripled risk of reporting providers do not communicate understandably. Among those with depression, one in five reported a missed visit regardless of incarceration status.

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Keywords

health care utilization; Black sexual minority men; incarceration; depression; health care access

Introduction

It is estimated that one in two Black sexual minority men (BSMM) in the United States will be diagnosed with HIV in their lifetime (National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention, 2016). In 2018, BSMM accounted for 26% of all new HIV diagnoses nationally even though BSMM engage in less risky sexual behavior and substance use compared to White SMM (CDC, 2020; Millett, Peterson, et al., 2007; Maulsby et al., 2014; Millett, Flores, et al., 2007; Magnus et al., 2010). However, BSMM are less likely than White SMM to adhere to antiretroviral therapy, with only 57% achieving viral suppression (CDC, 2020; Millett, Peterson, et al., 2007; Maulsby et al., 2014). Reasons for these health inequities include structural barriers BSMM may face such as healthcare access, stigma, discrimination, and a lack of cultural competency among healthcare providers (CDC, 2020; Levy et al., 2017). Optimal HIV prevention and clinical outcomes are achieved through frequent testing, use of pre-exposure prophylaxis (PrEP) taken to reduce risk of HIV acquisition, promotion of condom use, and initiation and adherence to antiretroviral therapy—all of which require adequate healthcare access and utilization (Stahlman et al., 2017; Rowell-Cunsolo et al., 2016).

Incarceration is a traumatic life event that disrupts care and increases structural barriers to healthcare access. Mass incarceration is driven by structural factors relating to systemic racism inherent in the criminal justice system (National Resource Council, 2014). Despite composing only 13% of the total U.S. population, Black men make up 60% of the male prison population (Brewer et al., 2014a). BSMM also report high prevalence of incarceration (Brewer et al., 2014b; Meyer et al., 2017). During re-entry into the community, individuals face multidimensional challenges including lack of employment, unstable housing, and disrupted social relationships that exacerbate the aforementioned barriers (Hammett et al., 2001). For those living with HIV who have been recently released from incarceration, increased emergency room (ER) utilization as well as discontinuity of ART due to loss of Medicaid access and competing survival demands during re-entry have been observed. Other obstacles to post-release healthcare access include judgmental and stigmatizing interactions with providers (Hammett et al., 2001; Shavit et al., 2017; Turan et al., 2019).

Incarceration is also associated with anxiety and mood disorders (Schnittker et al., 2012). Furthermore, previous reports have found one in three BSMM have depressive symptoms (Cochran & Mays, 1994). Depressive disorders are often negatively associated with healthcare utilization; for example, depression has been linked to missed primary care visits and increased healthcare spending (Traeger et al., 2012; Carrico et al., 2011; Joyce et al., 2005). Recent attention to intersectional and syndemic perspectives have explored pathways to HIV risk that are related to stigma, discrimination, incarceration, and depression in various combinations (National Resource Council, 2014; Brewer et al., 2014a; Brewer et al., 2014b; Meyer et al., 2017; Koblin et al., 2013; Choi et al., 2013; Graham et al., 2011;

Batchelder et al., 2017; Trinh et al., 2017; McKirnan et al., 2013; Frank et al., 2014; Kanny et al., 2019; Turpin et al., 2020). However, there is a lack of information regarding the synergistic effects of these factors on healthcare access and utilization among BSMM.

The goal of this paper is to examine how incarceration, depressive symptoms, and their interactions are associated with healthcare access and utilization among a national sample of BSMM. Specifically, we examine the effect of recent incarceration on a range of subsequent forms of healthcare utilization and examine whether associations were exacerbated among those with more depressive symptoms.

Methods

Study Sample and Design

The enrollment and recruitment procedures used in the HIV Prevention Trials Network (HPTN) 061 study have been described previously (Koblin et al., 2013). HPTN 061 sought to understand the feasibility and acceptability of HIV transmission prevention strategies among BSMM and enrolled 1553 participants in six US cities: Atlanta, Boston, Los Angeles, New York City, San Francisco, and Washington D.C. Participants were eligible to enroll in the study if they were 18 years of age or older, self-identified as a man or male at birth, identified as Black, African American, Caribbean Black, or multiethnic Black, and reported one or more unprotected anal intercourse events with a male partner in the six months prior (Koblin et al., 2013). Once enrolled in the study, participants were given a baseline survey that assessed demographics, incarceration history, HIV risk, depressive symptoms, and healthcare experiences. Surveys were administered again at six and 12 months after baseline. Data collection began in 2009 and follow-up concluded in 2011. Institutional review boards at all participating institutions approved the study; New York University Grossman School of Medicine does not consider the current secondary analysis of de-identified data to be human subjects research.

