

Washington State Jail-based Opioid Treatment Networks: Disparities in Initiation of MOUD Treatment

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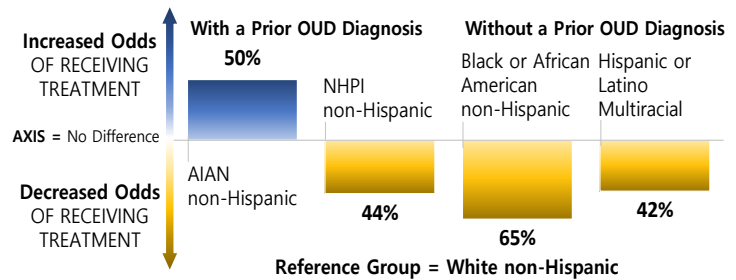
This analysis is part of an evaluation supported by the Health Care Authority's Division of Behavioral Health and Recovery to evaluate the State Opioid Response Jail-Based Opioid Treatment Networks. The State Opioid Response is a federal grant supported by Substance Abuse and Mental Health Services Administration (T1085727).

Since September 2018, the Washington State Healthcare Authority (HCA) has received State Opioid Response (SOR) grant funding from the Substance Abuse and Mental Health Services Administration. The primary objective of these grants is to enhance access to the Food and Drug Administration (FDA)-approved medications for opioid use disorder (MOUD) and reduce opioid overdose deaths. This evaluation focuses on SOR-funded MOUD treatment programs within five Washington State jails known as Opioid Treatment Networks (OTNs). Jail-based OTNs initiate MOUD treatment for individuals with opioid use disorder (OUD) prior to their release from jail. This report addresses the influence of various factors, such as race and ethnicity, prior behavioral health diagnoses and treatments, healthcare and social service utilization, and criminal legal factors, on the initiation of MOUD treatment among people who were booked into jail-based OTNs and released from January 2019 through September 2022.

Key Findings

- **Jail-based OTNs initiated 3,899 MOUD treatment events. Of those, 974 events were for persons without a prior OUD diagnosis.**
- **Among those with a prior OUD diagnosis, American Indian or Alaska Native (AIAN) non-Hispanic individuals were one-and-a-half times more likely to initiate MOUD treatment in a jail-based OTN than White non-Hispanic individuals (Figure 1).** Native Hawaiian or Pacific Islander (NHPI), Black, and Hispanic individuals were half as likely to initiate MOUD treatment in a jail-based OTN as White non-Hispanic individuals.
- **Individuals with a previous OUD diagnosis who had MOUD treatment before were three times more likely to start treatment in a jail-based OTN than those who had not.**
- **People in a jail-based OTN who were tested or screened for OUD were three to eight times more likely to start MOUD treatment compared to those who were not.**

FIGURE 1. Racial Disparities in Initiation of MOUD Treatment in Jail-based OTNs



Introduction

The population involved in the criminal legal system faces elevated rates of substance use disorder or misuse compared to the general population (Fazel et al., 2006; Mumola et al., 2007; Bronson et al., 2017). People released from incarceration are particularly susceptible to overdose death due to their reduced drug tolerance and increased access to opioids and other street substances upon release (Binswanger et al., 2013; Joudrey et al., 2019; Hartung et al., 2023).

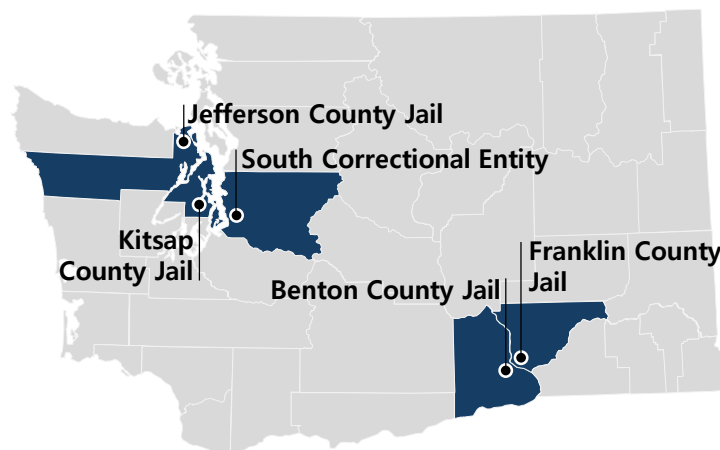
MOUD is widely recognized as the gold standard of addiction care and linked to reductions in both illicit opioid use and overdose mortality (Green et al., 2018; Mancher & Leshner, 2019; Wakeman et al., 2020). Jails and prisons provide a practical platform for effectively managing opioid withdrawal and providing MOUD treatment to individuals with OUD (Clarke et al., 2018; Moore et al., 2019). Unfortunately, MOUD remains underutilized across the United States among individuals in the criminal legal system who are at risk for overdose (Martin et al., 2023).

Efforts to expand and improve the implementation of MOUD treatment in the criminal legal system have been ongoing in Washington State since 2018 (Grande & Stern, 2018). One effort developed by the Health Care Authority (HCA) was an initiative called OTNs, designed to identify people with OUD in non-traditional treatment settings, such as jails and emergency departments, and create new pathways for treatment. In December 2018, in conjunction with other statewide efforts and after a competitive solicitation process, HCA awarded five jails SOR funds to implement an OTN.

The five jails include Benton County Jail, Franklin County Jail, Jefferson County Jail, Kitsap County Jail, and South Correctional Entity (SCORE) (Figure 2) and commenced services in January 2019. These five jails instituted processes to screen individuals for OUD upon entry to jail, initiate MOUD treatment¹ prior to release (if indicated) and refer releasees to community MOUD treatment providers for ongoing care. Processes varied across the jails (refer to Table A1 in the Appendix). For instance, some jails relied on self-disclosure of an OUD while other jails utilized universal screening. This report investigates the factors that influenced whether an individual initiated MOUD treatment among those entering the five jail-based OTNs funded by the SOR grant.

FIGURE 2.

Washington State Jail-based OTN Locations



¹ Jail-based OTNs offer FDA-approved MOUDs including buprenorphine and naltrexone or provide referrals to methadone upon release.

Data and Methods

Data Collection

As a condition of funding, jail-based OTNs routinely submitted identified participant enrollment data to the SOR evaluation team at the Department of Social and Health Services (DSHS) Research and Data Analysis Division (RDA). OTNs submitted records for any individual that initiated MOUD treatment in jail.

RDA researchers created an analytic dataset comprising all Washington State jail booking and release events at the jail-based OTNs between January 1, 2019, and September 30, 2022.² The primary data collected by the jail-based OTNs were linked to the analytic dataset of all jail booking and release events or records. Additionally, records were matched to ProviderOne (Medicaid) claims data. Only records linked to individuals with at least 6 months of Title XIX Medicaid coverage³ in the 24 months prior to booking were included in the final dataset. Records were excluded if the age of the individual was less than 18 or older than 64 at the time of booking; the jail-based OTN was no longer receiving SOR funds⁴; race or ethnicity data were incomplete; or length of the jail stay was greater than 365 days⁵ (refer to Figure A1 in the Appendix).

Prior OUD diagnoses identified in the Medicaid claims data were used to establish two analytic cohorts: records linked to individuals with and without an OUD diagnosis in the 24 months prior to booking. It is possible that individuals without a prior OUD diagnosis simply did not present as such to a medical provider or had other insurance coverage in the 24 months prior to booking. Therefore, some individuals may have had a prior OUD diagnosis not documented by Medicaid claims.

By linking booking events to several administrative data systems, we were able to create detailed descriptive profiles of individuals within the jail-based OTNs. The descriptive profiles highlight behavioral health diagnoses and treatments, healthcare and social service utilization, and criminal legal factors in the 24 months prior to booking.⁶ The final analytic sample in this evaluation comprises 61,366 jail booking events involving 29,597 unique individuals.

Analytic Approach

This evaluation utilized univariate statistics to describe characteristics including age, race and ethnicity, behavioral health diagnoses and treatments, healthcare and social service utilization, and criminal legal factors. Furthermore, these measures were analyzed for the overall study population and separately for records connected to individuals with and without a prior OUD diagnosis.

The key outcome measure in this evaluation was initiation of MOUD treatment as reported by the OTNs. Commonly accepted multivariate statistical techniques were used to evaluate initiation of MOUD treatment and identify factors that could influence the odds of initiating MOUD treatment, including age, gender, race and ethnicity; mental health and substance use diagnoses and treatments; prior MOUD treatment; homelessness or unstable housing; and prior arrests and incarceration in a jail or prison.

Using multivariate logistic regression models (see Technical Notes for more information), researchers estimated relevant odds ratios (ORs) that are summarized in the results (Greenland, 1989; McHugh,

² Washington State jail booking events were identified using the Jail Booking and Reporting System (JBRS) and ProviderOne (Medicaid) administrative data provided to the DSHS RDA.

³ Records with dual eligibility for Medicare in the 3 months prior to booking are excluded.

⁴ Jefferson County Jail stopped receiving SOR funds in October 2021; therefore, records from October 1st onward were excluded from the analysis.

⁵ Jail spans greater than one year include records with likely incorrect booking and release dates or longer-term Department of Corrections jail spans that are outside the scope of this analysis.

⁶ Distinct individuals may be represented in the data multiple times as this was an event-based evaluation.

