



State level variation in substance use treatment admissions among criminal legal-referred individuals

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ABSTRACT

Background: Individuals involved in the criminal legal system face unique challenges to accessing substance use disorder (SUD) treatment, yet state-level variation in referrals for treatment remains largely unknown. To address disparities in the overdose crisis among individuals with criminal legal involvement, it is important to understand variation in SUD treatment across states.

Methods: We conducted a retrospective comparison of substance use treatment referrals from the criminal legal system and other sources across participating states. Using data from the 2018–2019 Treatment Episode Dataset-Admissions, we characterized treatment referral rates from the criminal legal system, the substances most commonly leading to treatment, and rates of treatment with medication for opioid use disorder (MOUD) across states.

Results: Across all states, criminal legal referral rates were higher than non-criminal legal rates. Criminal-legal referral rates, adjusted for state overdose deaths, were highest in the Northeast and Midwest. Methamphetamine use was the most common substance leading to treatment referral from the criminal legal system in 24 states while opioid use was the most common reason for non-criminal legal referrals in 34 states. In over half the states analyzed, fewer than 10% of opioid treatment referrals from the criminal legal system received MOUD. In almost all states, MOUD was more common in treatment referred from non-criminal legal settings.

Conclusion: State-specific policies and practices shape drug policy and the SUD treatment landscape for people with criminal legal involvement. Standards and ongoing monitoring for substance use treatment referrals from the criminal-legal system should be considered by federal agencies charged with addressing the ongoing overdose crisis.

1. Introduction

Across the US, individuals involved in the criminal legal system face many unique challenges to treatment access and retention. Persons who are involved in the criminal legal system are estimated to have over ten times the rate of substance use disorder (SUD) than the general population (Bronson and Stroop, 2017). Despite some opportunities for linkages between corrections and community care, continuity of care for patients transitioning between the community and carceral settings is disrupted in multiple ways (Jennings et al., 2021), leading to high rates of post-release mortality (Binswanger et al., 2013; Krawczyk et al., 2020;

Pizzicato et al., 2018; Ranapurwala et al., 2018). For patients with opioid use disorder (OUD) specifically, rates of evidence-based treatment with medications for OUD (MOUD) are consistently lower for criminal legal-involved populations compared to the general population (Khatri et al., 2021; Krawczyk et al., 2017; Winkelman et al., 2020).

SUD prevalence, treatment rates, and SUD-related morbidity and mortality vary substantially within the United States (Fingar et al., 2018; Goedel et al., 2020; Han et al., 2011; Vital signs, 2011; Rossen et al., 2013; Gleit and Preston, 2020). Previous studies using national data have found state and county level variation in per capita rates of SUD-related inpatient admissions as well as variation in the substances leading to

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admission (Dwyer-Lindgren et al., 2018). While penalization for SUD is common throughout the United States, geographic variation exists in this practice as well. Results from a national survey show that individuals with a history of criminal legal involvement are most likely to receive a majority of their substance use treatment at detoxification or outpatient/rehabilitation facilities (Tsai and Gu, 2019). Furthermore, as the vast majority are eligible for public insurance through Medicaid, understanding treatment patterns at treatment facilities that receive public funding is critical to develop policies to improve treatment and reduce drug-related harm among individuals with criminal legal system involvement (Howard et al., 2016).

To our knowledge, state-level variation in referrals to substance use treatment facilities among the criminal legal-involved population remains largely unknown. Policy priorities, substance use treatment capacity, and resource allocation for public health crises are frequently developed at the state level. In order to address disparities in the overdose crisis among individuals with criminal legal involvement, it is important to understand variation in SUD treatment across states. In this paper, we seek to describe state-level rates of treatment admission, common substances leading to treatment admission, and rates of MOUD at substance use treatment facilities, among individuals referred to treatment by the criminal-legal system. A secondary aim was to compare these estimates to the general population to provide additional contextualization.

2. Methods

We conducted a retrospective comparison of substance use treatment admissions referred from the criminal legal system and other sources (hereinafter referred to as “non-criminal legal referrals”) across states.

