Original Investigation | Psychiatry

Differences in Availability and Use of Medications for Opioid Use Disorder in Residential Treatment Settings in the United States

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Abstract

IMPORTANCE While many individuals with opioid use disorder seek treatment at residential facilities to initiate long-term recovery, the availability and use of medications for opioid use disorder (MOUDs) in these facilities is unclear.

OBJECTIVE To examine differences in MOUD availability and use in residential facilities as a function of Medicaid policy, facility-level factors associated with MOUD availability, and admissions-level factors associated with MOUD use.

DESIGN, SETTING, AND PARTICIPANTS This cross-sectional study used deidentified facility-level and admissions-level data from 2863 residential treatment facilities and 232 414 admissions in the United States in 2017. Facility-level data were extracted from the 2017 National Survey of Substance Abuse Treatment Services, and admissions-level data were extracted from the 2017 Treatment Episode Data Set–Admissions. Statistical analyses were conducted from June to November 2019.

EXPOSURES Admissions for opioid use disorder at residential treatment facilities in the United States that identified opioids as the patient's primary drug of choice.

MAIN OUTCOMES AND MEASURES Availability and use of 3 MOUDs (ie, extended-release naltrexone, buprenorphine, and methadone).

RESULTS Of 232 414 admissions, 205 612 (88.5%) contained complete demographic data (166 213 [80.8%] aged 25-54 years; 136 854 [66.6%] men; 151 867 [73.9%] white). Among all admissions, MOUDs were used in only 34 058 of 192 336 (17.7%) in states that expanded Medicaid and 775 of 40 078 (1.9%) in states that did not expand Medicaid ($P < .001$). A relatively low percentage of the 2863 residential treatment facilities in this study offered extended-release naltrexone (854 [29.8%]), buprenorphine (953 [33.3%]), or methadone (60 [2.1%]). Compared with residential facilities that offered at least 1 MOUD, those that offered no MOUDs had lower odds of also offering psychiatric medications (odds ratio [OR], 0.06; 95% CI, 0.05-0.08; Wald $\chi_1^2 = 542.09$; $P < .001$), being licensed by a state or hospital authority (OR, 0.39; 95% CI, 0.27-0.57; Wald $\chi_1^2 = 24.28$; $P < .001$), or being accredited by a health organization (OR, 0.28; 95% CI, 0.23-0.33; Wald $\chi_1^2 = 180.91$; $P < .001$). Residential facilities that did not offer any MOUDs had higher odds of accepting cash-only payments than those that offered at least 1 MOUD (OR, 4.80; 95% CI, 3.47-6.64; Wald $\chi_1^2 = 89.65$; $P < .001$).

CONCLUSIONS AND RELEVANCE In this cross-sectional study of residential addiction treatment facilities in the United States, MOUD availability and use were sparse. Public health and policy efforts

(continued)

Abstract (continued)

to improve access to and use of MOUDs in residential treatment facilities could improve treatment outcomes for individuals with opioid use disorder who are initiating recovery.

Introduction

The opioid crisis has affected US individuals from all walks of life. To address this public health emergency, it is crucial to transition individuals with active opioid use disorder (OUD) into long-term, meaningful recovery.[1,2] Residential treatment facilities are frequently viewed as the highest level of care across substance use disorders, providing an expensive[3,4] yet effective means of addressing the challenges that occur in early recovery,[5,6] often through comprehensive behavioral interventions that provide a foundation for long-term recovery.[7] However, the US addiction treatment infrastructure was largely developed separately from mainstream medicine,[8,9] and there is a pressing need to better integrate behavioral treatment for addiction with medical care to address the complex challenges faced by individuals with OUD.