2009). The associated figures depict how different factors related to initiation of MOUD treatment, showing both the strength and direction of each relationship. ORs are less than one or greater than one. An OR of 2.0 means a two-fold increased likelihood of the outcome (e.g., twice as likely to initiate MOUD treatment) whereas an OR of 0.5 indicates a reduced likelihood of the outcome (e.g., half as likely to initiate MOUD treatment).

What Is an Odds Ratio?

EXAMPLE: In a hypothetical population, 5 percent of persons with an opioid use disorder were diagnosed with a depression disorder, compared to 3 percent of persons without an opioid use disorder.

- **Odds Ratio** = $\frac{(0.05 \times (1 - 0.05))}{(0.03 \times (1 - 0.03))} = 1.6$

In this hypothetical population, the odds of being diagnosed with depression is nearly twice as likely for persons with an opioid use disorder, relative to persons without an opioid use disorder.

Results

Characteristics of the Study Population

Individuals with a Prior OUD Diagnosis

About two out of five (38 percent) individuals booked into a jail-based OTN had medical claims indicating an OUD diagnosis in the 24 months prior to booking. Among booking events where the individual had a prior OUD diagnosis (n = 23,588), the majority were male (69 percent), White non-Hispanic⁷ (56 percent) and they averaged 33.7 years of age at the time of booking (Figure 3). The average length of jail stay was 14 days. Nearly two out of three events (62 percent) had MOUD treatment prior to booking, most commonly buprenorphine (82 percent); 39 percent had an alcohol use disorder (AUD); 77 percent had a stimulant use disorder diagnosis; 82 percent had a mental health disorder diagnosis, most commonly anxiety and depression; 32 percent had a chronic illness risk score greater than one (see Technical Notes for more information); and 79 percent experienced homelessness or housing instability. This cohort averaged four prior arrests in the 24 months prior to the index booking event and 47 percent were in a jail or prison for at least one day in the 3 months prior to booking; 80 percent were in jail or prison in the 12 months prior to booking.

Individuals without a Prior OUD Diagnosis

Among booking events where the individual did not have a prior OUD diagnosis (n = 37,778), most were male (74 percent), White non-Hispanic (43 percent), and they averaged 35.2 years of age at the time of booking (Figure 4). The average length of jail stay was 12 days. While it is not expected this population would receive prior MOUD treatment, two percent received naltrexone, likely for the treatment of AUD.⁸ One in four events (25 percent) were associated with individuals who had been diagnosed with AUD, while 32 percent had a stimulant use disorder diagnosis; 57 percent had a mental health disorder diagnosis, and similar to the other cohort, anxiety and depression were the most common; 18 percent had a chronic illness risk score greater than one; and 61 percent experienced homelessness or housing instability. This cohort averaged three prior arrests in the 24 months prior to the index booking event and 36 percent were in a jail or prison for at least one day in the 3 months prior to booking; 64 percent did so in the 12 months prior to booking.

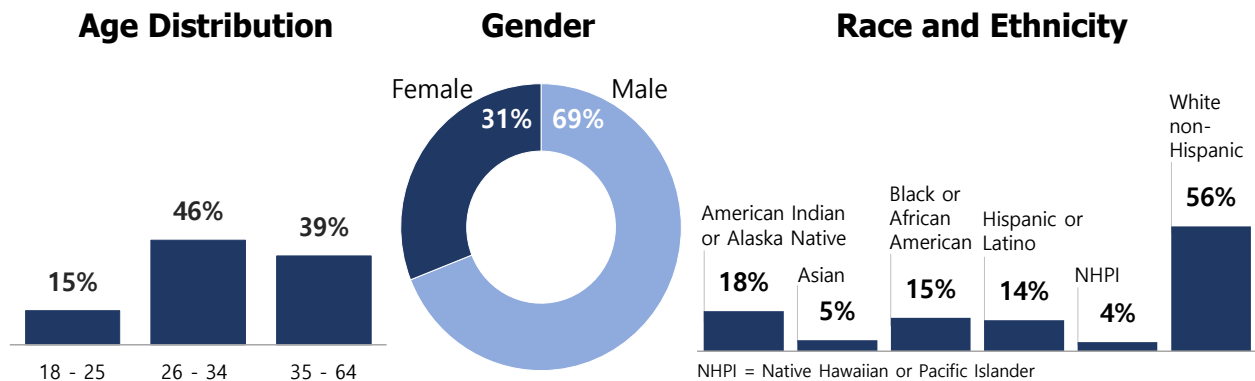
⁷ Percentage reflects the federal Office of Management and Budget's race and ethnicity reporting standard.

⁸ Naltrexone can be used to treat OUD and alcohol use disorder (AUD).

FIGURE 3.

Jail Bookings with an OUD Diagnosis

TOTAL = 23,588

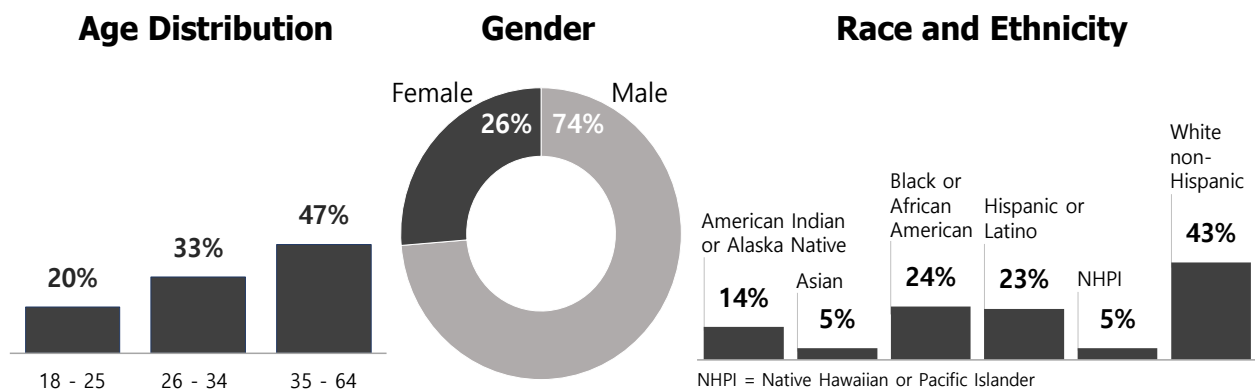


NOTE: Race and ethnicity in Figure 3 are not mutually exclusive. White non-Hispanic excludes selection of other race categories and Hispanic or Latino. See Technical Notes for more information.

FIGURE 4.

Jail Bookings without an OUD Diagnosis

TOTAL = 37,778



NOTE: Race and ethnicity in Figure 4 are not mutually exclusive. White non-Hispanic excludes selection of other race categories and Hispanic or Latino. See Technical Notes for more information.

Evaluation of Initiation of MOUD Treatment

Individuals with a Prior OUD Diagnosis

There were 2,925 MOUD treatment initiation events among those with a prior OUD diagnosis. Racial disparities occurred for Native Hawaiian or Pacific Islander (NHPI) non-Hispanic⁹ individuals, who were nearly half as likely (OR = 0.56) as White non-Hispanic individuals to initiate MOUD treatment (Figure 5). On the other hand, American Indian or Alaska Native (AIAN) non-Hispanic individuals were one-and-a-half times as likely (OR = 1.5) to initiate MOUD treatment than White non-Hispanic individuals.

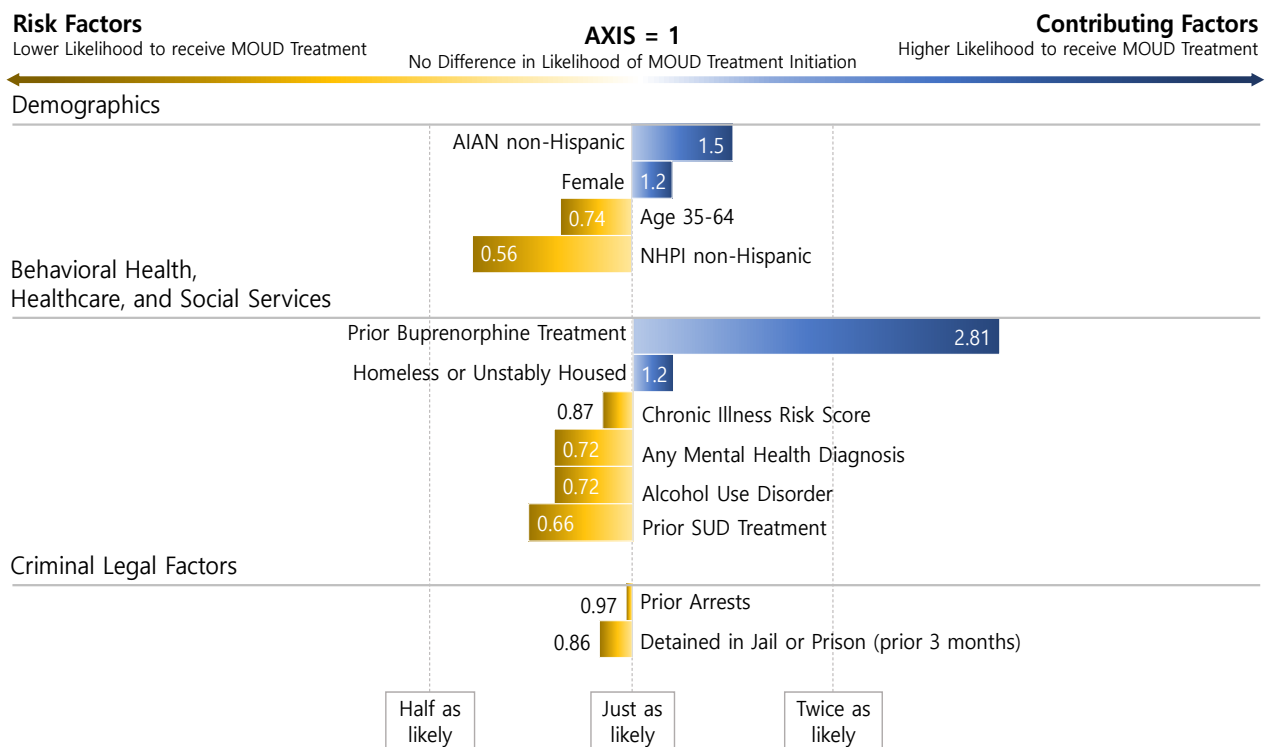
⁹ Race and ethnicity are mutually exclusive for this evaluation. Categories are based on a modified version of the Department of Children, Youth, and Families' categorization methods and the federal Office of Management and Budget's reporting standards.