2.1. Data sources

We used 2018 and 2019 data from the Treatment Episode Data Set-Discharges (TEDS-A), a survey of all publicly funded treatment episodes conducted by the Substance Abuse and Mental Health Services Administration (SAMHSA) (TEDS, 2021). Substance use treatment facilities that receive public funding are required to report data to the state they operate in, and states then report these data to SAMHSA. Some states report all treatment admissions from facilities that accept public funds, whereas others only report admissions that were financed with public dollars. TEDS-A includes patient sociodemographic information, referral source, and information about the primary, secondary, and tertiary substances that led to treatment.

We used an average of the 2018 and 2019 community supervision populations (defined as individuals on probation or parole), estimated by the Bureau of Justice Statistics, (Maruschak, 2020) and U.S. Census Bureau estimates of the U.S. resident population of persons age 18 or older to create state-level denominators for criminal legal and general populations, respectively.

2.2. Study sample

We included all treatment episodes from 2018 and 2019 for adults aged eighteen and older. We compared treatment episodes by referral source defined as the agency or individual referring an individual to treatment. We categorized treatment episodes into two groups based on referral source: criminal legal and non-criminal legal referrals. Treatment episodes from criminal legal referrals (hereinafter referred to as “criminal legal referrals”) were from a police official, judge, prosecutor, probation officer and included treatment episodes for individuals on pre-parole, pre-release, or parole. Treatment episodes from non-criminal legal referrals (hereinafter referred to as “non-criminal legal referrals”) included self-referrals and those from family or friends, alcohol or drug use care providers, healthcare providers, employers, community organizations, or public agencies. Oregon and Washington did not report

substance use treatment data in 2018 and/or 2019 and were excluded from the analysis.

2.3. Sociodemographic characteristics

We examined age, sex, race, ethnicity, employment status, education, and census region among people with and without criminal legal referral. Employment included both full and part-time employed individuals.

2.4. Outcomes and analysis

We first examined sociodemographic characteristics among criminal legal referrals and then compared them to non-criminal legal referrals using Pearson Chi-square tests. Next, we calculated substance use treatment admission rates among criminal-legal referrals and non-criminal legal referrals, by state. To account for geographic variation in the state-level severity of the substance use crisis, we adjusted rates using 2018 and 2019 state overdose death rates (Centers for Disease Control and Prevention. CDC WONDER, 2020; Langabeer et al., 2019). Because treatment recommendations do not vary by age, gender, or race we did not adjust for individual level sociodemographic factors. To first assess access to treatment, we visually compared the geographic distribution of the states with the highest and lowest admission rates between referral sources.

To examine state-level variation in the character of substance use treatment among criminal legal-referrals, we determined the most common primary substance leading to treatment in each state. We defined OUD treatment admissions as those for heroin, non-prescription methadone, and other opioids. Because alcohol is not criminalized for use or possession alone and may require different treatment resources than other substances, we also determined the most common substance leading to treatment admission across states excluding treatment referrals for alcohol. We then visually compared the geographic distribution of the most common primary substance leading to treatment admissions from criminal legal and non-criminal legal referrals. We also tabulated the number of states with opioids, methamphetamine, and marijuana as the most common substance leading to treatment admission.

Given the importance of MOUD, high rates of OUD among criminal legal-involved individuals, and elevated risk of mortality post-incarceration, we compared rates of MOUD during OUD treatment across states between criminal legal and non-criminal legal referrals (Binswanger et al., 2013)(Ranapurwala et al., 2018). Among treatment admissions indicating heroin, non-prescription methadone, or other opiates as the primary substance we calculated the proportion that included MOUD in the treatment plan and used 2-sample proportion tests to determine whether differences were statistically significant. Consistent with previous work, we excluded states that reported data on MOUD use in fewer than 75% of treatment admissions in one or more years (Maclean and Saloner, 2019; Tormohlen et al., 2020). All data were de-identified and publicly available and thus this study did not require Institutional Review Board approval.

