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State Criminal Justice Policy Context and Opioid Agonist Treatment Delivery among Opioid Treatment Admissions, 2015

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Abstract

Background: Criminal justice referral to treatment is associated with reduced odds of receiving opioid agonist treatment (OAT), the gold-standard treatment for opioid use disorder. States vary substantially in the extent of criminal justice system involvement in opioid treatment; however, the effects on treatment provision are not clear. We examined whether state-level criminal justice involvement in the substance use treatment system modified the association between criminal justice referral to treatment and OAT provision among opioid treatment admissions.

Methods: We conducted a random effects logistic regression to investigate how the effects of criminal justice referral to treatment on OAT provision differed in states with high vs. low state-level criminal justice involvement in opioid treatment, adjusting for individual and state-level covariates, among 22 states in the 2015 Treatment Episode Dataset-Admissions.

Results: Criminal justice referral to treatment was associated with an 85% reduction in the odds of receiving OAT, compared to other sources of treatment referral (OR= 0.15; 95% CI: 0.15, 0.16). Among opioid treatment admissions resulting from criminal justice referral in 2015, receiving treatment in high criminal justice involvement states was associated with a 63% reduction in the odds of OAT provision, compared to opioid treatment received in low criminal justice involvement states (interaction OR=0.37, 95% CI: 0.11, 0.89).

Conclusion: The effects of criminal justice referral to treatment on OAT provision varied by criminal justice involvement in opioid treatment at the state level. Targeted interventions should increase access to OAT in states that rely on the criminal justice system for opioid treatment referrals.

Keywords

Criminal justice; opioid agonist treatment (OAT); opioid use disorder; substance use treatment access; state policy; medication assisted treatment; methadone; buprenorphine; medication for opioid use disorder

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1. Introduction:

In 2016, there were over 63,000 drug overdose deaths in the United States, of which two-thirds involved an opioid (Hedegaard et al., 2018). Medication is the gold-standard treatment for opioid use disorder (OUD), and includes opioid agonist treatment (OAT) with buprenorphine (partial agonist) or methadone (full agonist), or naltrexone (antagonist) (National Academies of Sciences and Medicine, 2019). Medication for OUD, such as OAT, has been demonstrated to reduce the risk of fatal overdose (Darke and Hall, 2003; Gibson et al., 2008; Van den Brink and Haasen, 2006; Volkow et al., 2014). Despite this, OAT is underutilized in the treatment of OUD (Volkow et al., 2014), and there is a significant gap between OUD treatment need and OAT capacity nationally (Jones et al., 2015; Mojtabai et al., 2019).

There is substantial variation across states in OAT utilization and capacity, with states in the Northeastern United States having higher rates of methadone and buprenorphine utilization than the rest of the country (Jones et al., 2015). However, variations in OAT capacity cannot be explained simply by different levels of treatment need by state. Rather, prior research establishes the importance of state policy contexts in influencing the availability of OAT (Bachhuber et al., 2017; Ducharme and Abraham, 2008; Knudsen and Abraham, 2012; Saloner et al., 2016). That is, states differ in the presence of policies which facilitate use of OAT for opioid use disorder, such as Medicaid coverage for methadone and buprenorphine treatment, suggesting the salience of state-level policies and regulations on the adoption of OAT across treatment facilities (Bachhuber et al., 2017; Saloner et al., 2016).

An understudied but likely consequential political factor impacting the utilization of OAT in opioid treatment programs is the influence of state criminal justice systems on treatment provision. There is widely documented reluctance within the criminal justice system to use OAT to treat individuals with OUD (Freudenberg and Heller, 2016; Krawczyk et al., 2017b; Matusow et al., 2013; Mitchell et al., 2016a). Many criminal justice diversion to drug treatment programs reject the use of OAT in favor of abstinence-based treatment (Matusow et al., 2013), and opioid treatment admissions resulting from justice-referral are significantly less likely to receive OAT than admissions referred from other sources (Angelotta et al., 2016; Krawczyk et al., 2017b). Critically, states differ not only in the proportion of opioid treatment admissions resulting from criminal justice referral, but also in the presence of laws and policies which facilitate increased justice involvement in substance use treatment provision (Christopher et al., 2015; Vestal, 2017). Thus, it is important to consider how the state criminal justice policy context surrounding the provision of substance use treatment may be an important determinant of the type of opioid treatment delivered.