Participants were excluded if the number of missing items exceeded 20%, information regarding recent incarceration was missing, and their HIV status was unknown. Therefore, of the 1553 participants interviewed at baseline, 1169 were used in the analytic sample.

Measures

Incarceration—Participants self-reported the frequency of which they had spent one or more nights in jail or prison between the baseline and the six-month follow-up surveys. Participants reporting that they had spent one or more nights incarcerated during that six-month period were considered recently incarcerated.

Healthcare Experience, Support, and Utilization—At the 12-month follow-up visit, participants reported on experiences with and use of the healthcare system in the past six months. On a five-point Likert-type scale, participants responded to the questions, “I trust my healthcare provider” and “My provider talks to me in a way I understand,” and “Is there anybody who would go to a medical appointment with you?” These were each dichotomized as strongly disagree/disagree vs neither agree or disagree/agree/strongly agree to measure distrust and being spoken to in a way they do not understand. Participants also reported on

use of the healthcare system in the past six months, including missing at least half of their healthcare appointments, visiting a healthcare provider, and visiting an ER.

Depressive Symptoms—At the baseline survey, depressive symptoms were measured using the Centers for Epidemiologic Studies – Depression scale; participants were considered to have depressive symptoms if their score was ≥16 (Radloff, 1977).

Covariates—Variables used in estimating inverse probability weights were measured at the baseline survey. This included self-reported age; transgender identity; currently having unstable housing; high school education or less; any hard drug use (i.e., heroin, crack/cocaine, methamphetamine, prescription misuse, or other drugs) in the past six months; weekly marijuana use; insufficient income in the past six months; current health coverage; prior lifetime incarceration; AUDIT (Alcohol Use Disorders Identification Test) score; experience of physical and/or threatened violence due to race and/or sexuality (Saunders et al., 1993); perceived racism and perceived homophobia measured with the RaLES scale (Harrell, 1994); internalized homophobia using items adapted from Herek and Glunt (1998); sex with female partners in the past six months; having ever received HIV testing; transactional sex in the past six months; multiple partnership categorized as having greater than 3 partners (i.e., the median number of partners); concurrent partnership, which is defined as having partners plus their primary partner in the past six months; cohabiting with a primary partner; HIV status (rapid testing with confirmation via Western blot at study sites and retrospective testing at the HPTN Laboratory Center for quality assurance); and STI infection (syphilis, gonorrhea, or chlamydia ascertained from blood, urine, and rectal swab testing).

Statistical Analyses

We used R version 3.6.2 for analyses (R Core Team, 2018). If more than 20% of items were missing on a scale, we considered the scale as missing. If less than 20% of items were missing on a scale, the scale score was calculated as the mean of the non-missing items (Downey & King, 1998). Of the 1169 participants in the analytic sample, approximately 68% were missing data on at least one covariate, and multiple imputation was used to reduce bias and increase power in the analyses by imputing data 70 times using predictive mean matching in the “mice” package (van Buuren, 2018).

Inverse probability of treatment weights (IPTW) were estimated to adjust for measured confounding by baseline variables. The propensity of the exposure (i.e., recent incarceration) was estimated with logistic regression using the Ridge penalty, conditional on the aforementioned covariates. The weights were stabilized using the marginal probability of the observed exposure (Hernán & Robins, 2006). Weights were estimated separately for each of the seventy imputed datasets.

We measured the frequency and prevalence of each covariate by baseline depressive symptoms and by mistrust in healthcare providers, using Chi-Squared tests to assess differences. We also estimated the unadjusted risk ratios for associations between the covariates, depressive symptoms, and mistrust in providers. To estimate the associations between recent incarceration and each of the healthcare experience and use outcomes, we

used modified log-binomial regression with robust standard errors, conducted in each of the imputed datasets. Parameter estimates and variances were extracted from each model, and were pooled to obtain unadjusted and adjusted risk ratios and standard errors for the association between recent incarceration and healthcare outcomes following Rubin's rules (Rubin, 2011). We used the "emmeans" package from R to obtain unadjusted and adjusted simple risk ratios by baseline depression for each healthcare experience and use outcome, estimating the standard errors via the Delta Method; log risk ratios were averaged, and pooled standard errors were calculated via Rubin's rules and used to construct a 95% confidence interval (Rubin, 2011).