Several medications for OUD (MOUDs) are now considered by the medical community to be the criterion standard in initiating and sustaining long-term OUD recovery.[2] Despite current public health efforts to bridge paraprofessional and medical care,[10,11] most individuals with OUD still do not have access to or receive any form of MOUD.[12,13] Broadly speaking, US Food and Drug Administration–approved MOUDs act on the μ-opioid receptor and include the full agonist methadone,[14] the partial agonist buprenorphine (sublingual,[15] subdermal implants,[16] and extended-release depot injections[17]), and the antagonist naltrexone (oral and extended-release depot injections [XR-NTX][18]). Although these MOUDs are frontline treatments for moderate to severe OUD, potential patients continue to face challenges with insurance coverage and treatment accessibility,[19] and clinicians continue to face legal and practical barriers to prescribing MOUDs.[20-24]

While trends in access to MOUDs across the United States are generally improving,[25,26] state-level disparities, which might reflect regional differences in stigma, especially toward buprenorphine and methadone, are still evident.[27,28] For instance, several studies have reported that MOUD availability and use are lower in states that were resistant to Medicaid expansion under the Patient Protection and Affordable Care Act compared with states that expanded Medicaid coverage.[29-31] Most of this research has focused on primary care[32] or outpatient addiction treatment facilities,[33] and there is little research on MOUD availability and/or use in residential facilities, which often embrace a 12-step treatment philosophy. However, differences in treatment philosophy among clinical staff who deliver 12-step care (and might themselves be in recovery),[34] patients seeking MOUDs vs medication-free treatment,[35] and medical professionals who deliver MOUDs might affect the adoption of MOUDs in residential settings. Regional differences in reimbursement for and access to MOUDs might further compound these issues and decrease the likelihood that residential facilities provide MOUDs.

Currently, there is no medical and/or behavioral standard of care for OUD across residential facilities, and the level and quality of care can vary greatly from 1 facility to the next.[7,36] Although most patients with OUD do not use residential treatment and instead enter outpatient treatment directly, individuals with OUD often report a preference for including residential treatment in their recovery trajectory.[19,37] Several states have recently seen an increase in residential addiction treatment facilities, and many have questionable standards of care.[38] The goals of this study were to examine national databases of facility-level and admissions-level data regarding the availability and use of MOUDs in residential addiction treatment programs. Specific goals were as follows: (1) to determine the association of state-level Medicaid policy with the proportion of residential treatment facilities that offered MOUDs and the proportion of residential treatment admissions that used any MOUD as part of their treatment plan; (2) to examine facility-level characteristics that were