Other demographic differences found were females being more likely (OR = 1.2) to initiate treatment than males; and 35- to 64-year-olds being less likely (OR =0.74) to initiate treatment than 18- to 25-year-olds. Among other racial groups, no disparities were found.

Individuals with prior medical claims for buprenorphine treatment were almost three times as likely (OR = 2.81) to initiate MOUD treatment as those without. Prior mental health or AUD diagnoses or any substance use disorder (SUD) treatment exposure lowered odds of initiating MOUD treatment. Lastly, the likelihood of initiating MOUD treatment was slightly lower for those with a recent jail or prison stay (within 3 months of booking) compared to those without.

FIGURE 5.

Factors Associated with Initiation of MOUD Treatment among Individuals with a Prior OUD Diagnosis



NOTE: Only statistically significant odds ratios (ORs) are presented. Model results for initiation of MOUD treatment are restricted to individuals with a prior OUD diagnosis. Axes may differ in other Figures. All measures reflect the 24 months prior to the booking event unless noted otherwise. See Technical Notes for a description of measures and reference groups in multivariate logistic regression. Age 18-25 and White non-Hispanic are the reference groups for age, race and ethnicity comparisons.

The odds of initiating MOUD treatment increased as the length of jail stay increased. Individuals previously diagnosed with OUD and serving a length of jail stay 16 days or longer were 39 times more likely to initiate MOUD treatment compared to people incarcerated fewer than 3 days (Figure 6).

Individuals without a Prior OUD Diagnosis

There were 974 MOUD treatment initiation events among individuals without a prior OUD diagnosis. Racial disparities among those initiating treatment were more pronounced in this cohort. Individuals without a previously diagnosed OUD and who identified as Black or African American non-Hispanic, or Hispanic or Latino Multiracial were less likely to initiate MOUD treatment compared to White non-Hispanic individuals (Figure 7). The magnitude of the disparity was largest for Black or African American non-Hispanic individuals.

Within this cohort, there were also differences among the age groups: 26- to 34-year-olds were more likely to initiate treatment, and 35- to 64-year-olds were less likely to initiate treatment than 18- to 25-year-olds.

Individuals who experienced homelessness or housing instability in the 24 months prior to booking were almost twice as likely to initiate MOUD treatment as those who did not. Individuals with prior diagnoses of stimulant use disorder, mental health disorders, or an AUD had decreased odds of initiating MOUD treatment (Figure 7) compared to those without these disorders. Lastly, the likelihood of initiating MOUD treatment was slightly higher for those with a recent jail or prison stay (within 3 and 12 months of booking).

FIGURE 6.
Length of Stay in a Jail-based OTN Increases Odds of Initiating MOUD Treatment among those with a Previously Diagnosed OUD

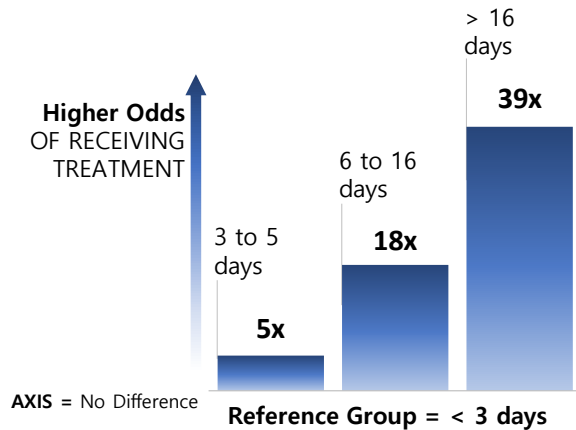
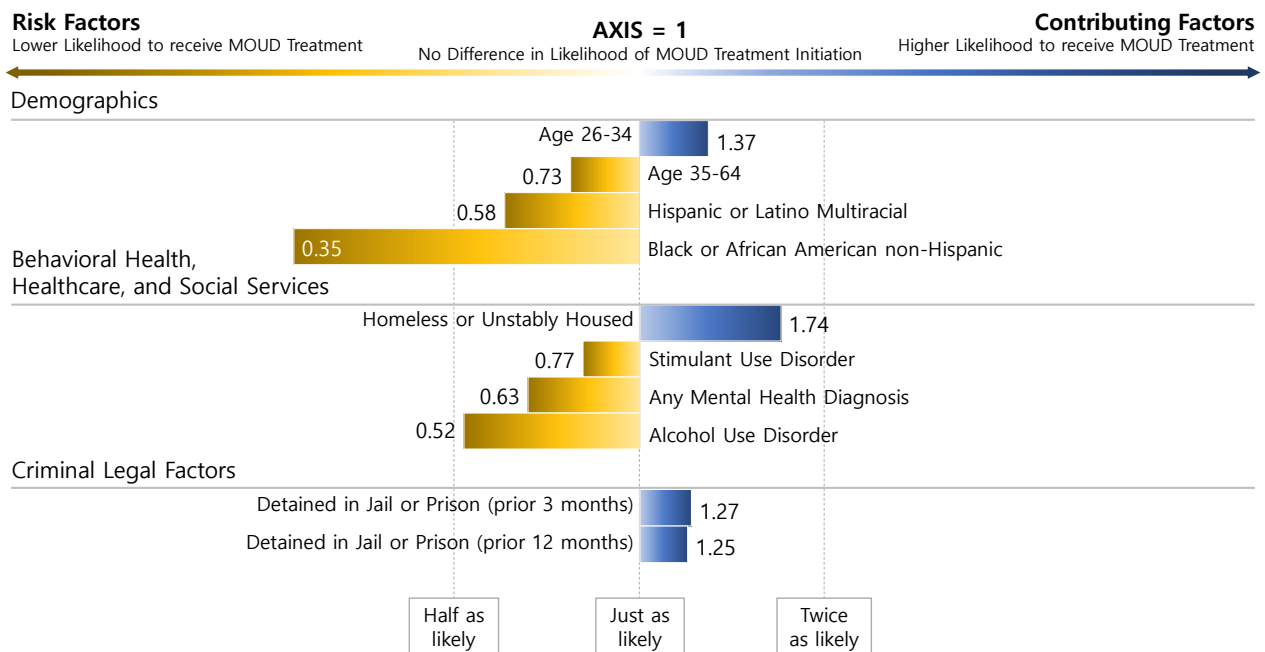


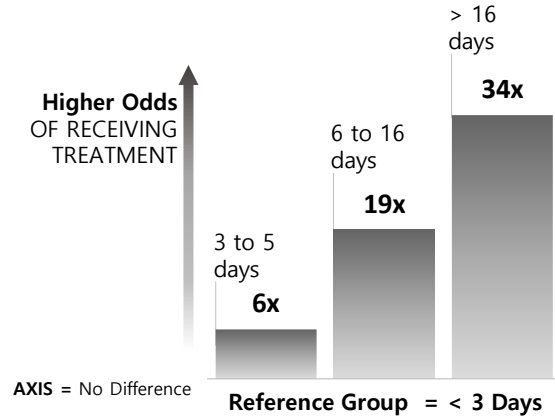
FIGURE 7.
Factors Associated with Initiation of MOUD Treatment among Individuals without a Prior OUD Diagnosis



NOTE: Only statistically significant ORs are presented. Model results for initiation of MOUD treatment are restricted to individuals without a prior OUD diagnosis. Axes may differ in other Figures. All measures reflect the 24 months prior to the booking event unless noted otherwise. See Technical Notes for a description of measures and reference groups in multivariate logistic regression. Ages 18-25 and White non-Hispanic are the reference groups for age, race and ethnicity comparisons.

For individuals without a prior OUD diagnosis, the relationship between the length of jail stay and the likelihood of initiating MOUD treatment is like that of individuals with a prior OUD diagnosis. They experience comparable odds of initiating MOUD treatment based on the length of their jail stay (Figure 8).