3. Results

Using 2018 and 2019 data, we identified a total of 901,040 and 2,502,889 criminal legal and non-criminal legal substance use treatment referrals, respectively. Referrals from the criminal legal system were more common among males (71.9 %) than females (28.1 %) and unemployed (58.9 %) than employed (37.8 %) individuals. Criminal legal system referrals were most common in states in the Midwest (28.3 %). Compared to non-criminal legal referrals, referrals from the criminal legal system were more likely to be aged 18–24 (16.5 % vs. 9.4%), have less than a high school education (25.2 vs. 22.4 %) and were less common among non-Hispanic White individuals (56.5 % vs. 60.3 %).

Table 1

Sociodemographic characteristics of criminal legal and non-criminal legal referrals to substance use treatment, 2018–2019.

Sociodemographic Variables	Criminal Legal Referral Source n = 901,040	Non-Criminal Legal Referral Source n = 2,502,889	Statistical Difference
Age (years)			$P \leq 0.001$
18–24	16.5 %	9.4 %	
25–39	52.3 %	48.8 %	
40–54	23.6 %	29.0 %	
55 +	7.6 %	12.8 %	
Sex			$P \leq 0.001$
Male	71.9 %	62.1 %	
Female	28.1 %	37.9 %	
Race and Ethnicity			$P \leq 0.001$
Non-Hispanic White	56.5 %	60.3 %	
Non-Hispanic Black	19.0 %	18.3 %	
Non-Hispanic Indigenous ^a	3.4 %	2.1 %	
Hispanic	15.4 %	12.8 %	
Other ^b	3.3 %	3.1 %	
Missing	2.5 %	3.4 %	
Employment Status			$P \leq 0.001$
Employed	37.8 %	20.4 %	
Unemployed	58.9 %	73.2 %	
Missing	3.3 %	6.4 %	
Education			$P \leq 0.001$
Less than High School	25.2 %	22.4 %	
High School Completed	49.7 %	45.4 %	
Some College or more	21.5 %	25.3 %	
Missing	3.7 %	6.9 %	
Census Region			$P \leq 0.001$
Northeast	27.5 %	34.7 %	
Midwest	28.3 %	18.7 %	
South	24.8 %	28.2 %	
West	19.4 %	18.4 %	

Notes: Criminal Legal includes referral from police, probation officers, judges, prosecutors, DUI/DWI court, or parole board.

^a Includes Alaska Native, American Indian, and Native Hawaiian or Other Pacific Islander.

^b Includes Asian or Pacific Islander, Asian, other single race, two or more races

(Table 1).

3.1. Adjusted referral rates

To explore state-level variation, we calculated referral rates adjusted for the severity of the substance use crisis in each state. Across all states, criminal legal referral rates were higher than non-criminal legal rates.

For both referral sources, rates were generally the highest in the Northeast (ME, NH, VT, MA, RI, CT, NY, PA, and NJ) and The West North Central Region of the Midwest (ND, SD, NE, KS, MN, IA, and MO). However, there was within region variation of the relative rates between criminal legal referral rates. For example, in the Northeast, New York and Vermont were in the highest quartile while Pennsylvania was in the lowest quartile of referral rates. No states in the South were among the top quartile, but six states (TX, LA, GA, FL, KY, and WV) were in the bottom quartile of criminal-legal referral rates (Fig. 1).

3.2. Substances leading to admission

Alcohol was the most common substance leading to treatment referrals from the criminal legal system in 25 states (see [appendix](#) for additional details.) When alcohol was excluded, methamphetamine was the most common reason for treatment referral from the criminal legal system in 24 states, predominately in the western half of the country. Opioids were the most common reason for treatment referral in 15 states, predominately located in the Northeast, and in 9 states marijuana was the most common reason for treatment referral from the criminal legal system (Fig. 2). Conversely, in only one state (GA) was marijuana the most common reason for non-criminal legal referral, excluding alcohol. Opioids were the most common reason for non-criminal legal treatment referrals in 34 states, excluding alcohol (see [appendix](#) for additional details).