associated with MOUD availability, including the availability of pharmacotherapies for psychiatric conditions, insurance coverage and payment options, licensing, and accreditation; (3) to examine admissions-level characteristics that were associated with planned use of MOUDs, including sex, race, age, veteran status, and criminal justice referral; and (4) to determine whether availability and use of MOUDs were associated with state-level opioid overdose mortality rates.
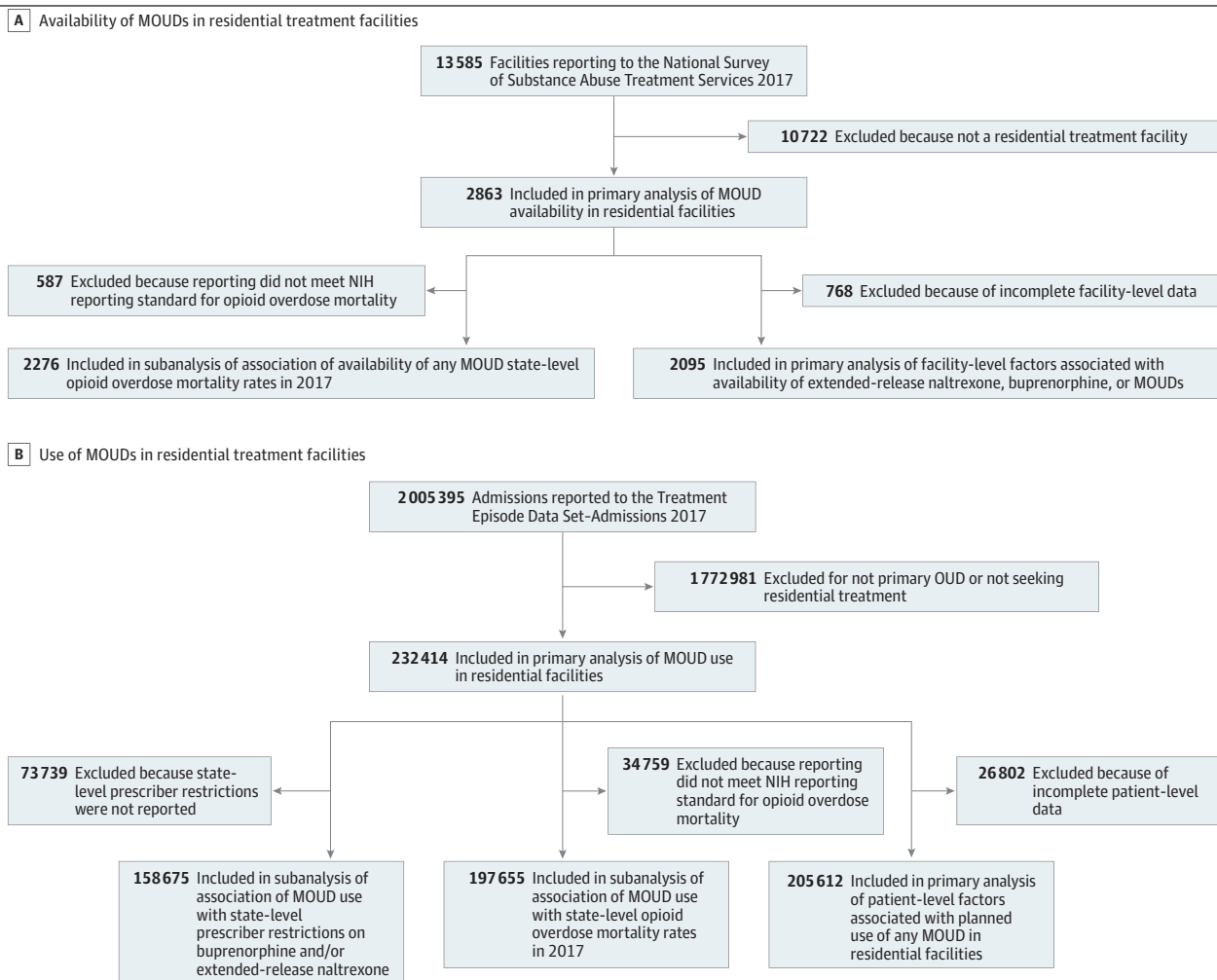
Methods

This cross-sectional study followed the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) reporting guideline. Per Common Rule, this study was exempt from institutional review board review because all data were deidentified and publicly available and, therefore, did not qualify as human subjects research.

Data Sources

Data for this study were collected from the 4 following publicly available sources: the 2017 National Survey of Substance Abuse Treatment Services (N-SSATS),[39] the 2017 Treatment Episode Data Set–Admissions (TEDS-A),[40] state-level opioid overdose mortality rates, and state-level information on Medicaid policy and coverage (**Figure 1**). Both N-SSATS and TEDS-A were made public through

Figure 1. Data Sources, Inclusion and Exclusion Factors, and Numbers Included in Primary and Subanalyses

A | Availability of MOUDs in residential treatment facilities

13 585 Facilities reporting to the National Survey of Substance Abuse Treatment Services 2017

→ 10 722 Excluded because not a residential treatment facility

2863 Included in primary analysis of MOUD availability in residential facilities

587 Excluded because reporting did not meet NIH reporting standard for opioid overdose mortality

768 Excluded because of incomplete facility-level data

2276 Included in subanalysis of association of availability of any MOUD state-level opioid overdose mortality rates in 2017

2095 Included in primary analysis of facility-level factors associated with availability of extended-release naltrexone, buprenorphine, or MOUDs

B | Use of MOUDs in residential treatment facilities

2 005 395 Admissions reported to the Treatment Episode Data Set–Admissions 2017

→ 1 772 981 Excluded for not primary OUD or not seeking residential treatment

232 414 Included in primary analysis of MOUD use in residential facilities

73 739 Excluded because state-level prescriber restrictions were not reported

34 759 Excluded because reporting did not meet NIH reporting standard for opioid overdose mortality

26 802 Excluded because of incomplete patient-level data

158 675 Included in subanalysis of association of MOUD use with state-level prescriber restrictions on buprenorphine and/or extended-release naltrexone

197 655 Included in subanalysis of association of MOUD use with state-level opioid overdose mortality rates in 2017