This study builds on prior evidence on the influence of state policy contexts on OAT provision, as well as documented resistance within the criminal justice system to adopting OAT, to consider the influence of state-level criminal justice involvement in opioid treatment provision on the utilization of OAT. Specifically, we assessed whether the effects of criminal justice referral to treatment on OAT provision differed between states characterized by high versus low criminal justice involvement in opioid treatment.

2. Methods:

2.1 Data sources:

The 2015 Treatment Episode Data Set (TEDS), which is collected and administered by the United States Department of Health and Human Services, Substance Abuse and Mental Health Services Administration (United States Department of Health and Human Services Center for Behavioral Health Statistics and Quality., 2015), provides demographic and substance abuse characteristics of admissions to alcohol or drug treatment facilities which report to individual state administrative data systems. The TEDS included admissions in calendar year 2015 received and processed through November 1, 2016 from providers receiving public funding, for a total of 1,537,025 treatment admissions in 2015.

2.2 Sample inclusions and exclusions:

We used the 2015 TEDS Appendix A to limit our dataset to include states with the same data reporting characteristics, accounting for the variation across states in whether they report data on all clients within facilities or only on publicly funded clients within facilities (United States Department of Health and Human Services Center for Behavioral Health Statistics and Quality., 2015). Specifically, 26 states not including Puerto Rico reported data on all clients in facilities licensed by state authorities, facilities receiving state or public funding, or both. Of these, 4 were excluded because they did not report or collect data on the delivery of OAT. The following states were included: Alabama, Alaska, Arkansas, California, Connecticut, Hawaii, Iowa, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Minnesota, Mississippi, Nevada, New Jersey, New York, North Carolina, Rhode Island, South Dakota, Utah, and Vermont. Finally, the dataset was limited to opioid treatment admissions, defined as treatment admissions where opioids (i.e., heroin, methadone, or prescription opioids) were the primary substance of abuse on admission; observations with missing data for the exposure, outcome, and covariates of interest were deleted. After all exclusions, there were 364,422 opioid treatment admissions across 22 states included in the final sample.

2.3 Measures

Criminal justice referral to treatment: This exposure variable was dichotomized into a binary variable using the TEDS question on the treatment referral source. If the source of treatment referral was “Court/ Criminal Justice Referral/ DUI/ DWI”, then the treatment admission was considered a criminal justice referral. All other sources of treatment referral were collapsed into the “Not Criminal Justice Referral” category.

Proportion of opioid treatment admissions resulting from criminal justice referral at the state level: First, the median proportion of criminal justice referrals for opioid treatment admissions was calculated across the included 22 states (18.6%). States with proportions of opioid treatment admissions resulting from criminal justice that were above the median were defined as “high criminal justice involvement in opioid treatment” states, while states that had proportions below the median were defined as “low criminal justice in opioid treatment” states.

Inclusion of OAT in the treatment plan among opioid-treatment admissions.—

This was a binary indicator of whether medication-assisted opioid therapy such as buprenorphine or methadone would be included in the client's treatment plan, which was included in the TEDS 2015 admissions data.

Individual-level covariates included gender (Male, Female), race/ethnicity (Non-Hispanic White, Non-Hispanic Black, Hispanic, and Non-Hispanic Other), age (12-17, 18-24, 25-34, 35-44, 45-54, 55+), education status (less than high school, high school graduate, some college, college graduate or more), and employment status (full-time employment, part-time employment, unemployed, not in labor force). The individual-level covariates were included based on prior research on the relationship between criminal justice referral to treatment and the provision of OAT for opioid use disorder (Krawczyk et al., 2017b, 2017a).

