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Sexual identity, Sexual Behavior and Pre-Exposure Prophylaxis in Black Cisgender Sexual Minority Men: The N2 Cohort Study in Chicago

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Abstract

This study investigated sexual identity and behavior and their potential associations with PrEP use and attitudes in cisgender Black gay and bisexual men. A total of *N*=173 (mean age 25.2) participants from the Neighborhoods and Networks (N2) Study in Chicago were included. Of these, 104 were gay-identified and reported sex with men only (GSMO), 26 were gay-identified and reported sex with men and women (GSMW), 8 were bisexual-identified and reported sex with men only (BSMO), and 35 were bisexual-identified and reported sex with men and women

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Authors' contributions

LT and DTD conceived the study. All authors contributed to the study conception and design. Analyses were performed by LT and LT interpreted the results. The first draft of the manuscript was written by LT and all authors commented on previous versions of the manuscript critically revised the manuscript for substantial intellectual content. All authors read and approved the final manuscript.

Conflicts of interest

The authors have no conflicts of interest to declare

Ethics approval

Approval was obtained from the ethics committees of Columbia University IRB. The procedures used in this study adhere to the tenets of the Declaration of Helsinki.

Consent to participate

Informed consent was obtained from all individual participants in the study.

Consent for publication

Not applicable

Availability of data and material

Not applicable

Code availability

Available upon request

(BSMW). Reporting sex with men and women in the past six months, RR = .39, 95% CI [.17, .89], identifying as bisexual, RR = .52, 95% CI [.29, .92], and the combination of the two, RR = .24, 95% CI [.07, .76] were significantly associated with lower rates of current oral PrEP use. Black bisexual-identifying men who reported sex with men and women were significantly more likely to have discontinued oral PrEP, RR = 2.50, 95% CI [1.14, 5.50], than Black gay-identified men who reported sex with men only. Participants who had not used oral PrEP before reported lower levels of interest in long-acting injectable PrEP than those who were currently using oral PrEP, RR = .56, 95% CI [.40, .79]. No other significant differences were found. Overlooking the combination of sexual identity and behavior may mischaracterize PrEP rates and miss uniquely vulnerable subgroups. Black gay and bisexual men who had not used oral PrEP may be particularly disinterested in long-acting injectable PrEP.

Keywords

sexual identity; sexual minority men; men who have sex with men; Pre-Exposure Prophylaxis; long-acting injectable PrEP

INTRODUCTION

Sexual minority men (SMM) (1) have high rates of HIV acquisition, and rates in Black SMM are even higher, especially in urban areas. In 2018, over two thirds of new HIV diagnoses in the United States (U.S.) were among SMM, including a quarter among Black SMM, higher than any other racial group (2). This disparity is particularly striking given that Black SMM may make up as few as .3% of the U.S. adult general population (3) and research suggests that this cannot be attributed to higher levels of HIV "risk" (4). If current rates persist, 1 out of every 2 Black SMM are expected to be diagnosed with HIV in their lifetime (5).

The disproportionate burden of HIV infection among Black SMM indicates a critical need for innovative and targeted approaches to the delivery of HIV prevention modalities such as pre-exposure prophylaxis (PrEP). PrEP has been approved by the U.S. Food and Drug Administration for daily oral administration in the forms of emtricitabine/tenofovir disoproxil fumarate and emtricitabine/tenofovir alafenamide as of 2012 and 2019 respectively and is one of the most effective means of preventing HIV. Correctly administered daily oral PrEP demonstrates 99% efficacy and emergent population-level data suggest that focused, high-coverage PrEP in populations heavily impacted by HIV, including Black SMM, can rapidly reduce new HIV acquisition rates (6–12). While PrEP awareness and utilization has been increasing in the U.S. since its initial approval and the release of national guidelines in 2014 (13–15), concerns remain about its uptake among populations at risk, including Black SMM (16–18).

Just as efforts aimed at improving PrEP uptake among SMM that have treated this group as homogenous, despite their racial and ethnic diversity, have had limited effects on narrowing disparities in HIV incidence (2), efforts that ignore the sexual diversity of Black SMM may face similar obstacles to implementation and uptake. Black SMM use a variety of terms to identify their sexual orientation, ranging from more widely used terms (e.g., "gay" or

"bisexual") to those created specifically by Black SMM to denote that their experiences as distinct from those of White SMM (e.g., "same gender loving"). Further, there is gender and sex diversity in the sexual partners with which Black SMM engage, and due to complex interactions of sexuality and gender SMM may experience unique vulnerability to HIV depending on the gender/sex of their partner, owing to said partners' differing rates of HIV infection and "risk" behaviors (19).