FIGURE 8.
Length of Stay in a Jail-based OTN Increases Odds of Initiating MOUD Treatment among those without a Previously Diagnosed OUD



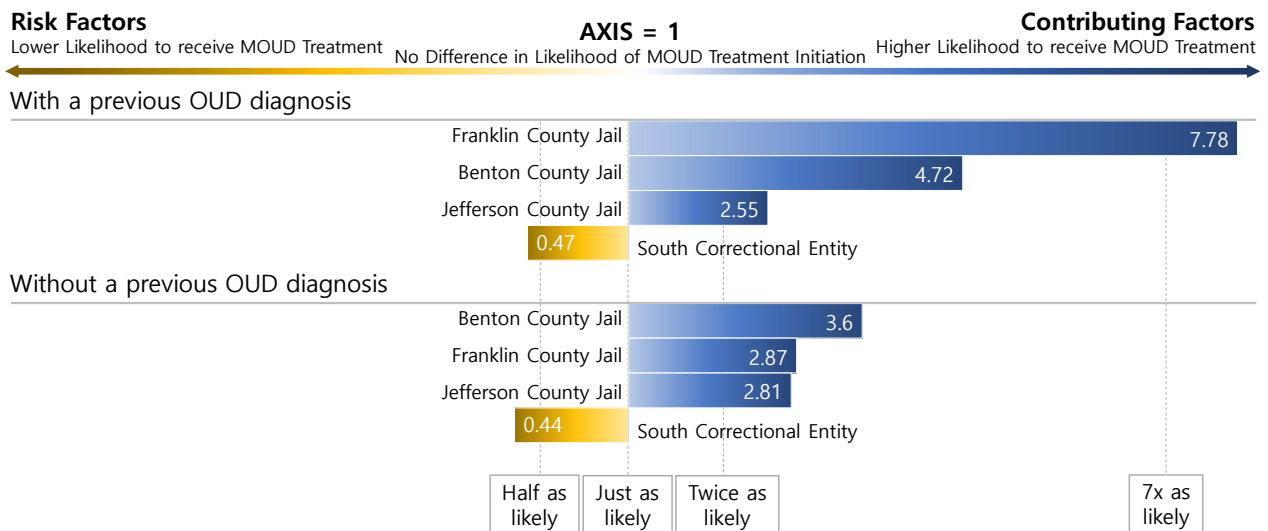
Jail-based OTNs: Cross-site Comparisons

Among the five jail-based OTNs, the odds of initiating MOUD treatment differed by facility (Figure 9). For example, those with a prior OUD diagnosis at Franklin County Jail and Benton County Jail were nearly eight and five times as likely, respectively, to initiate MOUD treatment compared to those at Kitsap County Jail.¹⁰ Alternatively, individuals at SCORE were about half as likely to initiate MOUD treatment as those at Kitsap County Jail.

A stay at an OTN jail may provide an opportunity to identify a previously undiagnosed OUD. Those without a prior OUD diagnosis were between three to four times more likely to initiate MOUD treatment if they were booked into Benton, Franklin, or Jefferson County Jails compared to Kitsap County Jail. At SCORE, those without an OUD diagnosis were half as likely to initiate treatment as individuals at Kitsap County Jail.

FIGURE 9.

Initiation of MOUD Treatment at Jail-based OTNs



NOTE: Only statistically significant ORs are presented. Axes may differ in other Figures. See Technical Notes for a description of measures and reference groups in multivariate logistic regression. Kitsap County Jail is the reference group.

¹⁰ Kitsap County Jail was selected as the reference group to ensure that the presented coefficients are positively signed. See Technical Notes for more information.

Discussion

The needs of incarcerated individuals, who often come from historically excluded racial and ethnic groups, are frequently unaddressed (Provine, 2011; Duncan et al., 2014). In the last two years, fentanyl-related overdose deaths have surged disproportionately among people of color including AIAN and Black or African American populations (Karissa et al., 2022). However, the opioid crisis is still largely considered a White non-Hispanic epidemic (James & Jordan, 2018). Systemic racism in the legal and healthcare systems further exacerbates existing health disparities including treatment of OUD among individuals in the criminal legal system (Volkow, 2021).

In this evaluation, we observed racial disparities in who initiated MOUD treatment in jail-based OTNs. Among those with a previous OUD diagnosis, individuals identified as NHPI non-Hispanic, were half as likely to initiate MOUD treatment as White non-Hispanic individuals. Interestingly, AIAN non-Hispanic individuals were more likely to initiate MOUD treatment in a jail-based OTN compared to White non-Hispanic individuals. Considering this finding, it is important to note that Washington State has several prevention programs targeting specific populations. The *For Our Lives* campaign, for example, is a prevention effort that specifically targets AIAN populations.¹¹ It aims to address opioid misuse by providing education and support to Tribal communities. The campaign emphasizes storytelling and collaboration with Tribes and Urban Indian organizations to combat the opioid public health crisis. Funded by the Washington State HCA, it focuses on strengths-based approaches for AIAN communities.

Racially minoritized groups without a prior OUD diagnosis experienced disparities in initiating MOUD treatment in jail-based OTNs. Disparities for individuals identified as Black or African American non-Hispanic and Hispanic or Latino Multiracial were particularly high (about half as likely to initiate MOUD treatment as White non-Hispanic individuals). It is possible that in this case, disparities might be due to the screening processes instituted at jail-based OTNs, which may disadvantage certain groups. Recent literature reveals that people who are Black or African American, AIAN, Asian, NHPI, or Hispanic or Latino are half as likely to receive MOUD treatment as White non-Hispanic individuals, which is consistent with the findings in this evaluation (Lagisetty et al., 2019; Hollander et al., 2021; Dunphy et al., 2022; Barnett et al., 2023). The literature highlights distrust and prevailing cultural beliefs as factors that hinder MOUD treatment access among Black or African American and Hispanic or Latino patients (Barnett et al., 2023). Cultural differences may play a role in shaping trust toward healthcare professionals, particularly within correctional settings. To address this, agencies implementing OUD screening and MOUD treatment in correctional settings could benefit by improving staff cultural competencies and training their staff in stigma reduction.

There were significant disparities across the five jail-based OTNs with respect to the likelihood of individuals initiating MOUD treatment. Individuals with a prior OUD diagnosis booked into Franklin County Jail were more likely to initiate MOUD treatment compared to other jail-based OTNs. Interestingly, Franklin County Jail's medical director reported using a universal screening protocol at booking which may have contributed to this finding. Conversely, Benton County Jail's practice of drug testing at booking may have increased the likelihood of initiating MOUD among individuals without a prior OUD diagnosis. This could be because they might not have appeared to need treatment to a medical provider, were less likely to self-report opioid use, or had different insurance coverage in the 24 months before booking.

¹¹ For more information on the For Our Lives campaign see <https://forourlives.org/>

In contrast, individuals at SCORE, regardless of their prior OUD diagnosis status, were half as likely to initiate treatment as individuals at Kitsap County Jail. SCORE, despite being the largest facility with the highest number of booking events and OUD diagnoses in the analytic sample, had the lowest likelihood of initiating MOUD treatment relative to its population size. This finding may be influenced by the facility's size or its specific implementation strategies of the jail-based OTN program. Given the higher likelihoods of initiating MOUD treatment at Franklin County Jail and Benton County Jail, other jails may consider adopting drug testing and universal screening (Scott et al., 2022). It is important to acknowledge, as discussed previously, that some populations may be less likely to self-report or have concerns around stigma or further punitive measures if they self-disclose opioid use.

Lastly, individuals who had prior buprenorphine treatment claims before their booking event were nearly three times more likely to initiate MOUD treatment in a jail-based OTN. Individuals with prior MOUD treatment experience may be more amenable to continuing MOUD treatment while incarcerated. Additionally, initiating MOUD in jail can alleviate the side effects of opioid withdrawal. Effective medically managed withdrawal is crucial for treating OUD, particularly within jails (DOJ, 2023).

Study Limitations

This evaluation is subject to the following limitations. First, this is an observational and cross-sectional analysis limited to administrative records and Medicaid claims data. Therefore, the evaluation is limited to those receiving publicly funded services. Individuals encountering barriers to publicly funded service will not be represented in relevant data systems used for the evaluation. Furthermore, some people without a previous OUD diagnosis might not have disclosed their condition to a healthcare provider or had different insurance coverage in the 24 months before the index booking event. As a result, there could be individuals with a previous OUD diagnosis not recorded in Medicaid claims. On the other hand, some individuals without a prior OUD diagnosis with claims for buprenorphine or methadone may have received off-label prescriptions for chronic pain. Second, race and ethnicity data were generated from multiple sources, likely introducing errors in the descriptive data and analyses. Future analyses should identify a single, accurate source for this data. Third, the evaluation period occurred before and during the COVID-19 pandemic, which impacted arrests, health care service delivery, and caused workforce shortages. Additional analysis beyond the COVID-19 pandemic is necessary to confirm these results.

Fourth, in February 2021, the Washington State Supreme Court decided the case of the *State of Washington v. Blake*, which struck down RCW 69.50.4013, possession of a controlled substance. The Supreme Court determined Washington's criminal statute unconstitutional and in violation of the due process clause. This decision allowed for the vacating, amending, or dismissing of convictions under RCW 69.50.4013 from 1971 to 2021, thereby impacting booking events and the analytic sample. In response to the Supreme Court's decision, the Legislature passed Engrossed Senate Bill 5476¹², which encourages prosecutors and law enforcement to refer individuals arrested for simple possession to assessment and treatment for their first two arrests, and optionally for any subsequent arrests, instead of booking them in jail. Given this, it is likely that the type of charge influenced the client's length of stay in jail and their opportunity to initiate MOUD treatment during this study period. RDA researchers were unable to differentiate between the types of charges incurred by individuals (e.g., possession of controlled substances, property offenses, etc.).