3.3. Receipt of MOUD

We observed significant variation in the rate of MOUD use at specialty treatment facilities between states (Fig. 3). In over half of the states analyzed, fewer than 10 % of opioid treatment referrals from the criminal legal system received MOUD. But over in over half the states, representing all four census regions, treatment facilities used MOUD in at least a 25 % of OUD treatment episodes among non-criminal legal referrals. In almost all states, at specialty treatment facilities MOUD was more common among referrals from non-criminal legal settings than criminal legal referrals. The states with the highest rate of MOUD use in treatment episodes referred from the criminal legal system (32.2–53.6 %) were all in the Northeast (Vermont, New York, Maine, and Massachusetts). The largest disparity was in California treatment facilities where 66.9 % of treatment episodes for opioid use referred from outside of the criminal legal system included MOUD compared to only 3.2 % of the criminal legal system referrals. Notably, treatment facilities in New York and Massachusetts had a higher treatment rate with MOUD among criminal legal referrals (47.9 % and 32.2 %) compared to non-criminal

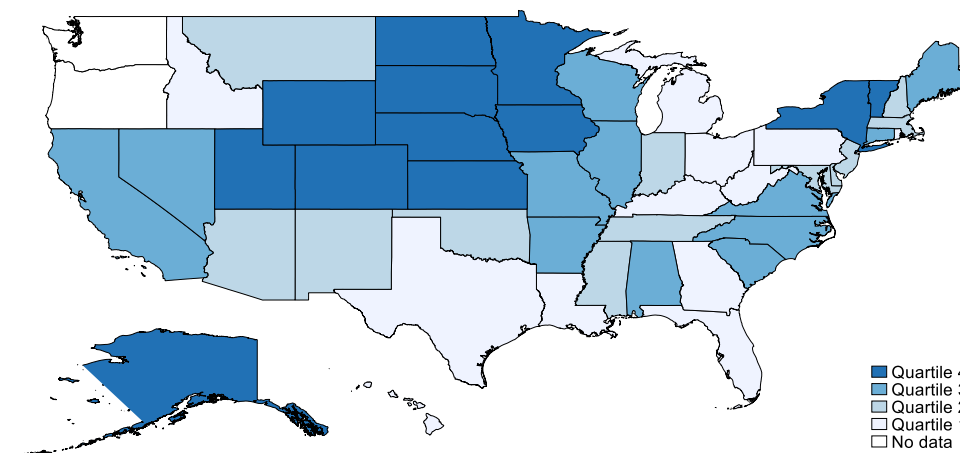


Fig. 1. Quartile of criminal legal referral rate, by state, 2018–2019, Note: Adjusted for state-level overdose death rates, quartile 4 are the 25 % of states with the highest death rate.

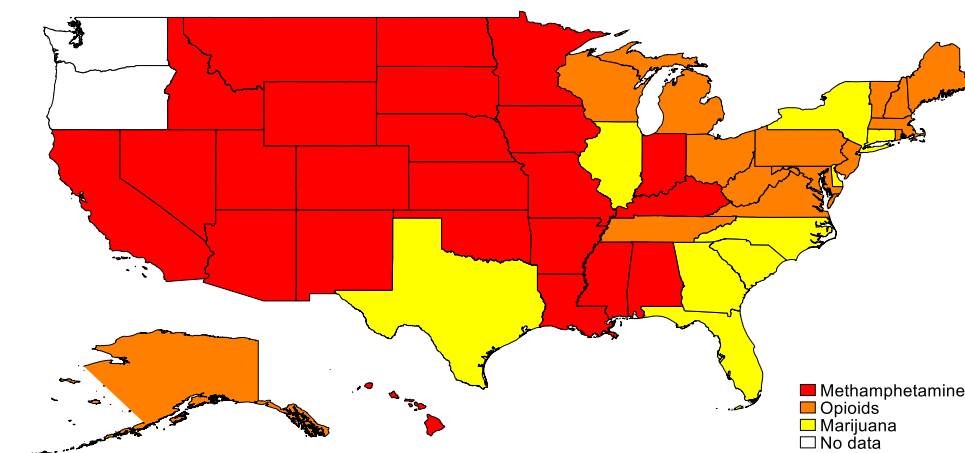


Fig. 2. Most common primary substance leading to criminal legal referral, by state, **2018–2019**. Note: In states where Alcohol was the most common substance leading to treatment referral, we report the second most common substance leading to treatment referral.