As such, efforts to promote PrEP use that center on identification, involvement with gay-identifying communities, or sexual behavior with cisgender men exclusively may be ineffective in reaching other segments of Black SMM communities that are already underserved. While there are many common factors for sexual health between subgroups of SMM, such as condomless sex, age of sexual debut, rape/sexual assault, and numbers of sexual partners (20), the available evidence suggests that these subgroups differ from each other in several ways relevant to sexual health. For example, bisexual and gay individuals have different rates of mental health issues, substance use, sexual risk behaviors, and HIV testing (21). Bisexual men also have lower rates of sexual orientation disclosure and experience different types of stigma to gay men (21). Men who have sex with both men and women have also been found to be more likely to be living with HIV, to have never had an HIV test, to be at greater risk of being unaware of living with HIV, and less likely to have encountered HIV prevention activities or materials (20, 22). Furthermore, sexual identity and sexual behavior can interact; recent research suggests that disparities in sexually transmitted infections depend on a combination of sexual identity and sexual behavior (23). Finally, bisexual-identified men and/or men who have sex with both men and women have unique concerns that gay-identified men who have sex with men only do not, such as biphobia, pregnancy-related considerations, and their female partners' risk behaviors (20–22).

With regards to PrEP use, there are further reasons to pay special attention to sexual diversity in SMM, particularly those that are Black. Notably, men in the U.S. who have sex with both men and women are more likely to be Black. Beyond this, having sex with both men and women has been shown to be associated with higher sexual "risk" behavior (24, 25) and lower rates of PrEP awareness in Black SMM (26). Studies have found that bisexual-identified men are less likely to have used (27, 28) or even be aware of (29) PrEP than gay-identified men, though bisexuality may be associated with higher levels of PrEP use in Black SMM who are PrEP aware (26). In contrast, one study of Black SMM and trans women did not find a significant relationship between bisexual versus gay identity, but did find that PrEP use was significantly associated with higher numbers of female partners (30). Despite this research suggesting that bisexuality may be associated lower rates of PrEP use, no study to date has examined the interactive effect of sexual identity and sexual behavior on PrEP use in Black SMM. As such, it is unclear the degree to which different combinations of these distinct, but related constructs are individually associated with PrEP use. This distinction is crucial. It not only affects how bisexuality is accounted for within HIV prevention programs, but it has very different implications for what other groups are at risk. If bisexual-identified men who only have sex with men have low rates of PrEP use, then this gives us more information about which specific SMM are at risk and need targeted interventions. On the other hand, if this is the case for bisexual-identified men who have sex with men and women, this tells us that they need targeted interventions and further

gives information on a specific group of women who may be at risk: their female sexual partners. Indeed, research has suggested that as many as 13% of HIV transmissions occur from men who have sex with men and women to women (31), though this idea is often given unwarranted focus over the health and well-being of bisexual men themselves and can be a manifestation of biphobia, particularly regarding Black men (20).

Crucially, Black SMM living without HIV are less likely to than SMM of other races to be on PrEP (32, 33) and more likely to discontinue PrEP than White SMM (34–37). For example a study of SMM in San Francisco found that PrEP discontinuation is close two twice as likely for Black SMM than White SMM (adjust hazard ratio = 1.87; 95% CI [1.27, 2.74]) (37). This is despite the fact that interest in PrEP does not appear to differ along racial lines in SMM (38) and likely due to the intersectional impacts of stigma on this multiply marginalized group (39). Focused, equitable expansion of PrEP use including to Black SMM is necessary for reducing new HIV infections in the U.S. by 90% by 2030 to meet the goals of the Ending the HIV Epidemic initiative (40).

