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Non-fatal opioid overdose and unmet need for medications for opioid use disorder among recently incarcerated people who inject drugs

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Abstract

Background: Medications for opioid use disorder (MOUD) are key to preventing opioid overdose. Despite the high risk of opioid overdose among recently incarcerated people who use drugs, missed opportunities for engagement in MOUD treatment persist in this population. We examined the association between unmet need for MOUD and non-fatal opioid overdose among recently incarcerated people who inject drugs (PWID) and assessed prevalence of non-fatal opioid overdose by selected characteristics.

Methods: We analyzed 2022 data from the National HIV Behavioral Surveillance (NHBS) system among PWID from 20 large U.S. cities. Adjusted prevalence ratios (aPR) and 95%

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Declaration of Interest Statement

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

confidence intervals (95% CI) were calculated to examine the association between unmet need for MOUD and non-fatal opioid overdose.

Results: Among 1,648 recently incarcerated PWID, 28% reported an unmet need for MOUD and 39% reported a non-fatal opioid-involved overdose in the past 12 months. Experiencing homelessness in the last 12 months (aPR=1.43, 95% CI=1.27–1.61) and living in the Midwest region of the U.S. (aPR=1.18, 95% CI=1.01–1.38) were significantly associated with reporting a non-fatal opioid overdose. Recently incarcerated PWID with an unmet need for MOUD were 1.4 times as likely to report a non-fatal opioid overdose in the past 12 months (50%; aPR=1.42, 95% CI=1.29–1.56) compared with recently incarcerated PWID without an unmet need for MOUD (35%).

Conclusions: Unmet need for MOUD was significantly associated with non-fatal opioid overdose among PWID who were incarcerated in the past 12 months, suggesting the need to investigate specific strategies to improve to MOUD treatment among recently incarcerated PWID.

Keywords

medications for opioid use disorder; non-fatal opioid-related overdose; National HIV Behavioral Surveillance; drug injection; overdose prevention

Introduction

Medications for opioid use disorder (MOUD) are the gold standard to treat opioid use disorder (OUD) and are known to reduce the risk of fatal opioid overdose (Krawczyk et al., 2020). Access to MOUD in jails and prisons in many states has increased in recent years due to legislation enactments and the implementation of policies for the provision of at least one form of MOUD treatment (buprenorphine, methadone, or naltrexone) (Weizman et al., 2021). However, access and availability to MOUD remains suboptimal due to various barriers, such as sub-population specific policies, budget constraints, and lack of licensed health care staff in correctional facilities (Flanagan Balawajder et al., 2024; Weizman et al., 2021). The overall use of buprenorphine in correctional settings increased by 224-fold between June 2016 and May 2021, but only 3.6% of the 270,000 people with OUD who were incarcerated in the United States received buprenorphine (Thakrar et al., 2021). Where MOUD is offered, protocols can vary widely across correctional facilities. For example, in some jails and prisons, MOUD is offered only to those about to be released, therefore individuals actively using opioids or taking MOUD upon incarceration had to go through involuntary withdrawal (Cates & Brown, 2023; Grella et al., 2020). Provision of adequate MOUD care to individuals while incarcerated, either to initiate or continue treatment, can reduce the risk of opioid overdose upon release and increase post-release engagement with community-based MOUD treatment (Cates & Brown, 2023).

Although MOUD treatment after incarceration can be facilitated by correctional facilities it is not always accomplished. It has been shown that the likelihood of offering any MOUD in jails significantly decreased with higher community social vulnerability (i.e., poverty level, unemployment) (Flanagan Balawajder et al., 2024). Also, having fewer accessible community facilities providing MOUD treatment is associated with limited MOUD

availability for the jail population while incarcerated and after release (Flanagan Balawajder et al., 2024). Barriers related to accessing basic needs (i.e., housing, employment) coupled with the lack of structured support (i.e., absence of transitional programs, challenges with social relationships) upon release can adversely affect continuity of MOUD treatment as survival needs might be prioritized over MOUD treatment (Hoffman et al., 2023).