Results

Participant Characteristics Associated with Depressive Symptoms

In total, 1169 BSMM were included in our analytic sample, with 37% (n=429) reporting depressive symptoms (Table 1). Participants were on average 37.7 years of age. 40% of those with less than a high school education reported depressive symptoms compared to approximately 33% among those with higher education levels (RR 1.38, 95% CI: 1.19, 1.59, $p < 0.001$). Similarly, insufficient income (sufficient income: RR 0.68, 95% CI: 0.59, 0.80, $p < 0.001$) and unstable housing (RR 1.32, 95% CI: 1.0.7, 1.61, $p = 0.008$) were associated with depressive symptoms. Men who have sex with men only had less risk of reporting depressive symptoms than men who have sex with men and women (RR 0.81, 95% CI: 0.70, 0.94, $p = 0.004$).

Participants who reported having ever been incarcerated at baseline had greater risk of reporting depressive symptoms (39.5%) compared to those who had no history of incarceration (32.9%; RR 1.24, 95% CI: 1.07, 1.45, $p = 0.006$). Those who had experienced violence in their lifetime also had greater risk of reporting depressive symptoms (RR 1.64, 95% CI: 1.33, 2.01, $p < 0.001$).

The risk of depressive symptoms was higher in those with hard drug use compared to those without (RR 1.24, 95% CI: 1.08, 144, $p = 0.003$). The risk of depressive symptoms was over 50% greater for those who scored at least an 8 on the AUDIT screening compared to those who did not (RR 1.58, 95% CI: 1.37,1.83, $p < 0.001$).

Participant Characteristics Associated with Mistrust in Healthcare Providers

In total, almost 16% (n=184) participants noted mistrust in healthcare providers (Table 2). 18% of participants having less than a high school education noted distrust compared with 13% reporting mistrust among those having at least a high school education (RR 1.35, 95% CI: 1.03, 1.76, $p = 0.031$).

Those who had ever been incarcerated had greater risk of reporting provider mistrust (RR 1.38, 95% CI: 1.03, 2.06, $p = 0.033$). Risk of reporting provider mistrust was greater for those involved in multiple partnerships compared to those not involved in multiple partnerships (RR 1.53, 95% CI: 1.17,1.99, $p = 0.002$) but was less among men who have sex with men only compared to men who have sex with men and women (RR 0.54, 95% CI: 0.41,0.70, $p < 0.001$).

Incarceration and Healthcare Experience and Network Support by Depressive Symptoms

In adjusted analyses, those with a history of recent incarceration had almost twice the risk of mistrust in their healthcare providers than those without recent incarceration (adjusted risk ratio [ARR] 1.87, 95% CI: 1.26, 2.79; Table 3). This association was augmented among men with a history of incarceration (ARR 2.26, 95% CI: 1.41, 3.63). Among men reporting depressive symptoms, 28% of those with a recent incarceration reported providers do not communicate in a way that can be understood versus 9% of those with no recent incarceration (ARR 2.93, 95% CI: 1.82, 4.71), while among men with no depressive symptoms there was limited evidence of an association between incarceration and provider communication (ARR 1.30, 95% CI: 0.64, 2.65). There was little evidence of an association between recent incarceration and lack of network support for attending medical visits (ARR 1.14, 95% CI: 0.81, 1.61).

Incarceration and Healthcare Utilization by Depressive Symptoms

Among all participants, regardless of depressive symptom status, recent incarceration predicted twice the risk of ER utilization (ARR 1.94, 95% CI: 1.10, 3.41). Incarceration also was associated with seeing a provider after release among those with no depressive symptoms (ARR 1.22, 95% CI: 1.06, 1.40) but not among those with depressive symptoms (ARR 0.99, (0.80, 1.22; incarceration by depression interaction term $p = 0.099$). Among those with no depressive symptoms at baseline, 22% who had a recent incarceration a missed post-release healthcare visits versus 20% of those with no incarceration history (ARR 1.14, 95% CI: 0.81, 1.61), while among those with depression over one in five reported a missed visit regardless of incarceration status (ARR 0.83, 95% CI: 0.50, 1.38; incarceration by depression interaction term $p = 0.087$).

