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Changes in HIV Pre-exposure Prophylaxis Awareness and Use Among Males Who Inject Drugs Who Have Sex with Men by Sexual Identity, 19 US Urban Areas, 2018 & 2022

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Abstract

Background: Males who inject drugs who have sex with men (MWIDSM) may acquire HIV through injecting drugs or sex. Interventions to increase awareness of HIV pre-exposure prophylaxis (PrEP) have focused on gay/bisexual men who have sex with men (MSM) and may not be reaching heterosexual-identifying men or people who inject drugs (PWID). We explored changes in PrEP awareness and use among MWIDSM from 2018 to 2022 by sexual identity.

Methods: We used data from the 2018 and 2022 National HIV Behavioral Surveillance among PWID recruited via respondent-driven sampling in 19 urban areas in the US. We examined changes in PrEP awareness and use over time by sexual identity among HIV-negative males who inject drugs and who had sex with another man in the past 12 months using log-linked Poisson regression models with robust standard errors with an interaction term between year and sexual identity.

Results: Among 758 HIV-negative MWIDSM (463 in 2018; 295 in 2022), nearly all sample participants were likely indicated for PrEP (94.2% and 92.9%, respectively). PrEP awareness increased from 2018 to 2022 among gay/bisexual-identifying MWIDSM (45.5% to 65.5%; aPR=1.49, 95%CI=1.30-1.70) but remained stable for heterosexual-identifying MWIDSM (39.4% to 40.8%; aPR=1.01, 95%CI 0.75-1.36). PrEP use remained low among all MWIDSM (2.5% to 7.7%, among heterosexually-identifying; 15.3% to 10.2% among gay/bisexual-identifying).

Conclusions: PrEP awareness increased among gay/bisexual-identifying MWIDSM but not among heterosexual-identifying. PrEP use was low for all MWIDSM. Public health initiatives

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catered to MWIDSM should focus on improved campaigns and expanding PrEP accessibility in existing healthcare, harm reduction, and social services.

Keywords

persons who inject drugs; men who have sex with men; HIV; PrEP; PrEP awareness; PrEP use; harm reduction

INTRODUCTION

HIV pre-exposure prophylaxis (PrEP) substantially reduces the risk of getting HIV from sex and from injection drug use [1]. The Centers for Disease Control and Prevention (CDC) recommends PrEP for adults or adolescents who are sexually active or who inject drugs with substantial risk* of acquiring HIV [1]. Although PrEP is a key prevention component in the U.S. Ending the HIV Epidemic (EHE) initiative, only around a third of people indicated were prescribed PrEP in 2023, falling short of EHE's target of 50% by 2025 [2].

Many males who inject drugs who have sex with men (MWIDSM) engage in both injecting and sexual behaviors that increase their chances of acquiring HIV. PrEP may be a useful HIV prevention option for MWIDSM since it is personally controlled, unlike condoms and sterile injection practices that may be subject to negotiation with sexual and/or injecting partners [3]. However, information on the prevalence of PrEP awareness and use among MWIDSM remains limited. CDC's National HIV Behavioral Surveillance (NHBS) has reported that 90.4% of HIV-negative MSM in 2017 and 35.2% of HIV-negative people who inject drugs (PWID) in 2022 were aware of PrEP, whereas 35.1% and 1.2%, respectively, reported PrEP use in the past 12 months [4, 5]. Further, increases in PrEP awareness and use were noted between 2014 and 2017 among MSM [4], however, it is unknown whether similar changes were observed for MWIDSM. Interventions to increase PrEP awareness have focused messages to reach gay/bisexual MSM [6] and may not be reaching MWIDSM, particularly those who are heterosexually-identifying [6, 7].

We examined changes in PrEP awareness and use among MWIDSM in 2018 and 2022, by sexual identity. Findings can inform PrEP outreach and implementation programs tailored to MWIDSM.