State-level covariates were the state Medicaid coverage of methadone treatment, and the presence and utilization of civil commitment laws for specifically substance use treatment. State Medicaid coverage was included as a covariate because recent studies estimated that the odds of receiving OAT among opioid treatment admissions were substantially higher in states with Medicaid programs that cover methadone treatment than in states with Medicaid programs that do not cover methadone treatment (Bachhuber et al., 2017; Saloner et al., 2016). Information on state Medicaid coverage was retrieved from a 2014 report by the Substance Abuse and Mental Health Services Administration and reflected coverage policies in 2011-2013 (Mark et al., 2014). Finally, civil commitment laws might facilitate criminal justice referrals to substance use treatment, as they are mechanisms through which the families of individuals with opioid use disorders may petition the court to deliver mandatory treatment sentences. Since there was wide variation across states in both the implementation and utilization of these laws (Christopher et al., 2015), the presence of such laws was included as a state-level covariate.

2.4 Statistical Analysis

First, we assessed the relationships between individual covariates and criminal justice referral to treatment by comparing the proportions of admissions in each demographic and socioeconomic category between criminal justice and non-criminal justice opioid treatment admissions. We repeated this procedure to assess the relationships between the individual and state-level covariates with the outcome of interest, inclusion of OAT in the treatment plan, as well as with the state-level exposure, high vs. low criminal justice involvement in opioid treatment at the state level.

We conducted a multivariable logistic regression with state-level random effects that included the provision of OAT as the outcome variable, criminal justice referral to treatment and state-level criminal justice involvement in treatment as the exposure variables, and both individual and state-level covariates. We used state-level random effects to control for clustering of individuals within each state; failure to account for clustering of treatment admissions at the state level might result in the underestimation of standard errors, and therefore an increased Type I error rate (Galea, 2007). In order to test whether the effect of criminal justice referral to treatment on OAT provision varied by the state criminal justice policy context, we conducted an additional model including an interaction term between

criminal justice referral to treatment and state-level criminal justice involvement in opioid treatment, adjusting for individual and state-level covariates.

3. Results:

There were 49,649 opioid treatment admissions with criminal justice as the source of referral in 2015, representing 13.6% of all opioid treatment admissions in that year. Among all opioid treatment admissions, individual referrals were the most common (i.e., 61.0% of all opioid treatment admissions), followed by referrals by alcohol/drug use care providers (i.e., 13.7% of all opioid treatment admissions).

3.1 Correlates of criminal justice referrals to opioid use disorder treatment:

Table 1 shows the individual correlates of criminal justice referral to treatment among opioid admissions in 2015. Criminal justice referral to opioid treatment was more common among males than females (14.7% vs. 11.8%), and among Non-Hispanic Whites compared to Non-Hispanic Blacks and Hispanics (14.5% vs. 9.4% and 13.2%, respectively). Compared to college graduates, individuals with less than high school education, high school graduates and those with some college had higher proportions of criminal justice referral (8.9%, 13.9%, 14.1%, and 13.6%, respectively). Finally, proportions of treatment admissions resulting from criminal justice referral were similar across unemployed individuals and individuals with part-time and full-time employment, but the proportion was lower among individuals not in the labor force (14.5%, 14.9%, 15.4%, and 12.4%, respectively).

3.2 Correlates of state-level Criminal Justice Involvement in Opioid Treatment

There were 48,216 opioid treatment admissions in states with high criminal justice involvement in treatment, of which almost 30% were CJ referrals (n=14,449). There were 316,206 opioid treatment admissions in states with low criminal justice involvement in treatment, of which approximately 11% were CJ referrals (n=35,200). There was significant overlap between the level of criminal justice involvement in the opioid treatment system at the state level and state Medicaid policies covering methadone treatment. Of the 11 states designated as “high criminal justice involvement states”, five had Medicaid programs which covered methadone. Of the 11 “low criminal justice involvement states”, ten had Medicaid programs which covered methadone. Finally, eight of the 11 high criminal justice involvement states had civil commitment laws, compared to six of the 11 low criminal justice involvement states.