Discussion

In this sample of BSMM from six US cities, when adjusting for a robust set of confounders, recent incarceration was a strong independent predictor of mistrust of providers, perception that providers did not speak in a way that could be understood, increased reliance on the ER for healthcare, and increased disruptions in care. The findings highlight the vulnerability of BSMM to diminished care engagement after incarceration. This points to the need to reach BSMM with compassionate, culturally competent care. This study also examined co-occurrence of incarceration with depressive symptoms given the high burden of depression in BSMM. We observed the association between incarceration and healthcare experience and utilization varied by status of depressive symptoms. Among BSMM with depressive symptoms, recent incarceration was associated with over a doubling of the risk of perception of poor provider communication. However, we also observed the associations of incarceration with some care utilization indicators such as missed visits were stronger in those without symptoms of depression, because discontinuity of care was very common among BSMM with depressive symptoms including those with and without a recent incarceration. Taken together, the findings highlight the particular need for intensive re-entry planning with incarcerated BSMM with depressive symptoms at the time of incarceration, to support post-release linkage to care for mental health and co-occurring conditions such as substance use.

These findings corroborate prior studies that have highlighted the negative influence of incarceration on care engagement in other US samples (Rowell-Cunsolo, 2016; Frank et al., 2014). At baseline, BSMM face barriers to care healthcare providers due to perception of stigma of homosexuality (Kanny et al., 2019). The stigmatization of being Black, a sexual minority, and mentally ill may be exacerbated by justice-involvement to further reduce trust in care systems. Further, those who are incarcerated may have negative interactions with healthcare providers during incarceration (Clark et al., 2017; Plugge & Fitzpatrick, 2008; Howerton et al., 2007; Laitila et al., 2018).

Our study is among the first to investigate the simultaneous effects of depression and incarceration on healthcare experiences and utilization within a sample of BSMM, a population that may be particularly vulnerable to these negative experiences (Brewer et al., 2014b; Meyer et al., 2017; Carrico et al., 2011; Choi et al., 2013; Graham et al., 2011; Batchelder et al., 2017). We found that depressive symptoms among BSMM may alter the effect of recent incarceration on subsequent healthcare experiences and utilization, though in seemingly different ways. This may serve as additional intersecting stigmatized aspects of one's life that adversely affect one's ability to trust and communicate openly with their healthcare providers (Howerton et al., 2007; Knaak et al., 2017).

This study has several limitations. This study sampled a population of BSMM in six major U.S. cities, and therefore cannot be generalized to all BSMM. Measurements for the number of missed visits and having seen a healthcare provider may rely on false equivalencies. For instance, if one participant has been scheduled for multiple follow-ups and referrals for a set of conditions, missing half of his scheduled visits is different from another participant who may have missed the one routine appointment during this same time frame. The number of ER visits in the past six months was not recorded, which may have illuminated reliance on the ER for healthcare. Finally, this study did not investigate specific forms of stigma (e.g. racial, homophobic stigma) which may be encountered in healthcare settings by BSMM and those with a history of incarceration that may drive mistrust in providers (Stahlman et al., 2017).

Our findings underscore the need to improve healthcare accessibility for those impacted by incarceration, including BSMM. The Transitions Clinic Network model utilizes trained community health workers to act as an advocate for individuals returning from prison, and has been shown to reduce ER use and increase attendance at primary care appointments after release (Shavit et al., 2017). A second intervention approach aims at addressing stigma within the healthcare system to improve attitudes of healthcare providers (Turan et al., 2019). Lastly, the Prison Abolition Movement advocates for the reallocation of resources from prisons to those supporting education, healthcare, and other public services (Davis and Rodriguez, 2000). Addressing the underlying social inequalities that lead to involvement in the criminal justice system and ensuring the compassionate reentry of previously incarcerated individuals into society would render mass incarceration obsolete (Keller, 2019).

Our results indicate that incarceration and depressive symptoms are associated with greater barriers to access, utilization, trust, and communication related to healthcare among BSMM,

and hence may be important drivers of negative health outcomes in this population. This study presents a potential pathway by which BSMM may then experience poorer health outcomes driven by negative experiences and lack of access to the healthcare system. Findings suggest that an intersectional and syndemic lens may be most beneficial for healthcare providers and public health leaders to use when creating prevention and treatment strategies for BSMM patients.