METHODS

We analyzed data from the 2018 and 2022 NHBS among PWID recruited via respondent-driven sampling (RDS) in 19 urban areas in the U.S.† Briefly, initial recruits (seeds)

*CDC defines an individual with substantial risk of acquiring HIV infection as follows: (1) person who injects drugs who shares injection equipment or has an injecting partner with HIV infection; (2) person who had anal or vaginal sex in the past 6 months and (a) a sexual partner with HIV, particularly if viral load is detectable or unknown, or (b) diagnosed with a bacterial sexually transmitted infection in the past 6 months, or (c) who has history of inconsistent or no condom use.

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were identified through outreach or from referrals from persons who are knowledgeable about the local PWID populations [5, 8]. Seeds who were determined to be eligible and who completed an interviewer-administered standardized survey were provided coupons to recruit up to 5 people they know who inject drugs (recruits) [5, 8]. Those recruits who were eligible and who completed the survey were then asked to recruit a up to 5 other recruits. This process continued until either the target sample size of 500 per urban area was reached or the recruitment period ended, whichever came first (median recruitment wave: 5) [5, 8]. RDS diagnostics were conducted to assess reciprocity, homophily, and convergence (based on age, race, and self-reported HIV status), to check for assumptions on RDS and to inform recruitment operations. More information on the methodology, e.g., eligibility and data collection procedures, are reported elsewhere [5, 8]. We included HIV-negative males [‡] who inject drugs and who had at least one male sex partner in the past 12 months (MWIDSM), and who reported their sexual identity.

Outcomes were PrEP awareness (ever heard of PrEP: yes/no) and PrEP use in the past 12 months (taken PrEP to reduce the risk of getting HIV: yes/no). The moderator was sexual identity (heterosexual or gay/bisexual).

We compared the sociodemographic and behavioral variables in 2018 and 2022. We created the variable to reflect being likely indicated for PrEP using criteria that closely align with the CDC clinical guidelines for PrEP use. A participant was considered likely indicated for PrEP if they reported (1) having anal/vaginal sex in the past 12 months and any of the following in the past 12 months (a) condomless anal/vaginal sex, or (b) diagnosed with bacterial sexually transmitted disease (STD), or (c) last sex partner was HIV-positive; or (2) shared syringes or equipment.

Log-linked Poisson regression models with robust standard errors were used to obtain adjusted prevalence ratios (aPRs) and 95% confidence intervals (CIs) to assess changes in PrEP awareness and use from 2018 to 2022. Potential confounding variables were identified based on the literature and were included in parsimonious models adjusted for age, race/ethnicity, city, and network size, and accounted for clustering by recruitment chain [3, 9]. Models included the year of survey, sexual identity, and an interaction term between year and sexual identity to test for interaction on the multiplicative scale. Since the interaction term was significant (p-interaction=0.02), aPRs stratified by sexual identity were calculated. Weighted analysis was not performed as unweighted regression modeling is recommended when using data from RDS samples [10]. Statistical analyses were performed in SAS (version 9.4; SAS Institute, Cary, North Carolina).

RESULTS

Among 758 HIV-negative MWIDSM (463 in 2018; 295 in 2022), 331 (71.5%) in 2018 and 197 in 2022 (66.8%) identified as gay/bisexual (Table 1). A greater percentage of the sample in 2022 was 40 and older (60% vs 51.2% in 2018) and had health insurance (81.4% vs

[‡]HIV-negative males include those who did not report a previous HIV-positive test and tested HIV-negative in NHBS. A sensitivity analysis including those who did not report a previous HIV-positive test and tested HIV-positive to the analytical sample did not generate meaningfully different estimates.

67.0% in 2018). Overall, 29.8% were Black and 24.9% were Hispanic, 73.2% were at or below the federal poverty level, and 82.8% reported homelessness in the past 12 months. Nearly all sample participants (94.2% in 2018; 92.9% in 2022) were likely indicated for PrEP.