3.3 Correlates of Inclusion of OAT in treatment plan:

Overall, 39% of opioid treatment admissions included OAT in the treatment plan (n=143,714) (Table 2). Among opioid treatment admissions, OAT provision was more common among women than men (44.8% vs. 36.4%). OAT was less commonly included in the treatment plan for admissions among individuals ages 12-17, compared to older age categories. OAT was most commonly included in opioid treatment admissions among Non-Hispanic Black clients, followed by Hispanic and Non-Hispanic White clients (52.9%, 42.1%, and 36.9%, respectively). Among state-level correlates, opioid treatment admissions

including OAT in the treatment plan were more common among states with Medicaid coverage of methadone treatment and states without civil commitment laws.

3.4 Odds of inclusion of OAT in treatment plan by state-level criminal justice involvement in opioid treatment and criminal justice referral to treatment

Supplemental figures 1A and 1B show the relationship between state-level criminal justice involvement in opioid treatment and the percentage of opioid treatment admissions receiving OAT by state among all opioid treatment admissions and justice-referred treatment admissions, respectively. There was a general negative trend between state-level justice involvement in opioid treatment and the percentage of opioid treatment admissions receiving OAT (Supplemental figure 1A), with states characterized by higher justice involvement in opioid treatment having lower proportions of opioid treatment admissions including OAT. Of note, the variation in the percentage of opioid treatment admissions receiving OAT by state was greater among states characterized by low justice involvement in opioid treatment than among those characterized by high justice involvement.

Among opioid treatment admissions in 2015, the odds of inclusion of OAT in the treatment plan given criminal justice referral were 85% lower than the odds of inclusion of OAT among admissions with other sources of referral (adjusted odds ratio [aOR]= 0.15, 95% CI: 0.15, 0.16), adjusting for gender, race, age, education, employment, state civil commitment laws, and state Medicaid coverage of methadone treatment (Table 3). Furthermore, the odds of OAT provision in states with high criminal justice involvement in opioid treatment were 48% lower than in states with low criminal justice involvement in opioid treatment, although this difference was not statistically significant (aOR= 0.52, 95% CI: 0.16, 1.70).

In testing the interaction between individual-level criminal justice referral to treatment and state-level criminal justice involvement in opioid treatment, we found that the effects of criminal justice involvement in treatment on the inclusion of OAT in the treatment plan varied significantly by state-level criminal justice involvement in opioid treatment (Table 4). In high criminal justice involvement states, admissions referred through criminal justice had 93% lower odds of OAT inclusion in the treatment plan, compared to other sources of treatment referral (aOR= 0.07, 95% CI: 0.07, 0.08). In low criminal justice involvement states, admissions referred through criminal justice had 81% lower odds of OAT inclusion in the treatment plan, compared to other sources of referral (aOR= 0.19, 95% CI: 0.18, 0.20). This translated to a 63% decrease in the relative odds of OAT provision when referred through the criminal justice system in states characterized by high vs. low criminal justice involvement in opioid treatment (aOR=0.37, 95% CI: 0.11, 0.89).

4. Discussion:

In this study, we investigated how the effects of criminal justice referral to treatment on OAT provision varied by state-level criminal justice system involvement in opioid treatment in 22 states reporting opioid treatment admissions in publicly funded specialty treatment facilities in 2015. Specifically, this study built on prior evidence demonstrating the role of criminal justice referral to treatment in decreasing the likelihood of OAT provision by assessing how this effect was modified in contexts of high criminal justice involvement in opioid treatment

at the state level. We found that OAT provision given criminal justice referral to treatment was substantially less likely in states characterized by high versus low criminal justice involvement in opioid treatment. Overall, our results indicate that state criminal justice policy contexts are an important determinant of OAT provision among individuals with OUD.