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Table 1

Prevalence of Baseline Characteristics and Associations with Depressive Symptoms among Black Sexual Minority Men in HPTN 061 (N=1169)

Characteristic at Baseline	N (%) (N=1169)	N (%) with Depressive Symptoms[a] (N=429)	Risk Ratio(95% CI)	P value*
Age				
Mean (SD)	37.7 (11.8)	37.3 (11.4)		0.942
Median [Min, Max]	39.0 [18.0, 68.0]	39.0 [18.0, 63.0]	1.00 (0.99 1.01)	
Education				
Vocational/College	568 (48.6)	187 (32.9)	Referent	
Less than High School	601 (51.4)	242 (40.3)	1.38 (1.19, 1.59)	<0.001
City				
Atlanta	207 (17.7)	76 (36.7)	Referent	
NYC	256 (21.9)	87 (34.0)	0.89 (0.70, 1.13)	0.335
Washington, D.C.	177 (15.1)	62 (35.0)	0.91 (0.71, 1.18)	0.492
Boston	173 (14.8)	72 (41.6)	1.22 (0.97, 1.54)	0.093
LA	207 (17.7)	75 (36.2)	0.94 (0.74, 1.21)	0.646
San Francisco	149 (12.7)	57 (38.3)	1.02 (0.79, 1.32)	0.886
Incarcerated ever				
No	465 (39.8)	153 (32.9)	Referent	
Yes	686 (58.7)	271 (39.5)	1.24 (1.07, 1.45)	0.006
Experienced police harassment due to race or sexuality				
No	155 (13.3)	50 (32.3)	Referent	
Yes	991 (84.8)	378 (38.1)	1.24 (0.98, 1.56)	0.080
Experienced Violence				
No	284 (24.3)	75 (26.4)	Referent	
Yes	690 (74.1)	353 (40.8)	1.64 (1.33, 2.01)	<0.001
Insufficient income				
No	513 (43.9)	156 (30.4)	Referent	
Yes	655 (56.0)	273 (41.7)	0.68 (0.59, 0.80)	<0.001
Unstable Housing				
No	1055 (90.2)	379 (35.9)	Referent	
Yes	113 (9.7)	50 (44.2)	1.32 (1.07, 1.61)	0.008
Ever tested for HIV				
No	140 (12.0)	63 (45.0)	Referent	
Yes	1028 (87.9)	366 (35.6)	0.80 (0.66, 0.96)	0.018
Healthcare Coverage				
No	456 (39.0)	176 (38.6)	Referent	
Yes	712 (60.9)	253 (35.5)	0.93 (0.81, 1.08)	0.356
Multiple partnership				
No	673 (57.6)	223 (33.1)	Referent	
Yes	494 (42.3)	206 (41.7)	1.30 (1.13, 1.50)	<0.001

Characteristic at Baseline	N (%) (N=1169)	N (%) with Depressive Symptoms[a] (N=429)	Risk Ratio(95% CI)	P value*
MSMW Status				
MSMW[b]	511 (43.7)	196 (45.7)	Referent	
MSMO[c]	657 (56.2)	233 (54.3)	0.81 (0.70, 0.94)	0.004
Any STI				
No	1010 (86.4)	373 (36.9)	Referent	
Yes	138 (11.8)	50 (36.2)	0.92 (0.73, 1.16)	0.500
HIV status at baseline				
Negative	935 (80.0)	340 (36.4)	Referent	
Positive	214 (18.3)	82 (38.3)	1.08 (0.90, 1.29)	0.406
HIV+ acute	3 (0.3)	1 (33.3)	0.80 (0.16, 3.99)	0.788
Unknown	16 (1.4)	6 (37.5)	0.96 (0.52, 1.80)	0.907
Hard drug use[d]				
No	651 (55.7)	225 (34.6)	Referent	
Yes	471 (40.3)	192 (40.8)	1.24 (1.08, 1.44)	0.003
AUDIT ≥8				
No	766 (65.5)	240 (31.3)	Referent	
Yes	357 (30.5)	174 (48.7)	1.58 (1.37, 1.83)	<0.001

*P-values from Chi-square test of independence

[a]Depressive symptoms measured at baseline with CES score ≥16

[b]Men who have sex with men and women

[c]Men who have sex with men only

[d]Heroin, crack/cocaine, methamphetamine, prescription misuse, or other drugs

Table 2

Prevalence of Baseline Characteristics by Mistrusts in Healthcare Providers among Black Sexual Minority Men in HPTN 061 (N=1169)