Comparing 2022 with 2018, there was a significant increase in PrEP awareness among gay/bisexual-identifying MWIDSM (64.5% from 45.5%; aPR=1.49, 95%CI=1.30-1.70), but not among heterosexual-identifying MWIDSM (40.8% from 39.4%; aPR=1.01, 95%CI=0.75-1.36) (Table 2). PrEP use was low in both 2018 and 2022 among all MWIDSM who were aware of PrEP (7.7% and 2.5%, respectively, among heterosexually-identifying; 15.3% and 10.2% among gay/bisexual-identifying).

DISCUSSION

PrEP awareness among MWIDSM is low, however, from 2018 to 2022, this increased but only among those gay/bisexual-identifying MWIDSM. This could suggest that HIV-related information may transfer readily to MWIDSM in extensive networks of gay/bisexual men, and less efficiently among heterosexual-identifying MWIDSM [3]. PrEP messaging for PWID in general is lacking [6]; further, PrEP campaigns have focused among gay/bisexual men and may have not considered the perspectives and values of heterosexual-identifying MSM [3, 7]. Additionally, our analytical sample is comprised of MSM among PWID networks, who are less likely to identify as gay/bisexual and are less likely to be involved in MSM-focused HIV prevention programs compared to PWID from MSM networks [11]. MWIDSM is a heterogenous population with varied networks and sexual identity [3, 7, 12], and thus, further understanding of these men and the implications for HIV prevention are warranted. Future studies might consider comparing MWIDSM with MSM who reported injecting drugs on a national scale; such analytical approach takes into consideration the differences of two groups by, for instance, network connectivity and culture [11].

While PrEP use increased among MSM in 2014-2017 [4], it remained low among MWIDSM in 2018 and 2022, irrespective of sexual identity. Although high willingness to take PrEP among PWID has been reported [13], known barriers to PrEP use include behavioral and structural factors, e.g., lack of knowledge about PrEP, adherence, healthcare apathy, discrimination, cost, and homelessness [13]. Current health and social services that serve MWIDSM, e.g., syringe service programs (SSP), substance use services, shelters, and food pantries, could deliver comprehensive HIV prevention services by providing PrEP education, navigation, and dispensing. Co-location of these services have not only been preferred by providers and PWID, but this would also lessen number of visits and consolidate services to synergistically prevent HIV transmission and improve overall health and wellness of PWID [14-16]. Primary care could likewise provide PrEP, potentially lessening the stigma associated with HIV, drug use, MSM, or PWID clinics. Given the co-occurring behavioral indications for PrEP among MWIDSM, providers should incorporate assessments of sexual and drug use into routine care [12] and offer PrEP to all MWIDSM. Lastly, long-acting injectable PrEP has been preferred by PWID due to convenience and injection familiarity; hence, efficacy and safety studies among PWID are warranted [17].

Nonetheless, social determinants of health that pervasively disadvantage MWIDSM should be further addressed.

We acknowledge some study limitations. First, given the limitations in the recruitment approach, the findings are not generalizable to other geographic areas or to all MWIDSM. The lower number of participants in 2022 may likely be explained by the general lower number of male PWID recruited in NHBS-PWID 2022 (N=7,891; 6.8% MWIDSM) than in NHBS-PWID 2018 (N=4,736; 6.7% MWIDSM). Second, self-reported data may be subjected to social desirability and recall biases. Given the dynamic nature of male-to-male sex behavior in various settings (e.g., incarceration, sex work) and the internalized stigma associated with male-to-male sex and gay/bisexual identity among PWID [11, 18, 19], we may have misclassified participants based on their self-report of sexual behavior and identity and this could have influenced our association estimates. Lastly, not all NHBS variables align with the CDC clinical guidelines for PrEP use. We used variables that closely approximated the guidelines, however our prevalence estimates for likely indicated for PrEP may be overestimated.