¹² Engrossed Substitute Senate Bill 5693 allocated supplemental operating budget appropriations for the 2021-2023 biennium to enhance efforts in providing MOUD in city, county, regional, and tribal jails. This funding supports 15 contracted partners representing 19 jails. For more information on MOUD funding in jails see <https://www.hca.wa.gov/assets/program/leg-report-moud-jails-20221216.pdf>

Finally, this evaluation utilized an event-based analysis, allowing for the possibility of multiple records for an individual in the dataset. To account for dependence among an individual's multiple records, commonly accepted statistical techniques were applied. However, additional research is needed to unravel the complex effects of prior jail-based OTN treatment on re-initiating MOUD treatment during consecutive bookings at the same or different jail-based OTN.

Directions for Future Research

It remains crucial to qualitatively explore why individuals are offered or initiate MOUD treatment in jail and identify potential improvements in the implementation of MOUD treatment in jails. Understanding the motivations for starting MOUD treatment and contextual factors behind implementation can inform more effective interventions and supports for individuals seeking recovery. An important consideration for improving processes includes recent and successful legal challenges finding that the failure to provide MOUD to individuals while incarcerated violates the Americans with Disabilities Act (Brezel et al., 2020; ACLU, 2021). Additionally, culturally competent, and tailored approaches are needed to engage individuals with OUD who identify as members of historically marginalized racial or ethnic groups and shift the focus towards equitable treatment of substance use disorders among all races and ethnicities.

Policy Implications

Prior to 2016, Medicaid coverage among individuals involved with the criminal legal system was terminated upon incarceration. In recent years, the Washington State legislature has enacted several bills that only suspend Medicaid coverage, delay suspension of Medicaid coverage, and allow HCA to seek federal funding for prerelease services and enhanced care coordination. These legislative efforts contributed to HCA's Medicaid Transformation Project (MTP) established through an 1115 waiver agreement with the Centers for Medicare & Medicaid Services. The MTP provides Washington State with the opportunity to offer reentry programs and specific Medicaid services up to 90 days before an individual is released. In the context of this evaluation, it is assumed MOUD treatment coverage funded by Medicaid ceased among individuals upon incarceration.

An important insight from this analysis is that jail-based OTNs contribute to closing the gap in MOUD coverage during critical rehabilitation periods. However, disparities existed in who initiated treatment. Future efforts in correctional settings should proactively address these disparities, and further research should investigate potential inequities in prerelease services, specifically focusing on MOUD treatment for individuals benefiting from the MTP waiver.

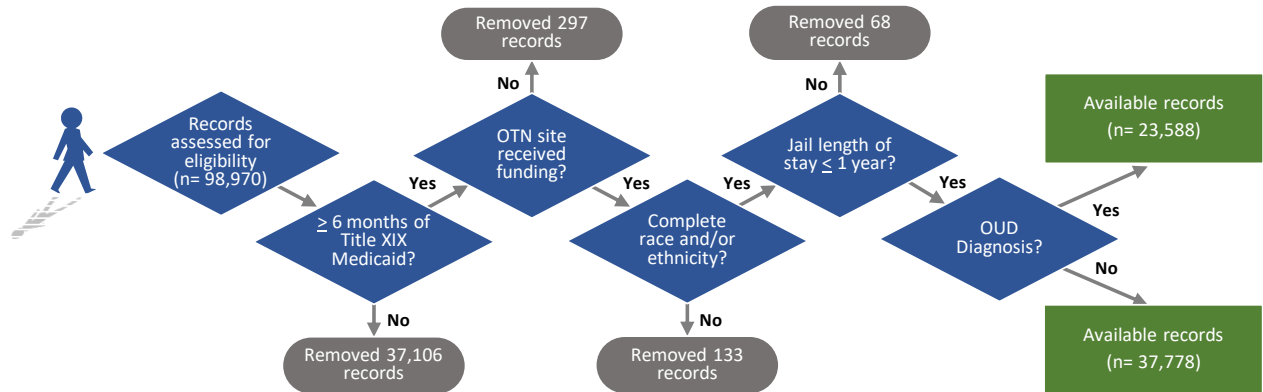
TABLE A1.

Jail-based OTN MOUD Protocols

OTN Jail	Initial OUD Screening	OUD Diagnosis & Monitoring	MOUD treatment initiation	Ongoing MOUD treatment procedures	Naloxone training and kit provided	Post-release MOUD treatment procedures
Benton County	Drug testing; voluntary disclosure	Assessment	Community SUD treatment provider hosts clinic twice a week	6 days a week in mornings	Not specified	Appt. scheduled with community SUD treatment provider; transport provided
Franklin County	Intake screening	Assessment; severity of withdrawal	Symptom treatment to maintenance treatment	3 days a week; observed for 5 mins	Yes	Patients referred to community SUD treatment provider
Jefferson County	Drug testing; voluntary disclosure	Assessment; severity of withdrawal	Within 24 hours of identification	Cohort housing assignments; observation; counseling	Not specified	Patients referred to community SUD treatment provider if living locally
Kitsap County	Drug testing; intake screening; voluntary disclosure	Assessment	Community SUD treatment provider hosts clinic twice a week; excludes prison transfers	Daily	Yes	Appt. scheduled with community SUD treatment provider; transport provided to appt. or pharmacy
SCORE	Intake screening; voluntary disclosure	Assessment	Symptom treatment	Daily	Not specified	Appt. scheduled with community SUD treatment provider; transport provided

NOTE: Appt. = appointment; MOUD = medications for opioid use disorder; OUD = opioid use disorder; SUD = substance use disorder. After-care procedures often include observation to avoid diversion (i.e., “cheeking”).

FIGURE A1.
Sample Selection



NOTE: Records with dual eligibility for Medicare in the 3 months prior to booking are excluded. Jefferson County Jail stopped receiving SOR funds in October 2021; therefore, records from October 1st onward were excluded from the analysis. Jail spans greater than one year include records with likely incorrect booking and release dates or longer-term Department of Corrections jail spans outside the scope of this analysis.

TABLE A2.

Odds Ratios for Factors Impacting MOUD Treatment Initiation

	No Prior OUD Diagnosis					
	Prior OUD Diagnosis			No Prior OUD Diagnosis		
	aOR	95% CL		aOR	95% CL	
Age as of Booking Date						
Age 18-25 (reference)						
Age 26-34	0.89	0.77	1.04	1.37	1.10	1.71
Age 35-64	0.74	0.63	0.87	0.73	0.58	0.92
Gender						
Female	1.20	1.07	1.34	1.19	0.98	1.43
Male (reference)						
Race and Ethnicity						
AIAN non-Hispanic	1.50	1.09	2.06	0.68	0.34	1.37
AIAN Multiracial	0.78	0.45	1.35	0.46	0.19	1.11
AIAN White	0.96	0.82	1.13	0.92	0.73	1.16
Asian non-Hispanic	1.21	0.78	1.89	0.42	0.15	1.20
Black or African American non-Hispanic	0.76	0.56	1.04	0.35	0.23	0.54
Black or African American Multiracial	0.82	0.35	1.91	0.23	0.05	1.02
Black or African American White	0.86	0.67	1.09	0.74	0.52	1.06
Hispanic or Latino Multiracial	0.92	0.77	1.10	0.58	0.46	0.74
NHPI non-Hispanic	0.56	0.36	0.87	0.96	0.58	1.60
White non-Hispanic (reference)						
Behavioral Health						
Any Mental Health Diagnosis	0.72	0.62	0.84	0.63	0.53	0.74
Alcohol Use Disorder	0.72	0.64	0.81	0.52	0.41	0.66
Stimulant Use Disorder	1.11	0.97	1.27	0.77	0.62	0.94
Prior SUD Treatment	0.66	0.55	0.79	1.13	0.90	1.43
Prior Buprenorphine Treatment	2.81	2.42	3.27			
Prior Methadone Treatment	1.09	0.92	1.28			
Prior Naltrexone Treatment	0.88	0.72	1.07			
Medically Managed Withdrawal	1.00	0.87	1.15	0.64	0.37	1.13
Prior MOUD Treatment (prior 3 months)	0.90	0.80	1.02			
Healthcare and Social Services						
Chronic Illness Risk Score (>1)	0.87	0.78	0.97	0.96	0.78	1.20
Homeless or Unstably Housed	1.20	1.05	1.37	1.74	1.46	2.08

	No Prior OUD Diagnosis					
	Prior OUD Diagnosis			No Prior OUD Diagnosis		
	aOR	95% CL		aOR	95% CL	
Criminal Legal Factors						
Benton County Jail	4.72	4.08	5.45	3.60	2.88	4.50
Franklin County Jail	7.78	6.30	9.61	2.87	2.15	3.84
Jefferson County Jail	2.55	1.88	3.46	2.81	1.51	5.22
Kitsap County Jail (reference)						
South Correctional Entity	0.47	0.40	0.54	0.44	0.34	0.57
Prior Arrests	0.97	0.95	0.99	1.01	0.98	1.04
Detained in Jail or Prison (prior 3 months)	0.86	0.77	0.95	1.27	1.09	1.48
Detained in Jail or Prison (prior 12 months)	1.11	0.95	1.30	1.25	1.01	1.56
Length of Jail Stay < 3 days (reference)						
Length of Jail Stay 3 to 5 days	5.18	4.03	6.64	6.25	4.08	9.58
Length of Jail Stay 6 to 16 days	18.24	14.58	22.81	19.16	12.73	28.84
Length of Jail Stay > 16 days	38.74	30.96	48.49	34.42	23.07	51.35

NOTE: Adjusted odds ratios in **Bold** are considered significant with an alpha < 0.05. aOR = adjusted odds ratio, 95% CL = 95% confidence limits. If CL includes 1.00 then it is not significant, and its meaning could not be interpreted. Analyses include only n=23,588 (prior OUD diagnosis) and n=37,778 (no prior OUD diagnosis) OTN events. Models are adjusted for age, race and ethnicity, behavioral health diagnoses and treatments, healthcare and social service utilization, and criminal legal factors. All measures reflect the 24 months prior to booking unless noted otherwise. See Technical Notes for a description of measures and more information on race and ethnicity categories.