Characteristic at Baseline	N (N=1169)	N (%) with mistrust in healthcare provider[a] (N=184)	Risk Ratio(95% CI)	P value*
Age				
Mean (SD)	37.7 (11.8)	39.1 (11.4)		
Median [Min, Max]	39.0 [18.0, 68.0]	42.5 [18.0, 61.0]	1.01 (1.00, 1.02)	0.075
Education				
Vocational/College	568 (48.6)	76 (13.4)	Referent	
Less than High School	601 (51.4)	108 (18.0)	1.35 (1.03, 1.76)	0.031
City				
Atlanta	207 (17.7)	25 (12.1)	Referent	
NYC	256 (21.9)	25 (12.1)	1.60 (1.03, 2.49)	0.038
Washington	177 (15.1)	17 (9.6)	0.79 (0.44, 1.42)	0.434
Boston	173 (14.8)	27 (15.6)	1.31 (0.79, 2.17)	0.292
LA	207 (17.7)	41 (19.8)	1.62 (1.03, 2.57)	0.038
San Francisco	149 (12.7)	24 (16.1)	1.33 (0.79, 2.24)	0.279
Incarcerated ever				
No	465 (39.8)	60 (12.9)	Referent	
Yes	686 (58.7)	121 (17.6)	1.38 (1.03, 1.83)	0.029
Experienced police harassment due to race or sexuality				
No	155 (13.3)	19 (12.3)	Referent	
Yes	991 (84.8)	160 (16.1)	1.32 (0.85, 2.06)	0.217
Experienced Violence				
No	284 (24.3)	37 (13.0)	Referent	
Yes	866 (74.1)	145 (16.7)	1.29 (0.92, 1.81)	0.134
Insufficient income				
No	513 (43.9)	77 (15.0)	Referent	
Yes	655 (56.0)	107 (16.3)	0.91 (0.70, 1.20)	0.509
Unstable Housing				
No	1055 (90.2)	165 (89.7)	Referent	
Yes	113 (9.7)	19 (10.3)	1.11 (0.72, 1.70)	0.651
Ever tested for HIV				
No	140 (12.0)	26 (14.1)	Referent	
Yes	1028 (87.9)	158 (85.9)	0.84 (0.58, 1.22)	0.357
Healthcare Coverage				
No	456 (39.0)	68 (37.0)	Referent	
Yes	712 (60.9)	116 (63.0)	1.09 (0.83, 1.44)	0.527
Multiple partnership				
No	673 (57.6)	87 (47.3)	Referent	
Yes	494 (42.3)	97 (52.7)	1.53 (1.17, 1.99)	0.002

Characteristic at Baseline	N (N=1169)	N (%) with mistrust in healthcare provider[a] (N=184)	Risk Ratio(95% CI)	P value[*]
MSMW status				
MSMW[b]	511 (43.7)	109 (59.2)	Referent	
MSMO[c]	657 (56.2)	75 (40.8)	0.54 (0.41, 0.70)	<0.001
Any STI				
No	1010 (86.4)	159 (86.4)	Referent	
Yes	138 (11.8)	23 (12.5)	1.07 (0.72, 1.60)	0.734
HIV status at baseline				
Negative	935 (80.0)	144 (78.3)	Referent	
Positive	214 (18.3)	38 (20.7)	1.15 (0.83, 1.59)	0.400
HIV+ acute	3 (0.3)	0	0.00 (0.00, 0.00)	0.000
Unknown	16 (1.4)	2 (1.1)	0.86 (0.23, 3.14)	0.814
Hard drug use[d]				
No	651 (55.7)	92 (50.0)	Referent	
Yes	471 (40.3)	78 (42.4)	1.18 (0.89, 1.56)	0.240
AUDIT ≥8				
No	766 (65.5)	90 (14.5)	Referent	
Yes	357 (30.5)	44 (15.3)	1.05 (0.78, 1.41)	0.753

[*] P-values from Chi-square test of independence

[a] Mistrust in healthcare measured at baseline

[b] Men who have sex with men and women

[c] Men who have sex with men only

[d] Heroin, crack/cocaine, methamphetamine, prescription misuse, or other drugs

Table 3

Associations between Recent Incarceration, Healthcare Experiences and Utilization, by Depressive Symptoms among Black Sexual Minority Men in HPTN 061 (N=1169)