In addition to PrEP being extremely effective when taken orally, findings from HPTN 083, a recent randomized, controlled, double-blind trial, suggest that long-acting injectable cabotegravir may be even more effective than oral PrEP (41). In this trial, 1.21% of participants treated with daily oral tenofovir/emtricitabine acquired HIV, which was the case for only .38% of participants treated with injectable cabotegravir every two months (41). This is potentially due to the more frequent and less discrete nature of oral PrEP (41), though given how highly effective both are, mode of administration may be best determined on an individual basis. Since the release of HPTN 083's results, once-monthly injectable cabotegravir was granted a Breakthrough Therapy Designation by the U.S. Food and Drug Administration.

Exploring whether sexual identity and behavior are associated with oral PrEP use, oral PrEP discontinuation, and interest in long-acting injectables could inform efforts to improve PrEP uptake among Black SMM, particularly as the landscape of PrEP implementation and availability is changing and improving. In addition, it would be helpful to know whether previous experience with PrEP affects interest in long-acting injectables. Such information would help inform the development of PrEP promotion campaigns, inform clinical recommendations, and potentially explain disparities in uptake. Thus, the present study examines the combined effects of sexual behavior and sexual identity on oral PrEP use and interest in long-acting injectable PrEP, as well as the effects of never having used oral PrEP and having discontinued PrEP in a sample of cisgender Black SMM in Chicago, Illinois. We hypothesized that identifying as bisexual, having sex with men and women, and the combination of the two would each be associated with lower rates of PrEP use and higher levels of PrEP discontinuation relative to identifying as gay, having sex with only men, and the combination of these two respectively. This is in line with the above outlined research in which either sexual identity or sexual behavior were studied alone, despite empirical evidence that these constructs have unique and interlinked connections to health outcomes (42). Regarding acceptability of injectable PrEP, we did not specific a priori hypotheses due to a lack of previous literature on this newly-proven-effective mode of PrEP administration (41).

METHODS

Data collection

Approval was obtained from the ethics committees of [anonymized]. The procedures used in this study adhere to the tenets of the Declaration of Helsinki.

Data for this study came from the Neighborhoods and Networks (N2) Study. The inclusion criteria and protocols for this cohort study have been described in detail elsewhere (43). In brief, N2 is an ongoing study of Black cisgender SMM and Black transgender women in four U.S. cities: Chicago, IL, Jackson, MS and New Orleans and Baton Rouge, LA. Analyses in this study were completed using data from participants from the baseline wave of the Chicago site, which were collected between January 19th 2018 and December 11th 2019 (N=412).

In order to take part in the Chicago branch of N2, at the time of recruitment participants needed to be aged 16–34, have been assigned male at birth, identify as Black or African American, have had at least one sexual encounter with a man or a transgender woman in the past year, and reside in the Chicago, IL metropolitan statistical area, without plans to move from out of the area during the course of the study. Participants were recruited from a cluster of cohort, intervention, and service projects, as well as through snowball sampling. Participants received $150 cash incentive for attending both visits and $20 per referred participant up to a maximum of six referrals.

Participants were selected for inclusion in this study's analyses based on their current sexual identity (gay or bisexual), self-reported negative result of most recent HIV test, male gender identity, and having had sex with at least one cisgender man in the past six months. Thus, participants who identified as another sexual identity, reported a positive HIV test, identified as a gender other than male, or had not had sex with a cisgender man in the past six months were excluded from these analyses. Data were not available on participants' other sexual partners from the past six months. Participants with other sexual orientation identities and sexual behavior patterns were not included due to their extremely low numbers when combined, e.g. only two bisexual-identifying men had had sex with women only in the past six months.

Measures

Oral PrEP uptake and discontinuation.—PrEP use was measured by two questions. Participants indicated whether they were currently taking PrEP and whether they ever had by responding "Yes" or "No" to the questions "Are you currently taking PrEP to prevent HIV?" and "Have you ever taken medicines to prevent HIV infection or PrEP?". Participants were coded as currently taking PrEP if they answered "Yes" to the first question, as never having taken PrEP if they answered "No" to both questions and as having discontinued PrEP use if they answered "No" to the former question and "Yes" to the latter question. At the time of data collection, only oral PrEP to prevent HIV was available in the U.S.