TABLE A3.

Descriptive Statistics for Individuals with Medicaid in the 24 Months Prior to Booking

	All Jail Bookings		Prior OUD Diagnosis						No Prior OUD Diagnosis					
			MOUD Initiation			No MOUD Initiation			MOUD Initiation			No MOUD Initiation		
	N	%	TOTAL		N	%	N	%	TOTAL		N	%	N	%
			N	%					N	%				
Records	61,366	100	23,588	100	2,925		20,663	100	37,778	100	974	100	36,804	100
Unduplicated Individuals	29,597		10,862		2,036		10,231		20,716		806		20,415	
Age as of Booking Date														
18 to 25	11,076	18%	3,506	15%	531	18%	2,975	14%	7,570	20%	174	18%	7,396	20%
26 to 34	23,070	38%	10,785	46%	1,443	49%	9,342	45%	12,285	33%	445	46%	11,840	32%
35 to 64	27,220	44%	9,297	39%	951	33%	8,346	40%	17,923	47%	355	36%	17,568	48%
Age*	34.6	10.0	33.7	8.5	32.2	7.7	33.9	8.6	35.2	10.7	32.9	8.4	35.3	10.8
Gender														
Female	17,237	28%	7,307	31%	968	33%	6,339	31%	9,930	26%	226	23%	9,704	26%
Male	44,129	72%	16,281	69%	1,957	67%	14,324	69%	27,848	74%	748	77%	27,100	74%
Race and Ethnicity														
AIAN non-Hispanic	995	2%	485	2%	69	2%	416	2%	510	1%	<11	-	-	-
AIAN Multiracial	945	2%	223	1%	14	0.5%	209	1%	722	2%	<11	-	-	-
AIAN White	7,695	13%	3,453	15%	442	15%	3,011	15%	4,242	11%	127	13%	4,115	11%
Asian non-Hispanic	1,033	2%	372	2%	33	1%	339	2%	661	2%	<11	-	-	-
Black or African American non-Hispanic	5,743	9%	1,348	6%	61	2%	1,287	6%	4,395	12%	30	3%	4,365	12%
Black or African American Multiracial	576	1%	164	1%	11	0.4%	153	1%	412	1%	<11	-	-	-
Black or African American White	4,160	7%	1,387	6%	134	5%	1,253	6%	2,773	7%	55	6%	2,718	7%
Hispanic or Latino Multiracial	9,270	15%	2,448	10%	430	15%	2,018	10%	6,822	18%	190	20%	6,632	18%
NHPI non-Hispanic	1,738	3%	557	2%	28	1%	529	3%	1,181	3%	23	2%	1,158	3%
White non-Hispanic	29,211	48%	13,151	56%	1,703	58%	11,448	55%	16,060	43%	524	54%	15,536	42%
Behavioral Health														
Any Mental Health Diagnosis	40,684	66%	19,337	82%	2,371	81%	16,966	82%	21,347	57%	458	47%	20,889	57%
Attention Deficit Hyperactivity Disorder	4,305	7%	2,196	9%	321	11%	1,875	9%	2,109	6%	59	6%	2,050	6%
Adjustment Disorder	3,140	5%	1,471	6%	133	5%	1,338	6%	1,669	4%	19	2%	1,650	4%
Anxiety Disorder	24,285	40%	12,389	53%	1,568	54%	10,821	52%	11,896	31%	231	24%	11,665	32%
Conduct Disorder	3,236	5%	1,399	6%	120	4%	1,279	6%	1,837	5%	24	2%	1,813	5%
Depression Disorder	21,190	35%	10,520	45%	1,218	42%	9,302	45%	10,670	28%	183	19%	10,487	28%
Mania Bipolar Disorder	7,748	13%	3,817	16%	382	13%	3,435	17%	3,931	10%	76	8%	3,855	10%

	All Jail Bookings		Prior OUD Diagnosis						No Prior OUD Diagnosis					
			No MOUD Initiation						No MOUD Initiation					
			MOUD Initiation			MOUD Initiation			MOUD Initiation			MOUD Initiation		
			TOTAL			TOTAL			TOTAL			TOTAL		
	N	%	N	%	N	%	N	%	N	%	N	%		
Psychotic Disorder	10,409	17%	4,468	19%	304	10%	4,164	20%	5,941	16%	75	8%	5,866	16%
Post-traumatic Stress Disorder	8,792	14%	4,398	19%	477	16%	3,921	19%	4,394	12%	64	7%	4,330	12%
Mental Health Inpatient Hospitalization	5,264	9%	2,322	10%	152	5%	2,170	11%	2,942	8%	34	3%	2,908	8%
Mental Health Outpatient Treatment	27,412	45%	12,845	54%	1,496	51%	11,349	55%	14,567	39%	289	30%	14,278	39%
Alcohol Use Disorder	18,825	31%	9,276	39%	1,048	36%	8,228	40%	9,549	25%	147	15%	9,402	26%
Stimulant Use Disorder	30,154	49%	18,151	77%	2,391	82%	15,760	76%	12,003	32%	303	31%	11,700	32%
SUD Treatment	27,630	45%	18,949	80%	2,488	85%	16,461	80%	8,681	23%	208	21%	8,473	23%
Buprenorphine Treatment	12,182	20%	11,938	51%	2,061	70%	9,877	48%	244	1%	37	4%	207	1%
Methadone Treatment	-	-	3,279	14%	262	9%	3,017	15%	<11	-	-	-	<11	-
Naltrexone Treatment	2,561	4%	1,963	8%	184	6%	1,779	9%	598	2%	12	1%	586	2%
Medically Managed Withdrawal	5,280	9%	4,036	17%	542	19%	3,494	17%	1,244	3%	23	2%	1,221	3%
MOUD Treatment (prior 3 months)	5,482	9%	5,396	23%	911	31%	4,485	22%	86	0.2%	12	1%	74	0.2%
MOUD Treatment (prior 24 months)	15,383	25%	14,539	62%	2,202	75%	12,337	60%	844	2%	49	5%	795	2%
Healthcare and Social Services														
Medicaid Enrollment*	20.1	5.2	20.4	4.8	20.2	4.9	20.5	4.8	19.9	5.5	19.2	5.6	19.9	5.5
Basic Food Assistance	53,582	87%	21,656	92%	2,694	92%	18,962	92%	31,926	85%	855	88%	31,071	84%
Emergency Department (ED) Utilization	46,700	76%	19,878	84%	2,464	84%	17,414	84%	26,822	71%	657	67%	26,165	71%
ED Utilization Rate*	3.9	7.7	5.0	9.1	4.0	5.5	5.2	9.5	3.1	6.5	2.0	2.7	3.1	6.6
Employment	31,096	51%	10,816	46%	1,392	48%	9,424	46%	20,280	54%	395	41%	19,885	54%
Employed Quarters*	1.9	2.5	1.5	2.1	1.4	1.9	1.5	2.1	2.2	2.7	1.3	2.0	2.2	2.7
Hospitalization	11,964	19%	6,406	27%	657	22%	5,749	28%	5,558	15%	85	9%	5,473	15%
Hospitalization Rate*	0.4	1.1	0.5	1.4	0.3	0.8	0.6	1.5	0.3	0.9	0.1	0.4	0.3	0.9
Chronic Illness Risk Score (>1)	14,556	24%	7,584	32%	898	31%	6,686	32%	6,972	18%	142	15%	6,830	19%
Chronic Illness Risk Score*	0.8	1.0	1.0	1.1	1.0	1.2	1.0	1.1	0.6	0.9	0.5	0.7	0.7	0.9

	All Jail Bookings		Prior OUD Diagnosis				No Prior OUD Diagnosis							
			No MOUD Initiation				No MOUD Initiation							
			MOUD Initiation				MOUD Initiation							
	N	%	TOTAL N	%	N	%	N	%	TOTAL N	%	N	%		
Homeless or Unstably Housed	41,637	68%	18,552	79%	2,306	79%	16,246	79%	23,085	61%	721	74%	22,364	61%
Criminal Legal Factors														
Benton County Jail	12,238	20%	3,947	17%	1,267	43%	2,680	13%	8,291	22%	507	52%	7,784	21%
Franklin County Jail	5,343	9%	1,446	6%	518	18%	928	4%	3,897	10%	165	17%	3,732	10%
Jefferson County Jail	1,205	2%	597	3%	95	3%	502	2%	608	2%	17	2%	591	2%
Kitsap County Jail	10,369	17%	3,867	16%	376	13%	3,491	17%	6,502	17%	122	13%	6,380	17%
South Correctional Entity	32,211	52%	13,731	58%	669	23%	13,062	63%	18,480	49%	163	17%	18,317	50%
Days to MOUD Treatment Initiation in a Jail-based OTN*	11.1	18.7	11.1	18.2	11.1	18.2	-	-	11.1	20.1	11.1	20.1	-	-
Prior Arrests*	3.5	3.8	4.3	4.0	4.1	3.5	4.3	4.1	3.0	3.5	3.9	3.5	2.9	3.5
Detained in Jail or Prison (prior 3 months)	24,774	40%	11,031	47%	1,466	50%	9,565	46%	13,743	36%	524	54%	13,219	36%
Detained in Jail or Prison (prior 12 months)	42,962	70%	18,787	80%	2,546	87%	16,241	79%	24,175	64%	822	84%	23,353	63%
Length of Jail Stay < 3 days	20,485	33%	6,606	28%	91	3%	6,515	32%	13,879	37%	28	3%	13,851	38%
Length of Jail Stay 3 to 5 days	11,574	19%	4,133	18%	231	8%	3,902	19%	7,441	20%	87	9%	7,354	20%
Length of Jail Stay 6 to 16 days	14,717	24%	6,500	28%	968	33%	5,532	27%	8,217	22%	294	30%	7,923	22%
Length of Jail Stay > 16 days	14,590	24%	6,349	27%	1,635	56%	4,714	23%	8,241	22%	565	58%	7,676	21%
Length of Jail Stay*	13.3	23.8	14.1	22.6	28.8	34.2	12.0	19.6	12.8	24.5	32.3	41.0	12.2	23.7
Felony Arrest	28,746	47%	13,550	57%	1,790	61%	11,760	57%	15,196	40%	577	59%	14,619	40%