205 612 Included in primary analysis of patient-level factors associated with planned use of any MOUD in residential facilities

All primary analyses and subanalyses used all available data. MOUD indicates medication for opioid use disorder; NIH, National Institutes of Health; and OUD, opioid use disorder.

the Substance Abuse and Mental Health Services Administration. Only states reporting opioid mortality rates that met National Institutes of Health standards were used[41]; these data are available via the US Centers for Disease Control and Prevention Wide-Ranging Online Data for Epidemiological Research website.[42] State-level Medicaid information was made publicly available through the Henry J. Kaiser Family Foundation.[43]

Database Information and Variable Definitions

Data on residential treatment facilities were collected from the 2017 N-SSATS, a publicly available annual census of treatment facilities in the United States that collects facility-level data (eg, available medications, level of care, services provided, payment options) from hospital, residential, and outpatient substance use disorder treatment facilities.[39] We defined MOUD availability as offering XR-NTX, methadone, and/or sublingual or subdermal implant buprenorphine. Independent variables were chosen based on facility characteristics that might be associated with quality of care or patient access to treatment, including availability of psychiatric medications, acceptance of various forms of insurance (or cash-only, defined as not accepting insurance), licensing by a hospital or state authority, accreditation by a health organization, and availability of long-term (ie, >28 days) residential care.

Data on admissions for residential treatment facilities were collected from the 2017 TEDS-A, which collects patient-level data on individuals entering state-certified substance abuse treatment facilities.[40] We defined MOUD use as planned medication-assisted therapy (a binary variable within TEDS-A representing planned use of methadone, buprenorphine, or naltrexone). Independent variables were chosen based on demographic factors known to be associated with MOUD use, including sex, race (ie, white, black, and all others), age (ie, <25 years, 25-54 years, ≥55 years), referral from the criminal justice system, and veteran status. Data on health insurance status were not included given that more than 60% were missing or invalid.

Data on Medicaid expansion by 2017 were collected from the Henry J. Kaiser Family Foundation.[43] As a subanalysis, states that did or did not have Medicaid prescribing restrictions for buprenorphine and/or XR-NTX (eg, preauthorization requirements, time or dosage limits on buprenorphine) were examined within states that did or did not implement Medicaid expansion; 11 states did not report prescribing restrictions and were excluded from this subanalysis (eTable 1 in the Supplement).

Opioid overdose mortality rates, defined as opioid-involved deaths per 100 000 residents, were collected by states and the District of Columbia from the Centers for Disease Control and Prevention[42]; 16 states were excluded because they did not meet National Institutes of Health reporting criteria[41] (eTable 1 in the Supplement).

Statistical Analysis

The availability of MOUDs (ie, methadone, buprenorphine, XR-NTX, the combination of any 2 MOUDs, and the combination or absence of all MOUDs) for residential facilities reporting to the 2017 N-SSATS and the planned use of any MOUD for admissions to residential treatment facilities reporting to the 2017 TEDS-A were compared via logistic regression analyses and reported as unadjusted odds ratios (ORs) for states that did or did not expand Medicaid as of 2017. To further examine state-level policy factors associated with MOUD use, states that did or did not have Medicaid prescribing restrictions for buprenorphine and/or XR-NTX (eg, preauthorization requirements, time or dosage limits on buprenorphine prescribing) were examined within states that did or did not implement Medicaid expansion.

Sensitivity analyses of patient-level TEDS-A outcomes were performed for results on Medicaid expansion and prescribing restrictions by restricting the MOUD use data to only first-time treatment admissions; propensity score matching MOUD use data based on age, sex, and race; and in a multivariable model controlling for all demographic characteristics.