In 2015, we found that state-level criminal justice involvement in opioid treatment modified the impact of individual-level criminal justice referral to treatment on the type of opioid treatment provided. Opioid treatment admissions resulting from criminal justice referral were even less likely to include OAT in states characterized by high criminal justice involvement in opioid treatment than in low criminal justice involvement states. We found that among opioid treatment admissions with criminal justice as the source of referral in 2015, living in a state with high criminal justice involvement in opioid treatment was associated with a 63% relative decrease in the odds of receiving OAT. In line with prior research, we also found that criminal justice referral to treatment at the individual level was associated with a substantial decrease in the odds of receiving OAT. Although we did not find a statistically significant independent effect of state-level criminal justice involvement in treatment on OAT provision beyond individual-level criminal justice referral, the estimated 48% lower odds of OAT suggested clinically significantly reduced odds of OAT related to state-level criminal justice involvement across referral sources.

Our study builds on prior evidence demonstrating the role of state policy environments in driving OAT availability and provision. In an assessment of OAT treatment capacity across the United States in 2012, Jones and colleagues found that the gap between treatment need and capacity varied significantly across states, and pointed to several state policy factors driving the differential implementation of OAT across states (Jones et al., 2015). For example, state Medicaid coverage of methadone has been associated with increased likelihood of individuals with OUD receiving methadone maintenance (Bachhuber et al., 2017; Saloner et al., 2016), and state Medicaid coverage of buprenorphine increased the adoption of buprenorphine in treatment agencies statewide (Ducharme and Abraham, 2008). The priorities and views of state substance use treatment regulatory agencies with regards to OAT provision might also drive the adoption of OAT by treatment programs statewide—publicly funded substance use treatment programs were more likely to utilize methadone or buprenorphine if providers perceived the support of state regulatory agencies for these medications (Knudsen and Abraham, 2012). Overall, OAT treatment capacity and utilization statewide is influenced by the state policy environment, which is a function of both concrete state policies such as insurance coverage, as well as the broader support of state regulatory and funding agencies for the use of medications for addiction treatment.

Our study fills an important gap in the literature, as there is little research on the criminal justice system as a state-level determinant of the type and quality of available substance use treatment, despite widespread and well-documented resistance within the justice system to the utilization of OAT for opioid use disorders (Freudenberg, 2001; Freudenberg and Heller, 2016; Krawczyk et al., 2017b; Legal Action Center, 2011; Matusow et al., 2013; Mitchell et al., 2016b; Nunn et al., 2009). Prior research has demonstrated low rates of OAT provision across criminal justice settings, including correctional facilities and drug courts (Matusow et

al., 2013; Nunn et al., 2009). Furthermore, our findings are consistent with results demonstrating decreased odds of OAT provision to individuals with OUD referred through the criminal justice system. A recent study found that only 4.6% of opioid treatment admissions in 2014 referred from criminal justice included OAT, compared to 40.6% of treatment admissions with other sources of referral (Krawczyk et al., 2017b), while another study showed that the odds of *not* receiving OAT were seven times higher among pregnant women in opioid treatment resulting from criminal justice compared to self-referral (Angelotta et al., 2016).

Critically, states vary substantially in the level of justice involvement in substance use treatment provision—variation which is reflective of differential implementation of diversion to treatment programs and civil commitment laws (Christopher et al., 2015; VanderWaal et al., 2006), differences in funding mechanisms for substance use treatment programs (Knudsen et al., 2011; Mark et al., 2014), and discrepancies in the level of criminalization of drug-related offenses. We measured the extent of justice involvement in opioid treatment provision, with the intention of capturing how much of state opioid treatment delivery is driven by the justice system. Given historical and contemporary reluctance within the criminal justice system to OAT, we sought to determine if justice involvement in opioid treatment provision is a relevant component of the state policy environment influencing OAT provision statewide; our findings indicate that it is.

Importantly, states characterized by low-criminal justice involvement in opioid treatment varied substantially in the proportion of opioid treatment admissions receiving OAT, suggesting that there are a multitude of factors driving the level of OAT provision within a state. While high justice involvement in opioid treatment significantly decreases the odds of OAT provision, particularly among justice-referred individuals, lower rates of state-level justice involvement does not indicate the absence of other state-level barriers to OAT utilization. Our study demonstrates that high criminal justice system involvement in substance use treatment is an important state-level determinant of the type and quality of opioid treatment provided. Targeted interventions should aim to increase access to OAT in states that rely on the criminal justice system for OUD treatment referrals.