The associations between recent incarceration and non-fatal opioid overdose (Hartung et al., 2023; Hoover et al., 2023; Mital et al., 2020) or MOUD treatment (Hoover et al., 2023) have been explored; however, research on unmet need for MOUD among recently incarcerated individuals remains sparse, including in large metropolitan areas (Hoover et al., 2023). Unmet need, that is trying to obtain MOUD but being unable to, represents a critical missed opportunity for engagement in care and overdose prevention. To better understand the extent of unmet need for MOUD among people who inject drugs (PWID) who have recently been incarcerated, we used data from the Centers for Disease Control and Prevention (CDC) National HIV Behavioral Surveillance (NHBS) collected from PWID in 2022 across 20 large cities in the U.S. Specifically, we evaluated the association between self-reported unmet need for MOUD and non-fatal opioid overdose in this large, geographically diverse sample of recently incarcerated PWID. We highlight opportunities for engagement in MOUD treatment among recently incarcerated PWID.

Methods

For this analysis, cross-sectional survey data were analyzed from the 2022 NHBS cycle among PWID. NHBS-PWID methodology has been described in CDC's surveillance report (Centers for Disease Control and Prevention, 2024). Eligibility criteria for participation were being 18 years or older, completing the survey in English or Spanish, and reporting injecting drugs that were not prescribed to them in the past 12 months. The analysis was restricted to participants who reported being incarcerated in the past 12 months (having been held in a detention center, jail, or prison for more than 24 hours), injecting opioids that were not prescribed to them in the past 12 months and had complete data for the dependent and independent variables.

Non-fatal opioid overdose in the past 12 months (dependent variable) was measured by asking participants if they overdosed (defined as passed out, turned blue, or stopped breathing) from using heroin or prescription pain medication (not including fentanyl or other synthetic opioids). Unmet need for MOUD (independent variable) was measured by asking all participants if they tried to get MOUD but were unable to do so in the past 12 months. We assessed for confounding with the following factors: race/ethnicity, age, sex, health insurance status, homelessness, and region of residence.

Prevalence of non-fatal opioid overdose by select characteristics is presented in Table 1. Adjusted prevalence ratios (aPRs) and 95% confidence intervals (CIs) were generated by log-linked Poisson regression models with generalized estimating equations, clustered on recruitment chains. All models were adjusted for participant network size and city. No confounding was found using the 10% change in estimate approach; thus, additional

variables were not included in the final regression model. Analyses were conducted using SAS software (version 14.1; SAS Institute).

Results

Among the 1,648 recently incarcerated PWID included in our analysis, 28% reported an unmet need for MOUD and 39% experienced a non-fatal opioid overdose in the past 12 months (Table 1). The majority of participants were Black or Hispanic/Latino (51%), male (74%), aged 30–49 years (61%), uninsured (80%), homeless in the past 12 months (81%), and lived in the West (35%) or South (35%) regions of the U.S. Among recently incarcerated PWID, experiencing homelessness in the last 12 months ($aPR=1.43$, 95% $CI=1.27–1.61$) was significantly associated with reporting a non-fatal opioid overdose. Living in the Midwest region ($aPR=1.18$, 95% $CI=1.01–1.38$) was also significantly associated with reporting a non-fatal opioid overdose when compared to living in the West region of the U.S. Non-fatal opioid overdose was not significantly associated with other demographic variables. Recently incarcerated PWID with an unmet need for MOUD were 1.4 times as likely to report a non-fatal opioid overdose in the past 12 months (50%; $aPR=1.42$, 95% $CI=1.29–1.56$) compared with recently incarcerated PWID without an unmet need for MOUD (35%).

Discussion

We demonstrated a significant association between unmet need for MOUD and non-fatal opioid overdose in the past 12 months among recently incarcerated PWID recruited across 20 geographically diverse large cities in the U.S. Moreover, the prevalence of unmet need for MOUD and non-fatal opioid overdose in the past 12 months was high in this sample, consistent with other studies (Hartung et al., 2023; Hoover et al., 2023).

Current findings underscore the ongoing unmet need for MOUD among recently incarcerated PWID, despite the evidence-based benefits of these medications to reduce overdose mortality (Krawczyk et al., 2020). Recent incarceration is highly associated with risk of overdose (Hartung et al., 2023; Hoover et al., 2023; Mital et al., 2020). Ensuring MOUD treatment for those who need it while incarcerated, access to all forms of MOUD (including extended-release buprenorphine), and providing linkage to MOUD post-incarceration (i.e., connecting people to community providers prior to their release) can facilitate improved outcomes for recently incarcerated individuals, such as decreases in relapse rates and overdose-related outcomes (Substance Abuse and Mental Health Services Administration, 2019).