Acceptability of Long-acting Injectable PrEP.—Interest in long-acting injectable PrEP was measured using three items. "How likely is it that you would consider long-acting

injectable PrEP (1 injection every one to three months) if it was $75 a month?", "How likely is it that you would consider long-acting injectable PrEP (1 injection every one to three months) if it was free?" and "How likely is it that you would consider taking long-acting injectable PrEP (1 injection every one to three months) if it had mild side effects for the first 1–2 weeks only such as nausea, cramping and vomiting?" Items were rated on a five-point scaling, ranging from 1 = "very likely" to 5 = "very unlikely". Initial examination suggested these were highly correlated (mean $r = .70$) and would create a scale with good internal reliability if collapsed (Cronbach's $\alpha = .86$). Thus, these items were averaged, creating a single Acceptability of Long-acting Injectable PrEP scale. This variable was non-normally distributed and so was dichotomized for analysis with a midpoint of 2.5, resulting in a 49.7% / 50.3% lower interest/higher interest split.

Sexual Identity.—Sexual identity was measured using a single item. Participants were asked "Do you think of yourself as:" and given response options of "Lesbian, gay, or homosexual," "Straight or heterosexual," "Bisexual," "Something else, please describe:" (with a free text box), and "Don't know."

Sexual Behavior.—Sexual behavior in the past six months was measured using a series of questions. Participants were first asked "Have you ever had oral, anal or vaginal sex with…" and the following response options were read out "A transgender woman, that is somebody assigned male at birth who identifies as female?", "A man - assigned male at birth, identifies as male?", and "A woman - assigned female at birth, identifies as female?". Participants who responded yes to any of the above were then asked if this had occurred in the last six months and how many people in each category this had occurred with. Participants were coded as having sex with men if they reported having had sex with at least one cisgender man in the past six months and having had sex with women and men if they reported having had sex with at least one cisgender man and at least one woman (transgender or cisgender) in the past six months. Participants were not asked about partners of other genders or sexes.

Covariates.—Several covariates were included based on their theoretical link to both PrEP use (44) and sexual orientation (45–47). Specifically, we included age in years and several economic indicators, which are likely associated with bisexuality due to the unique stigma experienced by bisexual men (45, 48, 49). These consisted of approximate income (binary coded as ≥ $20,000 USD vs. < $20,000 USD), education (binary coded as high school or higher vs. no high school and nothing higher), employment (binary coded as employed vs. unemployed, and housing stability. In line with previous work with this (44) cohort, housing stability was binary coded based on the combination of two items. Participants were considered stably housed if they reported both (1) having lived in stable housing that they own, rent, or stay in as part of a household in the past 6 months and (2) having moved less than 2 times in the past 6 months.

Analysis Plan

One participant had missing data on income, and six participants had missing data for housing stability and acceptability of long-acting injectable PrEP. The latter missing items were due to not taking part in the second half of the baseline survey, which is conducted

two weeks after the first (43). Missing data for housing stability and income were accounted for using single imputation with age, employment, education as predictors and missing data for acceptability of long-acting injectable PrEP items was handled using deletion. Due to the lower levels of missing data, our choice of method is not expected to drastically affect the outcome of our tests (50).

First, associations with sexual behavior (sex with men only vs. sex with men and women) and identity (gay vs. bisexual) were tested as independent variables in separate models. These consisted of modified Poisson regressions with current PrEP use as the dependent variable, modified Poisson regressions with PrEP discontinuation (compared with current PrEP use) as the dependent variable, and modified Poisson regressions with acceptability of injectable PrEP as the dependent variable. Modified Poisson regressions were chosen as this technique robustly estimates relative risk (RR) rather than the odds ratio. The latter is often misinterpreted, resulting in overstatement of research findings, particularly when the probability of the outcome is not rare (51). All models adjusted for age, employment status, annual income (≥ $20,000 USD), education (high school or higher), and housing stability. Additionally, the regressions with acceptability of injectable PrEP as the dependent variable also tested for associations with current and previous PrEP use. To test the combined effects of identity and sexual behavior, four sexual subgroups were constructed based on combinations of identity and behavior and the above three types of models were run with sexual subgroup an independent variable. Gay-identified men who had sex with men only were used on the reference group. This allowed use to test differences between this group, usually the assumed default in HIV research, and our other sexual subgroups. Sensitivity analyses were run in which participants' sexual behavior was categorized based on sex with cisgender partners only to test for differential impact of including trans women partners.