Future work is necessary to disentangle the legal, political, and economic factors driving justice system involvement in opioid treatment provision, as well as to identify the ways in which various state-level factors interact to create policy environments which facilitate or inhibit the use of OAT and other evidence-based interventions. Additionally, future research will address differences in the rates of criminal justice referral to treatment and receipt of OAT by race/ethnicity, as preliminary results from our study, as well as prior research, suggests disparities in criminal justice diversion to treatment (Nicosia et al., 2013).

4.1 Limitations:

This study was conducted using a cross-sectional dataset from 2015. Temporality could not be disentangled between the exposure and outcomes of interest. Due to significant differences across states in data reporting and collection methods, only 22 states could be included in the analysis. Therefore, this study may have been underpowered to capture the effects of state-level factors. Of note, four states were excluded from the analysis because

they either did not report or collect data on OAT—to the extent that this reflects decreased OAT utilization in these four states, it is possible that we underestimated the true association between state-level criminal justice involvement in treatment and OAT provision.

Furthermore, the outcome variable of OAT did not differentiate between buprenorphine or methadone, and did not include information on the use of naltrexone. Additionally, buprenorphine treatment received in private clinics was not captured in this dataset. Thus, our findings cannot be generalized to facilities systematically excluded from the TEDS.

Finally, we created the exposure variable of high state-level criminal justice involvement in opioid treatment by assessing the proportion of opioid treatment admissions resulting from criminal justice referrals, entailing some assumptions. First, this exposure variable assumes that the proportion of opioid treatment admissions resulting from criminal justice referrals was adequately representative of criminal justice involvement in the state opioid treatment system. Second, the creation of this exposure variable assumes that the effects of criminal justice involvement in opioid treatment at the state level on the type of treatment delivered are homogenous across the state (Galea, 2007).

4.2 Strengths:

Despite these limitations, this study has several strengths. First, we explicitly focused on state-level factors as determinants of substance use treatment provision, thereby contributing to an important topic with scarce literature to date. Additionally, the measure of criminal justice involvement in a state's opioid treatment system was based on the proportion of treatment admissions resulting from criminal justice referral, as opposed to the presence or absence of state laws facilitating criminal justice referral to treatment. The latter measure would have been misleading, as the presence of such laws does not necessarily mean that they are being utilized (Christopher et al., 2015).

4.3 Conclusions

We investigated how the state criminal justice policy context influenced the likelihood of receiving OAT by assessing how the effects of criminal justice referral to treatment on OAT provision varied by the level of criminal justice system involvement in opioid treatment admissions statewide. Results suggest that the negative effects of individual criminal justice referral on OAT provision are heightened in states characterized by high criminal justice involvement in opioid treatment—opioid treatment admissions resulting from criminal justice referral were substantially less likely to receive OAT in states with high criminal justice involvement than in states with low criminal justice involvement in opioid treatment. As public interest and support for the implementation of criminal justice treatment diversion programs grows in the wake of the opioid overdose epidemic, it is important that the type and quality of treatment utilized in these programs is rigorously interrogated. Given the substantial variation across state criminal justice systems, the relationship between state criminal justice policy contexts and the implementation and use of OAT and other evidence-based interventions must be examined to decrease opioid overdose rates. From a public health perspective, we must increase access to medication to treat OUD in the community to reduce the reliance on the criminal justice system as a way to get into treatment.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Table 1.

Proportion of opioid treatment admissions referred through the criminal justice system by demographic group and state-level characteristics in the United States, 2015.