For facility-level (via the N-SSATS) and admissions-level (via the TEDS-A) factors that might be associated with MOUD availability and use, respectively, unadjusted ORs and adjusted ORs (aORs)

were computed using unadjusted and multivariable logistic regression models. In N-SSATS data, offering no MOUDs was used as the primary dependent variable, with XR-NTX and buprenorphine availability as secondary dependent variables (eTable 2 and eTable 3 in the Supplement); methadone availability was not included in the results because the proportion of facilities offering only methadone was too low to infer meaningful results. In TEDS-A data, planned use of any MOUD was used as the primary dependent variable. In addition to ORs and aORs, percentage probabilities were calculated and are reported in eTable 4, eTable 5, and eTable 6 in the Supplement. In each logistic regression analysis, 28.8% of data were missing in N-SSATS, and 15.4% of data in TEDS-A were missing (Figure 1). Missing data were not imputed. In a subanalysis, ORs were calculated separately for availability of any MOUD within residential facilities (via the N-SSATS) and planned use of any MOUD (via the TEDS-A) as a function of state-level opioid overdose mortality rates in the 34 states (and District of Columbia) that were determined by the National Institutes of Health to have provided accurate overdose mortality rates in 2017 (eTable 1 in the Supplement). All data were analyzed from June to November 2019 using R version 3.6.0 (R Project for Statistical Computing). Statistical significance was set at $P < .05$, and all tests were 2-tailed.
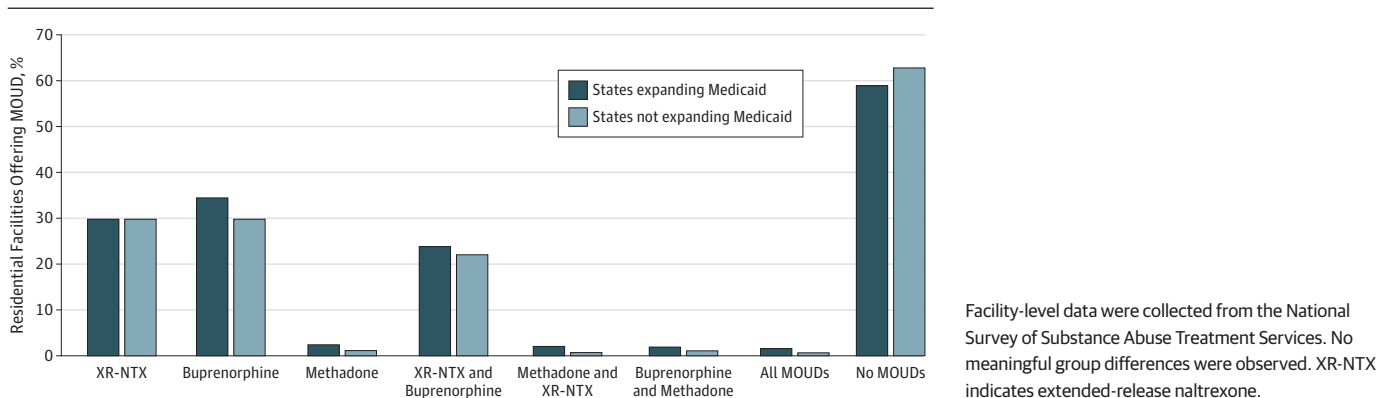
Results

MOUD Availability in Residential Treatment Facilities

Of the 13 585 facilities reporting to the N-SSATS in 2017, only residential treatment facilities within the 50 states and District of Columbia were included (2863 [21.1%]). In 2017, 854 residential treatment facilities (29.8%) offered XR-NTX, 953 (33.3%) offered buprenorphine, and 60 (2.1%) offered methadone. Overall, 1717 residential treatment facilities (60.0%) offered no MOUDs, and only 36 (1.3%) offered all MOUDs (**Figure 2**). The 2095 facilities with complete data generally accepted some form of insurance (1753 [83.7%]), were licensed by a state or hospital authority (1914 [91.4%]), and offered long-term residential treatment (1743 [83.2%]) (**Table 1**). There was no appreciable difference in MOUD availability in residential facilities in states that did or did not expand Medicaid.

Association of State-Level Medicaid Policy With MOUD Use Among Residential Facility Admissions

Of 2 005 395 admissions reported to TEDS-A in 2017, only admissions that identified opioids (ie, heroin, prescription or synthetic opioids, or diverted methadone) as the patient's primary drug of choice and took place at residential treatment facilities within the 50 states or District of Columbia were included in these analyses (232 414 [11.9%]). In 2017, 34 833 patients (15.0%) with OUD had any

Figure 2. Availability of Medications for Opioid Use Disorder (MOUDs) and Combinations of MOUDs in Residential Treatment Facilities, by State Expansion of Medicaid

Facility-level data were collected from the National Survey of Substance Abuse Treatment Services. No meaningful group differences were observed. XR-NTX indicates extended-release naltrexone.