In our analysis, homelessness was associated with non-fatal opioid overdose among recently incarcerated PWID. Qualitative data suggests that individuals can face substantial social barriers, such as unstable housing and unemployment, post-release from correctional facilities, undermining opportunities for access to MOUD and treatment continuity (Hoffman et al., 2023). Low-barrier, targeted, accessible interventions, involving models for case management, supportive housing initiatives (i.e., not contingent to MOUD treatment),

and mobile and street-outreach MOUD clinics, can help with continuity of MOUD treatment among people experiencing homelessness (McLaughlin et al., 2021).

Recently incarcerated PWID may benefit from efforts to reduce unmet need for MOUD. Partnering with community providers can improve access to MOUD by addressing challenges faced by recently incarcerated persons during community reentry (Substance Abuse and Mental Health Services Administration, 2019). Post-release reentry programs can be characterized by ongoing support for adherence (i.e., offering at least a 4-week supply of needed MOUD medication), securing basic needs (i.e., housing), and providing behavioral counseling (Substance Abuse and Mental Health Services Administration, 2019). Additionally, peer navigation, with people with relevant lived experiences related to OUD and incarceration, can increase engagement to MOUD care, support community re-entry post-release; this service can be covered by Medicaid (as rehabilitative services) (Substance Abuse and Mental Health Services Administration, 2019). Expansion and adaptation of these programs may improve MOUD access. Further, following the December 2022 overturning of the DATA-Waiver Program (or the X-Waiver), providers may have fewer bureaucratic barriers to prescribing MOUD (Substance Abuse and Mental Health Services Administration, 2024). MOUD treatment during and post-incarceration can prevent opioid overdose (Cates & Brown, 2023) and is an important strategy to address the opioid crisis in the U.S.

The 2024 National Drug Control Strategy calls for expanding access to comprehensive MOUD in all three FDA-approved forms (buprenorphine, methadone, and naltrexone) to all currently or recently incarcerated persons who need it, facilitating community re-entry, and reducing regulatory, financial, and administrative burdens to providing substance use disorder treatment at state and local correctional facilities (The White House, 2024). Additionally, people in jails and prisons can be provided pre-release MOUD and counseling services for up to 90 days prior to the expected release date, with Medicaid coverage (under the Medicaid Reentry Section 1115 Demonstration Opportunity) (The White House, 2024). Current laws and policies that enable the provision of MOUD in correctional facilities vary at the county and facility-level, with many states continuing to enact their legislation to expand access to MOUD in correctional facilities (Weizman et al., 2021). This analysis highlights the critical gap in meeting MOUD needs among recently incarcerated PWID, and therefore, underscores the importance of improving access to MOUD and current policies. It also highlights the need to continue researching the impact of incarceration history on unmet need for MOUD and non-fatal opioid overdose in rural and urban settings (Hartung et al., 2023; Hoover et al., 2023). More research is needed to inform evidence-based best practices and multi-level policies to address the institutional and systemic barriers for the implementation or expansion of comprehensive MOUD treatment programs for justice-involved populations (Grella et al., 2020) to help reduce the unmet need for MOUD among PWID.

Limitations

This analysis has some limitations. The cross-sectional design limits the ability to infer temporality of unmet need for MOUD (i.e., unmet need could have been before or after

incarceration or non-fatal opioid overdose), incarceration, and non-fatal opioid overdose. Data are subject to social desirability and recall biases. Data were not available on the reasons for MOUD unmet needs among participants or whether MOUD treatment was offered *during* incarceration or upon release (including while being under parole or probation). We also do not know how long recently incarcerated participants were detained or incarcerated, how many times they were incarcerated, or what type of facility or facilities they were detained or incarcerated in, all of which affect access to MOUD and overdose risk. More frequent periods of incarceration, for example, could disrupt care and potentially lead to a greater risk of opioid overdose. Higher overdose prevalence in the Midwest region was heavily driven by one city, which may skew results (results not shown). Future studies should explore differences in overdose prevalence by U.S. regions and the factors driving differences (i.e., naloxone distribution). Results are not generalizable to all PWID in the U.S., including PWID living in rural or suburban areas.

Conclusion

Recently incarcerated PWID with an unmet need for MOUD were more likely to report non-fatal opioid overdose compared to recently incarcerated PWID without an unmet need for MOUD. The risk of opioid overdose and incarceration is high among the PWID population. Therefore, it is important to implement evidence-based best practices and policies that ensure initiation, access to, and maintenance of low barrier MOUD treatment and continuation of care in correctional facilities and the community. The provision of naloxone and MOUD to recently incarcerated PWID to treat OUD and strengthening linkage to these services upon release it should remain a priority in correctional facilities and community-based partners.