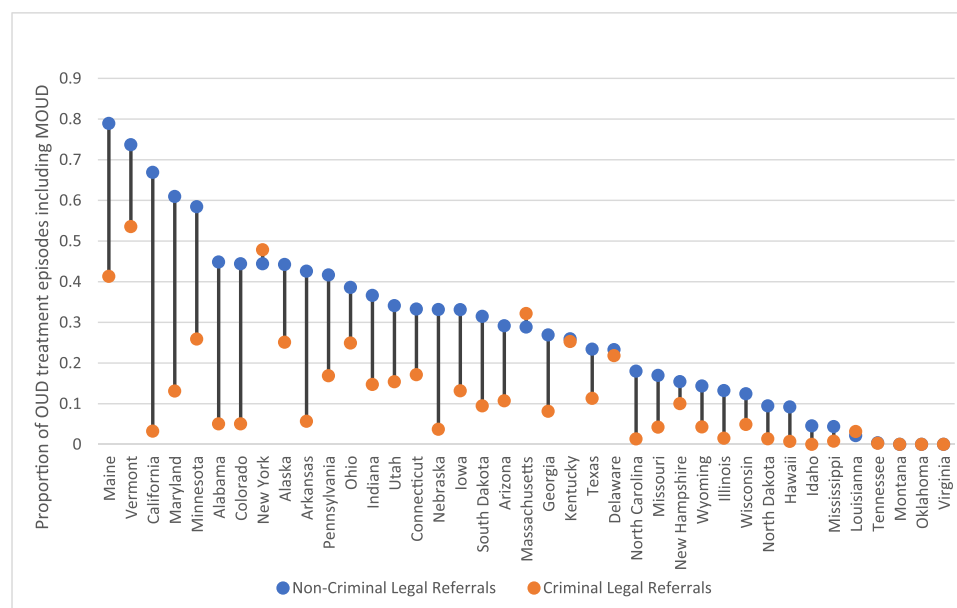


Fig. 3. Proportion of opioid use disorder treatment admissions which include medication for opioid use disorder, by state and referral source, 2018–2019. Notes: For all states the proportion of OUD related admissions receiving MOUD were statistically different between criminal legal and non-criminal legal referrals at the $p \leq 0.001$ level unless otherwise noted. States with non-statistically differences included: Kentucky $p = 0.429$, Delaware $p = 0.290$, Idaho $p = 0.003$, Louisiana $p = 0.168$, and Tennessee 0.183.¹¹

legal referrals (44.4 % and 28.9 %).

4. Discussion

In this national comparison of admissions to substance use treatment facilities among criminal legal-involved populations, we described widespread state-level variability in treatment admission rates, primary substances leading to admission, and rates of MOUD. In most states, alcohol was the most common substance leading to treatment admission from the criminal legal system. When excluding alcohol, methamphetamine was the most common substance leading to treatment for criminal legal referrals. In contrast, the most common substance leading to treatment for non-criminal legal referrals was opioids. There was considerable geographic variability within both groups. Finally, we found that when compared with the non-criminal legal referrals, criminal legal-referred treatment episodes were less likely to use MOUD for primary opioid related treatment admissions in all but 3 states.

While there is a growing body of literature focused on examining SUD treatment among individuals who are incarcerated, few studies have examined variability in treatment rates among criminal legal-involved individuals in the community. To our knowledge, this study

is the first state-level analysis comparing admissions at substance use treatment facilities for this population while accounting for state-level burden of the overdose crisis. Our approach allows us to develop a more granular understanding the substance use treatment rates by geography and legal-involvement. For example, our results showed that when excluding alcohol, marijuana is the most common substance leading to treatment referral from the criminal legal system in nine states. In contrast, among non-criminal legal referrals marijuana is the most common substance leading to treatment referral in only one state. This variation is more likely to reflect local policies of drug enforcement and sentencing, including parole and probation stipulations of complete abstinence, than differences in marijuana use patterns between the two populations (Boman et al., 2019).