NOTE: Items with an asterisk (*) display mean and standard deviation. The data described above are based on events where the individual had Medicaid coverage in the 24 months prior to their booking event for at least 6 months (Title XIX Medicaid excluding dual Medicare coverage) and were between 18 and 64 years of age at the time of booking (refer to Figure A1 for more information). All measures reflect the 24 months prior to booking unless noted otherwise. See Technical Notes for a description of measures and their associated units. Items shown as <11 are suppressed per data suppression guidelines to protect the privacy of individuals.

EVALUATION FUNDING

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STUDY POPULATION

This evaluation includes 18- to 64-year-olds that were booked into at least one of five jail-based OTNs and who were enrolled in Title XIX Medicaid coverage (excluding dual Medicare coverage) for at least 6 months in the 24 months prior to their booking event. Medicaid beneficiaries with non-Medicaid primary health care coverage, also referred to as third-party liability, were excluded from the analyses as complete health care information may not be available for these individuals. Analyses were further restricted to jail booking events that occurred at jails receiving SOR funds, complete demographic information, and length of jail stays less than or equal to 365 days (N = 61,366).

The analytic sample was separated into two cohorts for analysis: events where the individual had a prior OUD diagnosis as evidenced in Medicaid claims 24 months prior to their booking event, and events where the individual did not have a prior OUD diagnosis. A definition of an OUD diagnosis is as follows:

- **Opioid Use Disorder Diagnosis** is defined as the presence of an OUD diagnosis in the 24 months prior to the booking event as identified in Medicaid claims data from ProviderOne. Diagnoses were based on the International Classification of Disease version 10 (ICD-10) medical codes indicating an OUD (e.g., F11 codes).
- **No Prior Opioid Use Disorder Diagnosis** is defined as the absence of an OUD diagnosis in Medicaid claims data in the 24 months prior to the booking event.

DATA SOURCES

Between January 2019 and September 2022, the SOR OTNs provided monthly participant data to the DSHS RDA research team. These records contained patient identifiers, demographics, and relevant treatment details including dates of service and the type of MOUD received at initiation.

The DSHS Integrated Client Databases (ICDB) were leveraged to identify all jail bookings in Washington State during the same period. These data were originally sourced from the Jail Booking and Reporting System (JBRS) and ProviderOne (Medicaid). The study population was specifically limited to individuals who were both booked and released within the specified date parameters. The booking month was used as the index for each event. Using additional information within the ICDB, healthcare and social service descriptive profiles covering the 24 months preceding the index month were curated for individuals represented by the jail-booking events.

This evaluation was an event-based analysis, meaning an individual with more than one booking in the jail-based OTNs is represented in the dataset multiple times. This comprehensive approach provides a snapshot of all individuals booked in these five Washington State jails during the study period and the ability of the jail-based OTN to identify individuals that may benefit from MOUD treatment services.

STUDY MEASURES

In this report various behavioral health, healthcare and social services, and criminal legal factors are used to describe the study population and to predict initiation of MOUD treatment in the jail-based OTNs. Health-related factors rely on ICD-10 medical codes and pharmaceutical claims contained within Medicaid claims data. Social and criminal legal factors rely on other administrative data systems included in the ICDB.

Behavioral Health Measures

- **Mental Health (MH) Diagnoses** are defined as the presence of a MH diagnosis in the 24 months prior to the booking event. Example diagnoses include Attention Deficit Hyperactivity, Anxiety, Depression, and Mania Bipolar. Sub-components of this broader definition were used where indicated (e.g., depression).

- **MH Treatment** is defined as the presence of MH treatment service claims that occurred in any inpatient psychiatric services including state hospital and community psychiatry, or any outpatient non-crisis services. MH treatment measures were assessed individually as inpatient and outpatient.
- **Substance Use Disorder (SUD) Diagnoses** are defined as the presence of a SUD diagnosis in the 24 months prior to the booking event. Example SUD diagnoses include diagnoses related to alcohol, stimulants, and opioids. Sub-components of this broader definition were used where indicated (e.g., OUD).
- **SUD Treatment** is defined as the presence of alcohol or other substance use treatment claims including outpatient, inpatient, MOUD, and medications for alcohol use disorder.
- **Medically Managed Withdrawal** is defined as any medical claim indicating receipt of SUD medically managed withdrawal services.
- **MOUD Treatment** is defined as any pharmacy claims or medical claims codes for buprenorphine, methadone, or naltrexone. MOUD treatment was assessed in the 3- and 24-months prior to the booking event. Sub-components of this broader definition were used where indicated (e.g., buprenorphine treatment).

Healthcare And Social Services

- **Medicaid Enrollment** is defined as adult (ages 18 – 64) individuals enrolled in Title XIX Medicaid and that had coverage for at least six of the 24 months prior to the jail booking event.
- **Basic Food Assistance** is defined as administrative record claims indicating receipt of the Supplemental Nutrition Assistance Program (SNAP), or Basic Food receipt.
- **Emergency Department (ED) Utilization** is defined as any medical claim code indicating an outpatient ED visit, meaning the visit did not result in a transfer to a general medical inpatient hospitalization, in the 24 months prior to the jail booking event.
- **ED Utilization Rate** is calculated by summing the number of ED outpatient visits divided by total number of months with Medicaid coverage among the population of focus, multiplied by 1,000. This creates a rate of ED usage per 1,000 months of Medicaid coverage.
- **Employment** is defined as the number of quarters of employment in the eight calendar quarters prior to the jail booking event. Employment data is reported quarterly and so eight quarters were used to create a similar timeframe to the 24-month lookback period.
- **Hospitalization** is defined as any medical claim code indicating an inpatient hospitalization, whether presented in the ED initially or not, in the 24 months prior to the jail booking event.
- **Hospitalization Rate** is calculated by summing the number of inpatient hospitalizations divided by total number of months with Medicaid coverage among the population of focus, multiplied by 1,000. This creates a rate of hospitalizations per 1,000 months of Medicaid coverage.
- **Chronic Illness Risk Score** is an indicator developed to identify individuals with significant health problems. A risk score equal to one is the score for the average Medicaid participant in Washington State meeting Supplemental Security Income disability criteria. Chronic illness risk scores were derived from health diagnoses and pharmacy claims, using a predictive model linking conditions to future medical costs (Kronick et al., 2000; Gilmer et al., 2001). A chronic illness is identified if a risk score was greater than one.
- **Homeless or Unstably Housed** is defined as administrative records signaling homelessness or unstable housing from a variety of administrative data systems in any month in the 24 months before the jail booking event.

Criminal Legal Factors

Criminal legal factors were evaluated in the 24 months prior to the booking event (unless noted otherwise).

- **Days to MOUD Treatment Initiation in a Jail-based OTN** is defined as the number of days from the jail booking date to the receipt of MOUD treatment while in a jail-based OTN. MOUD receipt was reported by the jails to meet the SOR reporting and reimbursement requirements.
- **Prior Arrests** is defined as the number of arrests in the 12 months prior to the jail booking event based on Washington State Patrol records.
- **Detained in Jail or Prison** is defined as an individual detained in a jail prison facility in the 3- or 12-months prior to the jail booking event based on JBRS booking and release dates.

- **Length of Jail Stay** is defined as the number of days in jail based on JBRS booking and release dates. Length of Jail Stay was split into four groups: less than 3 days; 3 to 5 days; 6 to 16 days; and more than 16 days.
- **Felony Arrest** is defined as the presence of an arrest for a felony in the 24 months prior to the jail booking event based on Washington State Patrol records.

RACE AND ETHNICITY CONSIDERATIONS

Race and ethnicity indicators are compiled from multiple data sources in the ICDB. As data source information updates or changes, individual race or ethnic identifications are updated in the administrative databases. Table A4 provides a description of the race and ethnicity categories used in the logistic regression for this evaluation.

TABLE A4.