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Data availability:

Questionnaires and protocol are available upon request from nhbs@cdc.gov.

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Highlights

- Over one fourth of recently incarcerated PWID in 20 US large cities reported an unmet need for MOUD.
- PWID with unmet need for MOUD were 1.4 times as likely to experience non-fatal opioid overdose.
- Addressing unmet need for MOUD among recently incarcerated PWID may be an opportunity for overdose prevention.
- Findings underscore a need to improve MOUD access for recently incarcerated PWID.

Table 1.

Selected characteristics of recently incarcerated PWID by non-fatal opioid-involved overdose in the past 12 months– National HIV Behavioral Surveillance, 20 large U.S. Cities, 2022.

	Overall sample (N = 1,648)		Non-fatal opioid overdose, past 12 months ¹				
			Yes (n = 649)		No (n=999)		aPR (95% CI) ²
	No.	% ²	No.	row % ²	No.	row % ²	
Race/ethnicity ⁴							
Black	558	34	197	35	361	65	0.97 (0.82, 1.14)
Hispanic or Latino	286	17	116	41	170	59	0.82 (0.67, 1.01)
Multiracial or other races	137	8	55	40	82	60	0.96 (0.80, 1.16)
White	662	40	278	42	384	58	REF
Sex							
Female	418	25	170	41	248	59	1.03 (0.90, 1.17)
Male	1218	74	476	39	742	61	REF
Age (years)							
18–24	37	2	15	41	22	59	1.20 (0.77,1.87)
25–29	150	9	54	36	96	64	1.02 (0.71, 1.47)
30–39	566	34	241	43	325	57	1.22 (1.00, 1.49)
40–49	440	27	178	40	262	60	1.15 (0.98, 1.34)
50 years or older	455	28	161	35	294	65	REF
Currently uninsured							
Yes	331	20	140	42	191	58	1.11 (0.99, 1.24)
No	1310	80	507	39	803	61	REF
Homeless, past 12 months ⁵							
Yes	1335	81	557	42	778	58	1.43 (1.27, 1.61)
No	313	19	92	29	221	71	REF
U.S. Region^{6,7}							
Northeast	257	16	102	40	155	60	1.06 (0.93,1.22)
South	573	35	238	42	335	58	1.13 (0.94, 1.35)
Midwest	206	13	90	44	116	56	1.18 (1.01, 1.38)
Territories	41	2	10	24	31	76	0.68 (0.52, 0.89)
West	571	35	209	37	362	63	REF
Unmet need for MOUD							
Yes	469	28	234	50	235	50	1.42 (1.29, 1.56)
No	1,179	72	415	35	764	65	REF

Abbreviations: aPR: adjusted prevalence ratio; CI: confidence interval; REF: reference group; MOUD – medications for opioid use disorder includes methadone, buprenorphine, Suboxone or Subutex; SSP – syringe service program

¹ Non-fatal opioid overdose in the past 12 months was measured by asking participants: “In the past 12 months, did you overdose on heroin or painkillers? By overdose, I mean if you passed out, turned blue, or stopped breathing from using drugs”.

²Model accounted for respondent-driven sampling methodology, and adjusted for network size, and city. Statistically significant results are bolded (95% CIs do not cross the null of 1.0.).

³Percentages may not sum to 100% due to rounding or missing values (<1% missingness).

⁴Race/ethnicity was mutually exclusive. Hispanic or Latino persons were classified as such, regardless of their race. Multiracial includes participants who self-identified with 2 or more racial groups. Multiracial or other races includes those who identified as American Indian or Alaska Native (n=20), Asian (n=5), Multiracial (n=105), and Native Hawaiian or other Pacific Islander (n=7).

⁵Measured by asking participants if they have lived on the street, in a shelter, in a single-room-occupancy hotel, or in a car in the past 12 months.

⁶Based on the U.S. Census regions. Northeast: Boston, Nassau, New York City, Newark, Philadelphia; South: Atlanta, Baltimore, Dallas, Houston, Miami, Memphis, New Orleans, Norfolk VA, Washington D.C.; Midwest: Chicago, Detroit, Indianapolis, St. Louis; West: Denver, Los Angeles, Portland, San Diego, San Francisco, Seattle; Territories: Puerto Rico.

⁷Model accounted for respondent-driven sampling methodology and adjusted for network size only.

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