MOUD as part of their treatment plan. Patients admitted to residential facilities had higher odds of planned use of MOUD in states that expanded Medicaid vs did not expand Medicaid by 2017 (34 058 of 192 336 [17.7%] vs 775 of 40 078 [1.9%]; OR, 10.91; 95% CI, 10.15-11.73; Wald χ^2_1 = 4226.32; P < .001). The 205 612 of 232 414 treatment admissions (85.5%) with complete data were predominantly among men (136 854 [66.6%]), white individuals (151 867 [73.9%]), and patients aged between 25 and 54 years (166 213 [80.8%]) (**Table 2**).

A subanalysis was performed for 158 675 admissions within states that reported their prescribing restrictions for Medicaid reimbursement of buprenorphine or XR-NTX. In states that expanded Medicaid and had prescribing restrictions, patients had lower odds of MOUD use than in states that expanded Medicaid and had no prescribing restrictions (2849 of 30 294 [9.4%] vs 19 077 of 100 701 [18.9%]; OR, 0.44; 95% CI, 0.43-0.46; Wald χ^2_1 = 1456.86; P < .001) (**Figure 3**). The same pattern was true in states that did not expand Medicaid; patients had lower odds of MOUD use in states with prescribing restrictions vs those without prescribing restrictions (421 of 24 496 [1.7%] vs 258 of 3184 [8.1%]; OR, 0.20; 95% CI, 0.17-0.23; Wald χ^2_1 = 394.52; P < .001) (Figure 3).

Table 1. Characteristics of Residential Treatment Facilities

Characteristic	No. (%)		Unadjusted OR (95% CI)	Multivariable aOR (95% CI)
	All Residential Facilities (N = 2095)	Offering No MOUD (n = 1300)		
Offered psychiatric medications	1038 (49.5)	356 (34.3)	0.06 (0.05-0.08)[a]	0.08 (0.06-0.10)[a]
Accepted payment methods				
Cash or self-pay	1786 (85.3)	1064 (59.6)	0.46 (0.34-0.60)[a]	0.63 (0.42-0.95)[b]
Medicare	313 (14.9)	194 (62.0)	1.00 (0.78-1.28)	1.00 (0.72-1.38)
Medicaid	967 (46.2)	570 (58.9)	0.78 (0.66-0.93)[c]	1.41 (1.06-1.86)[b]
State-financed insurance	736 (35.1)	423 (57.5)	0.74 (0.62-0.89)[c]	1.44 (1.09-1.91)[b]
Federal military insurance	359 (17.1)	187 (52.1)	0.61 (0.48-0.77)[a]	1.06 (0.77-1.45)
Private insurance	1196 (57.1)	582 (48.7)	0.24 (0.20-0.29)[a]	0.59 (0.42-0.83)[c]
IHS or 638 contract	323 (15.4)	196 (60.7)	0.93 (0.73-1.19)	1.26 (0.92-1.72)
Cash-only facility	342 (16.3)	296 (86.5)	4.80 (3.47-6.64)[a]	2.20 (1.33-3.62)[c]
Licensed by hospital or state authority	1914 (91.4)	1156 (60.4)	0.39 (0.27-0.57)[a]	0.51 (0.31-0.82)[c]
Accredited[d]	1037 (49.5)	491 (47.3)	0.28 (0.23-0.33)[a]	0.56 (0.44-0.70)[a]
Long-term residential treatment offered[e]	1743 (83.2)	1152 (66.1)	2.69 (2.13-3.39)[a]	1.84 (1.37-2.47)[a]

Abbreviations: aOR, adjusted odds ratio; IHS, Indian Health Service; MOUD, medication for opioid use disorder; OR, odds ratio.

[a] P < .001.

[b] P < .05.

[c] P < .01.