Demographic Characteristics	Criminal Justice Referral to Treatment	
	N	Row %
Gender		
Male	33,937	14.66
Female	15,712	11.82
Age Category		
12 to 17	333	23.14
18 to 24	10,522	17.59
25 to 34	22,837	15.34
35 to 44	9,026	12.42
45 to 54	5,270	9.42
55 and Older	1,661	6.46
Race and Ethnicity		
White NH	36,730	14.51
Black NH	4,340	9.38
Hispanic	6,588	13.15
Other NH	1,991	13.30
Education		
Less than High School	13,830	13.85
High School Graduate	24,946	14.08
Some College	8,975	13.58
College Graduate	1,898	8.93
Employment		
Full Time	7,417	15.35
Part Time	3,550	14.94
Unemployed	17,053	14.52
Not in Labor Force	21,629	12.37
State Characteristics	N	Row %
Medicaid coverage of methadone maintenance		
Yes	46,013	13.20
No	3,636	22.91
Civil commitment law		
Yes	11,100	13.05
No	38,549	13.80

Notes: NH= Non-Hispanic.

Table 2.

Proportions of opioid treatment admissions with opioid agonist treatment in the treatment plan by demographic group and state-level characteristics in the United States, 2015.

Demographic Characteristics	Opioid Agonist Treatment Provision	
	N	Row %
Gender		
Male	84,141	36.35
Female	59,573	44.82
Age Category		
12 to 17	111	7.71
18 to 24	15,995	26.75
25 to 34	52,028	34.96
35 to 44	31,033	42.71
45 to 54	28,576	51.06
55 and Older	15,971	62.09
Race and Ethnicity		
White NH	93,368	36.90
Black NH	24,489	52.90
Hispanic	21,077	42.07
Other NH	4,780	31.93
Education		
Less than High School	42,713	42.79
High School Graduate	70,210	39.61
Some College	21,380	32.35
College Graduate	9,411	44.26
Employment		
Full Time	23,373	48.36
Part Time	12,221	51.44
Unemployed	45,185	38.46
Not in Labor Force	62,935	35.99
State Characteristics	N	Row %
Medicaid Coverage of Methadone Maintenance		
Yes	141,409	40.57
No	2,305	14.52
Civil Commitment Law		
Yes	20,546	20.59
No	123,168	46.54

Notes: NH= Non-Hispanic.

Table 3.

Adjusted odds of inclusion of opioid agonist treatment in the treatment plan by criminal justice referral to treatment and high state-level criminal justice involvement in opioid treatment, 2015^a.

Exposure	Adjusted Odds Ratio	95% Confidence Interval
Individual referral source		(0.15, 0.16)
Criminal justice referral to treatment	0.15	
Non-criminal justice referral source	Ref	
State-level criminal justice involvement in opioid treatment^b		(0.16, 1.70)
High involvement state	0.52	
Low involvement state	Ref	

^aResults presented from multivariable logistic regression with state-level random effects modeling opioid agonist treatment provision given criminal justice referral to treatment and state-level criminal justice involvement in opioid treatment, controlling for gender, race/ethnicity, age, education status, employment status, state Medicaid coverage of methadone treatment, and presence of state civil commitment law.

^bHigh compared to low state-level criminal justice involvement in opioid treatment, where high criminal justice involvement states are defined as states where the proportion of opioid treatment admissions resulting from criminal justice referral is higher than the median.

Table 4.

Adjusted odds of inclusion of opioid agonist treatment in the treatment plan given criminal justice referral to treatment: Testing effect modification in states characterized by high vs. low criminal justice involvement in opioid treatment, 2015^a.

<u>Effect Modification by State-level Criminal Justice Involvement in Opioid Treatment</u>	Adjusted Odds Ratio	95% Confidence Interval
States with High Criminal Justice Involvement in Opioid Treatment		
Criminal justice referral to treatment	0.07	(0.07, 0.08)
Non-criminal justice referral source	Ref	
States with Low Criminal Justice Involvement in Opioid Treatment		
Criminal justice referral to treatment	0.19	(0.18, 0.20)
Non-criminal justice referral source	Ref	

^aResults presented from multivariable logistic regression with state-level random effects testing the interaction of criminal justice referral to treatment and state-level criminal justice involvement in opioid treatment on the inclusion of opioid agonist treatment provision in the treatment plan, controlling for gender, race/ethnicity, age, education status, employment status, state Medicaid coverage of methadone treatment, and presence of state civil commitment law.