Interestingly, we also found cocaine is not the primary substance leading to treatment for most admissions. The prevalence of cocaine use has increased modestly over the last two decades and cocaine-involved overdose mortality has risen dramatically across the country (Cano et al., 2020). Furthermore, cocaine is the most commonly used substance among individuals in some state prisons the primary drug used by the majority individuals in federal prison for a drug offense, though this has not been found to be true among individuals on probation in the

community (Olson et al., 2021; Taxy, 2015; Bronson and Stroop, 2017). Given high rates of cocaine-related morbidity and mortality among criminal legal-involved people, further investigation to ensure there is not a treatment gap for cocaine use disorder is warranted.

Despite the proven effectiveness of MOUD, it remains largely inaccessible, especially among individuals involved with the criminal legal system (Moore et al., 2019; Krawczyk et al., 2017). Our results show significant variation across states in receipt of MOUD, with disparities by legal involvement. Even in states like Maine, Vermont, California, Maryland, and Minnesota, where the majority of non-criminal legal referred admissions for OUD received MOUD, the rates of MOUD receipt among legal-referred adults are dramatically lower at substance use treatment facilities. This geographic approach identified state-level patterns, which may explain some disparities in MOUD treatment. Rates of MOUD treatment were generally higher among states where opioids were the most common reason for referral from the criminal legal system. Among the 10 states with the highest rate of MOUD for criminal-legal referrals, opioids were the leading cause of treatment referral in 60% of these states, despite opioids being the leading cause in only 31% of states overall.

State-level disparities in MOUD treatment rates highlight the need to further explore the impacts of local policies, treatment availability, and acceptance within criminal legal agencies. For example, California, had the largest disparity in MOUD between criminal legal referrals and the general population, but it is unclear why the rates of evidence-based treatment with MOUD are so much lower for the legal-involved population than the general population. States in which we found MOUD treatment parity between legal-referred individuals and the general population, such as in New York, Kentucky, and Massachusetts, could serve as case studies on how to narrow the gap in MOUD receipt. For example, the Kentucky Department of Corrections Supportive Assistance with Medication for Addiction Treatment program, available in 14 state institutions and 20 county jails in the state, is a robust program that has received national recognition (Shelly Weizman and Melissa Baney, 2021). In Massachusetts, the passage of Chapter 208 in 2018, made it the first state to mandate that five county jails provide all forms of FDA-approved MOUDs and facilitate continuation of MOUD in the community on release (Evans et al., 2021). Further exploration of policies and practices that promote MOUD access and use among legal-involved populations is warranted.

While correctional facilities finance SUD treatment of individuals while they are incarcerated, individuals in the community, with or without criminal legal involvement, are generally responsible for financing their own treatment, often using health insurance benefits or self-pay. Previous work has demonstrated that Medicaid expansion is associated with an increased in insurance access among individuals with criminal legal involvement (Howell et al., 2022). Furthermore, Medicaid coverage has been associated with higher rates of substance use treatment when compared with other types of coverage for individuals with criminal legal involvement (Winkelman et al., 2016). In a study led by our team, we found that MOUD receipt increased by a greater extent in states that expanded Medicaid compared with states that did not, both among individuals with CLI and for the general population (Khatri et al., 2021). However, the absolute difference in MOUD receipt associated with Medicaid expansion was larger among individuals without criminal legal involvement when compared to individuals with criminal legal involvement. This suggests that while insurance access does expand access to MOUD, other state-level factors are likely contributing to lower rates of MOUD among individuals with criminal legal

involvement.

As a result of the widespread criminalization of SUDs, criminal legal-involved populations have higher rates of SUDs and therefore higher rates of treatment referrals when compared to the general population (Lynch, 2012). This is not necessarily beneficial, however, as individuals with substance use disorders implicated in the coercive and punitive criminal legal system, among which racial and ethnic minorities are disproportionately overrepresented, have different agency and pressures, trajectories, and outcomes in substance use treatment when compared to the general public (Booth et al., 2013; Csete et al., 2016; Rosenberg et al., 2019; Bath et al., 2019; Longinaker and Terplan, 2014). Furthermore, many local factors such as geographic variations in drug use, degree of police surveillance, policies of sentencing by district attorneys and judges, and the availability and accessibility to treatment services all impact the state and county-level context of the intersection of criminal legal policy and the overdose crisis (King, 2008). Further research that seeks to explore how specific state and county-level criminal legal policies influence trends of drug enforcement, drug use, and referral to addiction treatment services is critical to effectively tailoring clinical practice, state policy, and allocation of federal and state resources based on the local practices and procedures. Given the importance of access to timely and quality SUD treatment for this population, efforts should be made to standardize and monitor treatment across the criminal-legal system. This would allow state and federal agencies to assess parity between individuals with and without criminal-legal involvement, improve treatment referrals from within the criminal-legal system, and increase treatment capacity in the community.