RESULTS

A total of 259 participants self-reported a negative HIV test. Of these, 42 were not included as they were transgender women, 32 were not included as they had not had sex with a man in the past six months, and a remaining 11 were not included as they identified as straight or another sexual orientation other than gay or bisexual. A single participant had missing data for sexual orientation and was also not included. The final sample consisted of N=173 cisgender Black gay and bisexual men living without HIV. Overall, 32.4% of participants were using daily oral PrEP, 13.9% had previously used oral PrEP and 53.8% had never used PrEP. Participants scored M = 2.66 (SD = 1.27) on the Acceptability of Long-acting Injectable PrEP scale, indicating a central tendency between "neither likely nor unlikely" and "likely". In total, 104 participants identified as gay and had had sex with men only in the past 6 months, 26 participants identified as bisexual and had had sex with men only in the past 6 months, 8 participants identified as gay and had had sex with both men and women in the past 6 months, and 35 participants identified as bisexual and had had sex with men and women in the past 6 months. The sample had a mean age of 25.2 (SD = 3.9). A total of 88.4% of participants had completed high school or higher education, 58.4% were currently employed, 37.2% earned $20,000 or more a year, and 63.3% were stably housed. Further details are outlined in Table I.

In the sexual behavior only models, having had sex with both men and women in the past six months was significantly associated with not using oral PrEP relative to having had sex with men only, RR = .39, 95% CI [.17, .89] , p = .025, and no other significant associations with sexual behavior were found. Similarly, in the sexual orientation identity models, bisexual identity was associated with not using oral PrEP relative to gay identity, RR = .52, 95% CI [.29, .92], p = .026, and no other significant associations with identity were found. In the final models in which sexual orientation and sexual behavior were combined, bisexual identity and having had sex with both men and women in the past six months were significantly associated with not using oral PrEP relative to identifying as gay and having had sex with men only, RR = .24, 95% CI [.07, .76], p = .015. Similarly, bisexual identity and having had sex with both men and women in the past six months were significantly associated with having discontinued using oral PrEP relative to identifying as gay and having had sex with men only, RR = 2.50, 95% CI [1.14, 5.50], p = .022. Lower levels of interest in PrEP were significantly associated with never having used oral PrEP before, RR = .56, 95% CI [.40, .79], p = .001. No other significant differences were found between sexual subgroups or previously having used and discontinued PrEP. The models are presented in Table II.

DISCUSSION

This study adds to our knowledge by identifying a Black SMM subpopulation that is less likely to be currently using PrEP and more likely to discontinue PrEP use. Black SMM who identify as bisexual and who recently had sex with both men and women had the lowest proportion of current PrEP use and the highest proportion of PrEP discontinuation, suggesting that these men might be at increased risk of acquiring HIV and onward transmission. This is a concern for the health of Black SMM themselves as well as their sexual partners, suggesting a need for targeted treatment as prevention interventions to increase PrEP use in this group. Also, no significant differences were found between subgroups in attitudes towards long-acting injectable PrEP.

These results corroborate previous research which found that bisexual-identified men are less likely to have used PrEP than gay-identified men (27, 28). The findings build upon this work by suggesting that this is true for Black bisexual-identified men, but that said results are not a product of sexual identity alone, particularly with regards to PrEP discontinuation, for which significant results were only found when subgroups were created by combining both sexual orientation identity and behavior. While not available in the present dataset for analysis, variables from the minority stress model (52) of sexual minority health may be of key explanatory importance here. These include prejudice events, disclosure of sexual minority status, expectations of rejection and self-directed stigma, all of which have been found to be associated with HIV related outcomes, albeit inconsistently (53). Notably bisexual men experience unique kinds of prejudice events that gay men do not, have unique difficulty connecting with the sexual minority community relative to gay men, and are substantially less likely to disclose their sexual minority status than gay men (21). Regarding disclosure, Black (and potentially other races of) bisexual men who have sex with men and women may be less likely to disclose to their sexual orientation to their clinicians than other sexual subgroups, thus having less of an opportunity to be prescribed PrEP.