Race and Ethnicity Categorization Methods for Logistic Regression

Race and Ethnicity Category	Description
AIAN non-Hispanic	American Indian or Alaska Native (AIAN) only.
AIAN Multiracial	AIAN with combinations of Black or African American, Hispanic or Latino, Native Hawaiian or Pacific Islander (NHPI), or Asian. Excludes White.
AIAN White	AIAN and White. May include combinations of Black or African American, Hispanic or Latino, NHPI, or Asian.
Black or African American non-Hispanic	Black or African American only.
Black or African American Multiracial	Black or African American with combinations of Hispanic or Latino, NHPI, or Asian. Excludes White.
Black or African American White	Black or African American and White. May include combinations of Hispanic or Latino, NHPI, or Asian.
Hispanic or Latino Multiracial	Hispanic or Latino only or with combinations of NHPI, Asian, or White. Excludes AIAN and Black or African American.
NHPI non-Hispanic	NHPI only or with combinations of Asian or White. Excludes AIAN, Black or African American, and Hispanic or Latino.
Asian non-Hispanic	Asian only or in combination with White.
White non-Hispanic	White only and not Hispanic or Latino.

MULTIVARIATE LOGISTIC REGRESSION

All analyses were conducted using SAS 9.4® (SAS Institute Inc., 2019). Researchers employed the *genmod* procedure to estimate the logistic regression model, accounting for dependence among repeated measurements (i.e., individuals with multiple booking events between January 2019 and September 2022) (Allison, 2012, pp. 222-226). The results are reported as adjusted odds ratios with 95% confidence limits for the estimated coefficients. Statistical significance was determined using a standard alpha level of 0.05.

Covariates included age, gender, race and ethnicity, mental health and substance use diagnoses and treatments, prior MOUD treatment, homelessness or unstable housing, jail facility, and jail or prison incarceration. These covariates were operationalized as binary variables. Additionally, arrest counts were included as continuous measures for each jail booking event. To account for the large variance in the length of jail stay measure, RDA researchers created four dichotomous variables (also known as 'dummy variables') by segmenting the measure into its 25th, 50th, and 75th percentiles.

The following reference groups were chosen for the multivariate logistic regression model: young adults (18- to 25-year-olds), White non-Hispanic, Kitsap County Jail, and length of jail stays less than 3 days. The 18- to 25-year-olds were chosen as the reference group because it is the lowest quantity group among the age categories. Kitsap County Jail was selected as the reference group to ensure that the presented coefficients are positively signed. The group with a length of jail stay less than 3 days was selected as the reference group because the other categories unfold from it. While there is no universally accepted standard for selecting a reference group based on race and ethnicity, the decision to use the White non-Hispanic category was influenced by its representation as the majority race in the analytic sample. This choice provides relevant context for examining potential disparities in other racial groups initiating MOUD treatment (Johfre and Freese, 2021).

REFERENCES

- Allison, P. D., (2012). *Logistic Regression Using SAS®: Theory and Application*, Second Edition. Cary, NC: SAS Institute Inc.
- American Civil Liberties Union. (2021). Over-jailed and un-treated: How the failure to provide treatment for substance use in prisons and jails fuels the overdose epidemic. Available at: <https://www.aclu.org/publications/report-over-jailed-and-un-treated>
- Barnett, M. L., Meara, E., Lewinson, T., Hardy, B., Chyn, D., Onsando, M., ... & Morden, N. E. (2023). Racial inequality in receipt of medications for opioid use disorder. *New England Journal of Medicine*, 388(19), 1779-1789.
- Binswanger, I. A., Blatchford, P. J., Mueller, S. R., & Stern, M. F. (2013). Mortality after prison release: opioid overdose and other causes of death, risk factors, and time trends from 1999 to 2009. *Annals of internal medicine*, 159(9), 592-600.
- Brezel, E. R., Powell, T., & Fox, A. D. (2020). An ethical analysis of medication treatment for opioid use disorder (MOUD) for persons who are incarcerated. *Substance Abuse*, 41(2), 150–154. <https://doi.org/10.1080/08897077.2019.1695706>.
- Bronson, J., Stroop, J., Zimmer, S., & Berzofsky, M. (2017). *Drug use, dependence, and abuse among state prisoners and jail inmates, 2007–2009*. Washington, DC: United States Department of Justice, Office of Juvenile Justice and Delinquency Prevention.
- Clarke, J. G., Martin, R. A., Gresko, S. A., & Rich, J. D. (2018). The first comprehensive program for opioid use disorder in a US statewide correctional system. *American Journal of Public Health*, 108(10), 1323-1325.
- Department of Justice. (2023). Guidelines for managing substance withdrawal in jails. Available at: <https://bjaojp.gov/library/publications/guidelines-managing-substance-withdrawal-jails>
- Duncan, D. F., Nicholson, T., White, J. B., & Ellis-Griffith, G. (2014). A brief history of prohibition and treatment solutions for substance abusers. *International Journal of Criminology and Sociology*, 3, 186.
- Dunphy, C. C., Zhang, K., Xu, L., & Guy Jr, G. P. (2022). Racial–ethnic disparities of buprenorphine and vivitrol receipt in Medicaid. *American journal of preventive medicine*, 63(5), 717-725.
- Fazel, S., Bains, P., & Doll, H. (2006). Substance abuse and dependence in prisoners: a systematic review. *Addiction*, 101(2), 181-191.
- Gilmer, T., Kronick, R., Fishman, P., & Ganiats, T. G. (2001). The Medicaid Rx model: pharmacy-based risk adjustment for public programs. *Medical care*, 39(11), 1188-1202.
- Grande, L., Stern, M., (2018). Providing Medication to Treat Opioid Use Disorder in Washington State Jails. Available at: <https://faculty.washington.edu/mfstern/WAJailOpiateResponse.pdf>
- Green, T. C., Clarke, J., Brinkley-Rubinstein, L., Marshall, B. D., Alexander-Scott, N., Boss, R., & Rich, J. D. (2018). Postincarceration fatal overdoses after implementing medications for addiction treatment in a statewide correctional system. *JAMA psychiatry*, 75(4), 405-407.
- Greenland, S. (1989). Modeling and variable selection in epidemiologic analysis. *American journal of public health*, 79(3), 340-349.
- Hartung, D. M., McCracken, C. M., Nguyen, T., Kempny, K., & Waddell, E. N. (2023). Fatal and nonfatal opioid overdose risk following release from prison: A retrospective cohort study using linked administrative data. *Journal of substance use and addiction treatment*, 147, 208971.
- Hollander, M. A., Chang, C. C. H., Douaihy, A. B., Hulsey, E., & Donohue, J. M. (2021). Racial inequity in medication treatment for opioid use disorder: Exploring potential facilitators and barriers to use. *Drug and alcohol dependence*, 227, 108927.
- James, K., & Jordan, A. (2018). The opioid crisis in black communities. *The Journal of Law, Medicine & Ethics*, 46(2), 404-421.
- Johfre, S. S., & Freese, J. (2021). Reconsidering the reference category. *Sociological Methodology*, 51(2), 253-269.
- Joudrey, P. J., Khan, M. R., Wang, E. A., Scheidell, J. D., Edelman, E. J., McInnes, D. K., & Fox, A. D. (2019). A conceptual model for understanding post-release opioid-related overdose risk. *Addiction science & clinical practice*, 14, 1-14.
- Kronick, R., Gilmer, T., Dreyfus, T., & Lee, L. (2000). Improving health-based payment for Medicaid beneficiaries: CDPS. *Health care financing review*, 21(3), 29.
- Lagisetty, P. A., Ross, R., Bohnert, A., Clay, M., & Maust, D. T. (2019). Buprenorphine treatment divide by race/ethnicity and payment. *JAMA psychiatry*, 76(9), 979-981.
- Mancher, M., & Leshner, A. I. (Eds.). (2019). *Medications for opioid use disorder save lives*. National Academies Press.

Martin, R. A., Alexander-Scott, N., Berk, J., Carpenter, R. W., Kang, A., Hoadley, A., ... & Clarke, J. G. (2023). Post-incarceration outcomes of a comprehensive statewide correctional MOUD program: a retrospective cohort study. *The Lancet Regional Health–Americas*, 18.

McHugh, M. L. (2009). The odds ratio: calculation, usage, and interpretation. *Biochemia medica*, 19(2), 120-126.

Moore, K. E., Roberts, W., Reid, H. H., Smith, K. M., Oberleitner, L. M., & McKee, S. A. (2019). Effectiveness of medication assisted treatment for opioid use in prison and jail settings: A meta-analysis and systematic review. *Journal of substance abuse treatment*, 99, 32-43.

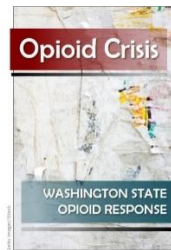
Mumola, C. J., & Karberg, J. C. (2007). *Drug use and dependence, state and federal prisoners, 2004*. Washington, DC: US Department of Justice, Office of Justice Programs, Bureau of Justice Statistics.

Provine, D. M. (2011). Race and inequality in the war on drugs. *Annual Review of Law and Social Science*, 7, 41-60.

Scott, C. K., Grella, C. E., Dennis, M. L., Carnevale, J., & LaVallee, R. (2022). Availability of best practices for opioid use disorder in jails and related training and resource needs: findings from a national interview study of jails in heavily impacted counties in the US. *Health & Justice*, 10(1), 36.

Volkow, N. D. (2021). Addiction should be treated, not penalized. *Neuropsychopharmacology*, 46(12), 2048-2050.

Wakeman, S. E., Larochelle, M. R., Ameli, O., Chaisson, C. E., McPheeters, J. T., Crown, W. H., ... & Sanghavi, D. M. (2020). Comparative effectiveness of different treatment pathways for opioid use disorder. *JAMA network open*, 3(2), e1920622-e1920622.



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