In summary, PrEP awareness increased among gay/bisexual-identifying MWIDSM, but not among heterosexual-identifying MWIDSM. PrEP awareness and use were low regardless of sexual identity. Given their co-occurring sexual and drug use HIV risk behaviors, involving their overlapping wider networks and partners, addressing PrEP uptake among MWIDSM has broader implications on preventing HIV among MSM and PWID populations and their partners. Initiatives catered to MWIDSM should focus on improved campaigns and expanding PrEP accessibility in existing healthcare, harm reduction, and social services.

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Data availability:

Data may be available upon request from nhbs@cdc.gov.

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Table 1.

Distribution of characteristics among males who inject drugs who have sex with men, National HIV Behavioral Surveillance among People Who Inject Drugs, 19 U.S. cities, 2018 and 2022 (N = 758)

	Males who inject drugs who have sex with men					
	Total (N = 758)		2018 (N = 463)		2022 (N = 295)	
	n[a]	% col[a]	n[a]	% col[a]	n[a]	% col[a]
Age at interview (year)						
18 - 29	134	17.7	100	21.6	34	11.5
30 - 39	210	27.7	126	27.2	84	28.5
40 - 49	192	25.3	111	24.0	81	27.5
>=50	222	29.3	126	27.2	96	32.5
Race/ethnicity [b]						
Black/African-American	226	29.8	136	29.4	90	30.5
Hispanic/Latino	189	24.9	115	24.8	74	25.1
White	271	35.8	170	36.7	101	34.2
Other	71	9.4	42	9.1	29	9.8
Sexual identity						
Heterosexual	230	30.3	132	28.5	98	33.2
Gay or bisexual	528	69.7	331	71.5	197	66.8
Poverty [c]						
Above the federal poverty level	199	26.3	120	25.9	79	26.8
At or below the federal poverty level	555	73.2	341	73.7	214	72.5
Incarceration in the past 12 months [d]						
No	449	59.2	251	54.2	198	67.1
Yes	309	40.8	212	45.8	97	32.9
Homelessness						
Not homeless in the past 12 months	131	17.3	70	15.1	61	20.7
Currently homeless	503	66.4	316	68.3	187	63.4
Homeless in the past 12 months but not currently	124	16.4	77	16.6	47	15.9
Visited a healthcare provider in the past 12 months						
No	188	24.8	105	22.7	83	28.1
Yes	570	75.2	358	77.3	212	71.9
Healthcare insurance coverage						
No	206	27.2	152	32.8	54	18.3
Yes	550	72.6	310	67.0	240	81.4
Received money/drugs for sex with a male partner in the past 12 months						
No	321	42.3	182	39.3	139	47.1
Yes	434	57.3	279	60.3	155	52.5

	Males who inject drugs who have sex with men					
	Total (N = 758)		2018 (N = 463)		2022 (N = 295)	
	n[a]	% col[a]	n[a]	% col[a]	n[a]	% col[a]
Likely indicated for PrEP						
No	48	6.3	27	5.8	21	7.1
Yes	710	93.7	436	94.2	274	92.9
Shared syringes or equipment in the past 12 months						
No	264	34.8	146	31.5	118	40
Yes	494	65.2	317	68.5	177	60
Any condomless anal/vaginal sex in the past 12 months [e]						
No	59	8.4	32	7.5	27	9.9
Yes	642	91.6	395	92.5	247	90.1
Last sex partner was HIV-positive[e,f]						
No	667	95.1	409	95.8	258	94.2
Yes	34	4.9	18	4.2	16	5.8
Bacterial sexually transmitted disease in the past 12 months [e]						
No	633	90.3	393	92	240	87.6
Yes	68	9.7	34	8	34	12.4
Drug most often injected in the past 12 months [g]						
Heroin by itself	217	28.6	166	35.9	51	17.3
Cocaine by itself	22	2.9	15	3.2	7	2.4
Speedball (heroin and cocaine together)	56	7.4	40	8.6	16	5.4
Speedball, heroin, or cocaine[h]	89	11.7	49	10.6	40	13.6
Crack by itself	3	0.4	1	0.2	2	0.7
Methamphetamine by itself	156	20.6	74	16	82	27.8
Oxycontin or painkillers by itself	7	0.9	3	0.6	4	1.4
Multiple	205	27	113	24.4	92	31.2
Obtained sterile syringes or injection equipment from syringe services programs in the past 12 months						
No	291	38.4	177	38.2	114	38.6
Yes	466	61.5	285	61.6	181	61.4
Aware of PrEP						
No	388	51.2	260	56.2	128	43.4
Yes	369	48.7	202	43.6	167	56.6
PrEP use in the past 12 months (limited to those aware of PrEP)						
No	328	88.9	175	86.6	153	91.6
Yes	41	11.1	27	13.4	14	8.4