Though little research has examined whether differences between Black sexual minority subgroups are identity- or behavior-based, one particularly pertinent study on Black SMM found that both gay- and bisexual-identified participants who have sex with both men and women reported higher rates of physical assault, sexual minority concealment, and lack of community support than gay-identified participants who have sex with men only (54). Notably, these apparently behavior driven community differences may explain the present findings. If the bisexual-identified participants in our study who have sex with both men and women are less connected to the sexual minority community, they may also have less exposure to community messaging and norms around the effectiveness and importance of PrEP. Indeed, research has found that Black men who have sex with men and women receiving support from the gay community are more likely to be PrEP aware and if PrEP aware this group is more likely to be using PrEP than Black men who have sex with men only (26). Additionally, if they do not see themselves represented in that messaging, it may not seem as relevant to their needs. Policy makers might consider broad messaging campaigns with dissemination in spaces beyond those frequented by sexual minority communities in order to reach vulnerable groups that are disconnected from said communities.

On the other hand, these results could be seen to conflict with other work which found that using PrEP is not associated with bisexual versus gay identity and that it is significantly associated with higher numbers of female partners in Black SMM (30). This may be a result of the fact that conflicting work looked specifically at number of female partners instead of presence or absence of sex with women. Having sex with higher numbers of women may be associated with higher rates of PrEP use due to individuals attempting to protect themselves from increased vulnerability from having multiple sex partners, but equally having sex with a low number of women may be associated with lower PrEP use than no sex with women due to the above-outlined social reasons. This suggests that the relationship between number of female sex partners and PrEP use in Black SMM may be bimodal in distribution. We suggest future researchers examine this using appropriate non-linear methods of analysis.

In contrast, we did not find significant differences between sexual subgroups regarding acceptability of long-acting injectable PrEP, a mode of administration showing great promise as an alternative to daily oral PrEP (41). While non-significant effects should not be taken as evidence of a null effect, one potential explanation for the lack of significant differences between groups is that long-acting injectable PrEP may have broader appeal across sexual subgroups of Black SMM, potentially due to its infrequent administration and therefore ease of concealment. That said, we also found that never having previously used oral PrEP was associated with lower acceptability of long-acting injectable PrEP. While we do not know why these specific individuals have never used oral PrEP, these results would seem to indicate that injectable PrEP would not fully address the concerns or potential issues these participants had regarding oral PrEP, but that it may have appeal to individuals who had discontinued oral PrEP.

Regardless, our findings underline the need to address PrEP uptake across sexual subgroups of Black SMM rather than treating these groups as homogenous. This may be crucial as injectable cabotegravir becomes more widely available in the coming months and years,

and the potential benefits of communicating the multiple modes of administration of PrEP available should be examined. PrEP promotion strategies could also be targeted based on sexual behavior and sexual identity and the effects of such targeted campaigns should be assessed.

Limitations

The results of this study need to be considered in the context of a few methodological limitations. Firstly, the available data set did not include relevant minority stress variables, such as outness and community connectedness, which could have further informed theoretical explanation and strategies for targeting intervention, and there may have been residual confounding. Furthermore, the test variables were self-reported and based on the past six months. If participants' identities, sexual behavior and PrEP use were influenced by stigma, their reporting of these may have been influenced too, and recall bias may be a concern. Additionally, there may be different effects depending on whether participants have previously had sex with both men and women or previously identified as gay or bisexual. Future research should examine PrEP biomarkers in addition to self-reported PrEP use and sexual attraction, identity, and behavior across life. Another limitation is the lack of information on the reason for PrEP discontinuation amongst participants. Some participants may have ceased PrEP because they were no longer having sex or had newly entered a monogamous relationship with a partner living without HIV, thus no longer being high risk for HIV. Future studies should differentiate the circumstances under which individuals of different sexual orientations and behaviors discontinue PrEP. An additional issue is the sample size. This prevented us from performing more complex analyses, such as interactions between identity, attraction, and behavior, made for wide confidence intervals and may limit the reliability of our results. Finally, due to the non-probability sampling methods and the specific focus on Chicago, it is unclear the extent to which these results generalize to the larger Black SMM population, though notably the use of snowball sampling helped us reach members of this Black SMM who would not have been be found using typical methods associated with sexual minority health research.(55)

Conclusion

Black bisexual-identified men who have sex with men and women were less likely to be using oral PrEP and more likely to have discontinued previous use. Overlooking the combination of sexual identity and behavior may mischaracterize PrEP rates in Black SMM and miss uniquely vulnerable subgroups. Black gay and bisexual men who had not used oral PrEP may be particularly disinterested in long-acting injectable PrEP. These results can be used to inform interventions aimed to help reach all vulnerable populations.