	Total Sample (N=1169)			Among Those without Depressive Symptoms at Baseline (N=740)			Among Those with Depressive Symptoms[a] at Baseline (N=429)			
Outcome	**N (%) with Outcome**	**Unadjusted RR (95% CI)**	**Adjusted RR (95% CI)**	**N (%) with Outcome**	**Unadjusted RR (95% CI)**	**Adjusted RR (95% CI)**	**N (%) with Outcome**	**Unadjusted RR (95% CI)**	**Adjusted RR (95% CI)**	**P-value* (Adjusted)**
Does Not Trust Healthcare providers										
No Recent Incarceration	107 (10.7)	Referent	Referent	42 (8.1)	Referent	Referent	42 (11.7)	Referent	Referent	
Recent Incarceration	35 (21.1)	2.09 (1.45, 3.02)	1.87 (1.26, 2.79)	10 (14.1)	1.74 (0.98, 3.09)	1.36 (0.71, 2.60)	20 (29.0)	2.21 (1.42, 3.49)	2.26 (1.41, 3.63)	0.505 (0.200)
Healthcare Providers do not Talk to Me in a Way I Understand										
No Recent Incarceration	93 (9.3)	Referent	Referent	43 (8.3)	Referent	Referent	33 (9.2)	Referent	Referent	
Recent Incarceration	30 (18.2)	2.10 (1.41, 3.14)	2.12 (1.41, 3.19)	7 (9.9)	1.20 (0.60, 2.40)	1.30 (0.64, 2.65)	19 (27.5)	2.80 (1.75, 4.48)	2.93 (1.82, 4.71)	0.035 (0.054)
Has No Medical Network [b]										
No Recent Incarceration	131 (13.0)	Referent	Referent	55 (10.6)	Referent	Referent	61 (16.9)	Referent	Referent	
Recent Incarceration	34 (20.6)	1.45 (0.99, 2.13)	1.13 (0.72, 1.75)	15 (21.1)	1.87 (1.16, 3.03)	1.34 (0.75, 2.39)	15 (21.7)	1.11 (0.64, 1.94)	0.94 (0.51, 1.74)	0.146 (0.393)
Missed Less than Half or More Scheduled Healthcare Visits										
No Recent Incarceration	200 (19.9)	Referent	Referent	74 (14.2)	Referent	Referent	87 (24.2)	Referent	Referent	
Recent Incarceration	37 (22.4)	1.13 (0.83, 1.53)	1.14 (0.81, 1.61)	19 (26.8)	1.61 (1.05, 2.48)	1.52 (0.95, 2.49)	15 (21.7)	0.78 (0.49,1.23)	0.83 (0.50, 1.38)	0.023 (0.087)
Visited Healthcare Provider in Past 6 Months										

	Total Sample (N=1169)			Among Those without Depressive Symptoms at Baseline (N=740)			Among Those with Depressive Symptoms[a] at Baseline (N=429)			
Outcome	**N (%) with Outcome**	**Unadjusted RR (95% CI)**	**Adjusted RR (95% CI)**	**N (%) with Outcome**	**Unadjusted RR (95% CI)**	**Adjusted RR (95% CI)**	**N (%) with Outcome**	**Unadjusted RR (95% CI)**	**Adjusted RR (95% CI)**	**P-value* (Adjusted)**
No Recent Incarceration	618 (61.6)	Referent	Referent	314 (60.3)	Referent	Referent	235 (65.3)	Referent	Referent	
Recent Incarceration	105 (63.6)	1.04 (0.91, 1.18)	1.11 (0.98, 1.26)	49 (69.0)	1.10 (0.94, 1.29)	1.22 (1.06, 1.40)	41 (59.4)	0.97 (0.80, 1.18)	0.99 (0.80, 1.22)	0.327 (0.099)
Visited Emergency Room in Past 6 Months										
No Recent Incarceration	160 (15.9)	Referent	Referent	82 (15.7)	Referent	Referent	62 (17.2)	Referent	Referent	
Recent Incarceration	49 (29.7)	1.88 (1.04, 3.40)	1.94 (1.10, 3.41)	23 (32.4)	1.90 (0.97, 3.70)	1.98 (1.05, 3.74)	17 (24.6)	1.86 (0.99, 3.47)	1.88 (1.01, 3.52)	0.932 (0.863)

*P-values from Chi-square test of independence measuring interaction between incarceration and depressive symptoms

[a]Depressive symptoms measured at baseline with CES score ≥16

[b]Medical network : if a participant has selected 0 for the question “Is there anybody who would go to a medical appointment with you?”, then participant has no medical network