Col – column; PrEP – pre-exposure prophylaxis.

[a]Numbers and percentages may not sum up to total due to missing values.

[b] All racial/ethnic group categories are mutually exclusive; Hispanic/Latino persons could be of any race. “Other” race/ethnicity were combined due to small sample and include American Indian/Alaskan Native, Asian, and Native Hawaiian/Pacific Islander.

[c] Income at or below the HHS poverty guidelines, defined by the US Department of Health and Human Services in 2018 (https://aspe.hhs.gov/topics/poverty-economic-mobility/poverty-guidelines/prior-hhs-poverty-guidelines-federal-register-references/2018-poverty-guidelines) and in 2022 (https://aspe.hhs.gov/sites/default/files/documents/175e430d7dd4b1622d7245bc8664b3c2/HHS-Poverty-Guidelines-Fed-Register-2022.pdf).

[d] Held in a detention center, jail, or prison for more than 24 hours.

[e] Only among those who had anal or vaginal sex in the past 12 months (n=701; n=427 in 2018; n=274 in 2022).

[f] HIV positive status of last partner was reported by the participant. “No” includes HIV negative, indeterminate, and unknown.

[g] As participants may be injecting more than one type of drugs at the same time, frequencies of injection for each drug were collected. Drugs specified in the table were determined as the drug that had highest frequency while all other drugs were injected less often. If more than one drug were reported as most frequent, and at least one of these drugs was something other than cocaine, heroin, or speedball, then it was labelled multiple.

[h] Can be any combination of responses of cocaine, heroin, and speedball, as the most frequently injected drug, given that no other drug was reported as frequent

Table 2.

Changes in PrEP awareness and PrEP use among HIV-negative males who inject drugs who have sex with men, National HIV Behavioral Surveillance among People Who Inject Drugs, 19 U.S. cities, 2018 and 2022

Sexual identity	PrEP Awareness					PrEP Use (among those aware of PrEP)				
	2018		2022		2022 vs 2018	2018		2022		2022 vs 2018
	n[a]	%[a,b]	n[a]	%[a,b]	aPR (95% CI)[c]	n[a]	%[a,b]	n[a]	%[a,b]	aPR (95% CI)[c,d]
Heterosexual	52	39.4	40	40.8	1.01 (0.75-1.36)	4	7.7	1	2.5	-
Gay or bisexual	150	45.5	127	64.5	1.49 (1.30-1.70)	23	15.3	13	10.2	-

aPR - Adjusted prevalence ratios; CI - confidence intervals; PrEP – pre-exposure prophylaxis.

[a] Numbers and percentages may not sum up to total due to missing values.

[b] Denominators are N = 132 for heterosexual, N = 331 for gay or bisexual, and N = 463 for MSM overall in 2018 (4 participants had missing sexual identity and was dropped from the analysis); N = 98 for heterosexual, N = 197 for gay or bisexual, and N = 295 for MSM overall in 2022.

[c] Models were adjusted for age, race/ethnicity, city, and network size, and accounted for clustering. A further analysis including those who did not report a previous HIV-positive test and tested HIV-positive to the analytical sample did not generate significantly different estimates.

[d] Model did not converge due to small sample size.