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Table I

Descriptive Statistics for Study Sample of Black Cisgender Sexual Minority Men, The N2 Cohort Study in Chicago (n = 173)

	Gay		Bisexual			
	SMO	**SMW**	**SMO**	**SMW**	**χ^2**	***p***
Total *n*	104	8	26	35		
Currently using PrEP - %	40.4	37.5	30.8	8.6	14.4	.025
Discontinued PrEP - %	14.4	12.5	15.4	11.4		
Never used PrEP - %	45.2	50.0	53.9	80.0		
Higher Interest in LAI PrEP - %	52.0	62.5	50.0	39.4	2.14	.545
Lower Interest in LAI PrEP - %	48.0	37.5	50.0	60.6		
Education - % high school or higher	92.3	87.5	88.5	77.1	5.9	.117
Employed - %	67.1	75.0	46.2	37.1	12.4	.006
Annual income - % ≥ $20,000 USD	51.1	62.5	66.7	40.0	1.0	.791
Stable Housing - %	71.2	50.0	61.5	37.1	12.5	.006
					F	**p**
Age - Mean	25.1	24.0	25.6	25.5	.41	.745

SMO = Had sex with at least one man and no women in the past 6 months

SMW = Had sex with at least one woman and at least one man in the past 6 months

Table II

Associations with Oral Pre-Exposure Prophylaxis Use and Discontinuation, and Interest in Long-Acting Injectable PrEP in Black Cisgender Sexual Minority Men

	Currently using oral PrEP		Discontinued oral PrEP		Acceptability of injectable PrEP	
	RR [95% CI]	***p***	**RR [95% CI]**	***p***	**RR [95% CI]**	***p***
Sexual behavior						
SMO	1.00 [1.00, 1.00]		1.00 [1.00, 1.00]		1.00 [1.00, 1.00]	
SMW	**.39 [.17, .89]**	**.025**	1.82 [.90, 3.67]	.095	1.02 [.68, 1.55]	.911
PrEP						
Currently using					1.00 [1.00, 1.00]	
Discontinued use					.76 [.48, 1.20]	.238
Never used					**.56 [.40, .79]**	**.001**

	Currently using oral PrEP		Discontinued oral PrEP		Acceptability of injectable PrEP	
	RR [95% CI]		**RR [95% CI]**		**RR [95% CI]**	
Sexual Orientation Identity						
Gay-identified	1.00 [1.00, 1.00]		1.00 [1.00, 1.00]		1.00 [1.00, 1.00]	
Bisexual-identified	**.52 [.29, .92]**	**.026**	1.77 [.75, 4.15]	.192	1.01 [.70, 1.47]	.956
PrEP						
Currently using					1.00 [1.00, 1.00]	
Discontinued use					.76 [.48, 1.20]	.237
Never used					**.56 [.40, .79]**	**.001**

	Currently using oral PrEP		Discontinued oral PrEP		Acceptability of injectable PrEP	
	RR [95% CI]		**RR [95% CI]**		**RR [95% CI]**	
Sexual subgroup						
Gay-identified, SMO	1.00 [1.00, 1.00]		1.00 [1.00, 1.00]		1.00 [1.00, 1.00]	
Bisexual-identified SMO	.85 [.44, 1.65]	.632	1.32 [.42, 4.18]	.635	1.06 [.68, 1.66]	.781
Gay-identified, SMW	.89 [.36, 2.18]	.792	1.08 [.15, 7.56]	.937	1.20 [.60, 2.41]	.613
Bisexual-identified, SMW	**.24 [.07, .76]**	**.015**	**2.50 [1.14, 5.50]**	**.022**	.98 [.59, 1.62]	.939
PrEP						
Currently using					1.00 [1.00, 1.00]	
Discontinued use					.77 [.49, 1.20]	.246
Never used					**.56 [.40, .79]**	**.001**

RR = Relative Risk

PrEP = Pre-Exposure Prophylaxis

SMO = has had sex with men only in the past six months

SMW = has had sex with men and women in the past six months

All models adjusted for age, employment status, annual income (≥ $20,000 USD), Education (Highschool or higher), and Housing Stability.

Significant effects are bolded.