The criminal legal-referred cohort in our study likely experienced coercion and/or legal pressure to attend addiction treatment. While there is strong evidence in support of initiating or continuing treatment for SUDs during incarceration for individuals who request it (Kinlock et al., 2009; Rich et al., 2015) the evidence supporting compulsory drug treatment in the community is weak. A recent review from 2016 by Werb et al. reported “evidence does not, on the whole, suggest improved outcomes related to compulsory treatment approaches, with some studies suggesting potential harms” and recommended the prioritization of non-compulsory treatment modalities (Werb et al., 2016). The descriptive findings of our research adds an additional consideration to the debate on coerced drug treatment as we demonstrate that the substance use treatment in terms of rates of admissions, substances leading to treatment admission, and rates of MOUD, varies considerably among legal-referred individuals across the United States, further complicating the landscape of addiction treatment for individuals with criminal legal-involvement.

5. Limitations

Because TEDS-A includes data on treatment episodes, rather than patients, some individuals maybe represented more than once (Shearer et al., 2022). However, TEDS-A excludes transfers thus each episode represents a unique treatment admission. In previous work, we found that estimates did not substantially change when only treatment admissions of individuals with no prior treatments were included (Shearer et al., 2022). Although, TEDS-A is the largest dataset of substance use treatment episodes in the US, it does not include information from clinics, private pay treatment centers, or from jails or prisons. TEDS-A includes facility data from state administrative systems and therefore data missingness may vary by state, year, or variable. We addressed this limitation by excluding any state that had high rates of missingness (i.e., >25%) for the MOUD variable of interest. The findings we report do not include all instances of substance use treatment, such as office-based buprenorphine treatment programs, but do reflect all publicly funded treatment admissions to rehabilitation and detoxification facilities. The patterns and characteristics of treatment between individuals referred from the criminal legal system and those with non-criminal legal

¹ Montana, Oklahoma, and Virginia did not report the use of MOUD in any treatment episodes from criminal legal or non-criminal legal referrals. Florida, Kansas, Michigan, Nevada, New Jersey, New Mexico, Rhode Island, South Carolina, and West Virginia were excluded from the analysis because > 25 % of admissions were missing data on the use of MOUD.

referrals reflect important differences in treatment at facilities commonly used by the criminal legal system.

We adjusted the overall referral rates to account for state-level differences in the overdose crisis but did not adjust for other state-level differences in sociodemographic profiles. Importantly, causality should not be interpreted from these results as they rely on cross-sectional data. However, these unadjusted descriptive results provide important information for state policy makers by highlighting differences in substance use treatment patterns across states.

6. Conclusion

We found significant variation across states in the rates of treatment admission adjusted for overdose mortality, the most common primary substance leading to treatment admission, and the rates of MOUD for OUD treatment admissions. Furthermore, we found within state variation of the relative rates of treatment admissions between criminal legal and the general population. These differences highlight the need to further study state-specific policies and practices that shape drug policy and the substance use treatment landscape for people with criminal legal involvement.

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Contributors

Study conception and design: UK, RS, TW; data collection: RS; analysis and interpretation of results: RS; draft manuscript preparation: RS, UK All authors reviewed the results and approved the final version of the manuscript.

Conflict of Interest

No conflict declared.

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None.

Appendix A. Supporting information

Supplementary data associated with this article can be found in the online version at [doi:10.1016/j.drugalcdep.2022.109651](https://doi.org/10.1016/j.drugalcdep.2022.109651).

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