[d] Accredited by the Joint Commission of Healthcare Organizations, Commission on Accreditation of Rehabilitation Facilities, the National Committee for Quality Assurance, the Council on Accreditation, or the Healthcare Facilities Accreditation Program.

[e] Long-term was defined as longer than 28 days.

Table 2. Planned Use of Any MOUD Among Admissions for Opioid Use Disorder in Residential Treatment Facilities

Characteristic	No. (%)		Unadjusted OR (95% CI)	Multivariable aOR (95% CI)
	All Admissions (N = 205 612)	Planned Use of Any MOUD (n = 33 377)		
Men	136 854 (66.6)	21 467 (15.7)	0.89 (0.87-0.91)[a]	0.87 (0.85-0.89)[a]
Race				
White	151 867 (73.9)	24 102 (15.9)	1 [Reference]	1 [Reference]
African American or black	19 076 (9.3)	2260 (11.8)	0.71 (0.68-0.75)[a]	0.67 (0.64-0.71)[a]
All others	34 669 (16.9)	7015 (20.2)	1.34 (1.31-1.39)[a]	1.33 (1.29-1.37)[a]
Age, y				
<25	28 842 (14.0)	4376 (15.2)	1 [Reference]	1 [Reference]
25-54	166 213 (80.8)	26 925 (16.2)	1.08 (1.04-1.12)[a]	1.09 (1.05-1.13)[a]
≥55	10 557 (5.1)	2076 (19.7)	1.37 (1.29-1.45)[a]	1.47 (1.39-1.56)[a]
Veteran status, yes	4245 (2.1)	645 (15.2)	0.92 (0.85-1.00)	0.92 (0.85-1.01)
Referral from justice system, yes	23 816 (11.6)	2845 (11.9)	0.67 (0.65-0.70)[a]	0.67 (0.65-0.70)[a]

Abbreviations: aOR, adjusted odds ratio; MOUD, medication for opioid use disorder; OR, odds ratio.

[a] P < .001.

Sensitivity Analyses

First-time OUD treatment admissions (n = 48 164) followed a similar pattern as the larger population. Patients had higher odds of MOUD use in states that expanded Medicaid vs those that did not (4300 of 28 266 [15.2%] vs 302 of 19 898 [1.5%]; OR, 11.64; 95% CI, 10.34-13.10; Wald χ_1^2 = 1656.84; P < .001). Propensity score matching resulted in qualitatively and quantitatively similar results, with higher odds of MOUD use in states that expanded Medicaid compared with those that did not (OR, 13.73; 95% CI, 12.66-14.90; Wald χ^2 = 3992.06; P < .001). Prescribing restrictions also consistently resulted in reduced odds of MOUD use in the propensity score matched data set for states expanding Medicaid (OR, 0.43; 95% CI, 0.38-0.49; Wald χ_1^2 = 167.39; P < .001) and not expanding Medicaid (OR, 0.18; 95% CI, 0.15-0.21; Wald χ_1^2 = 389.60; P < .001).

Facility-Level Factors Associated With MOUD Availability

Compared with residential facilities that offered at least 1 MOUD, those that offered no MOUDs had lower odds of offering psychiatric medications (OR, 0.06; 95% CI, 0.05-0.08; Wald χ_1^2 = 542.09; P < .001), being accredited by a health organization (OR, 0.28; 95% CI, 0.23-0.33; Wald χ_1^2 = 180.91; P < .001), being licensed by a state or hospital authority (OR, 0.39; 95% CI, 0.27-0.57; Wald χ_1^2 = 24.28; P < .001), and accepting private insurance (OR, 0.24; 95% CI, 0.20-0.29; Wald χ_1^2 = 199.64; P < .001), but they had higher odds of being a cash-only facility (OR, 4.80; 95% CI, 3.47-6.64; Wald χ_1^2 = 89.65; P < .001) (Table 1). Compared with residential facilities that did not offer XR-NTX, those that offered XR-NTX had higher odds of also offering buprenorphine (OR, 22.93; 95% CI, 17.95-29.28; Wald χ_1^2 = 630.13; P < .001), methadone (OR, 6.73; 95% CI, 3.33-13.62; Wald χ_1^2 = 28.18; P < .001), and psychiatric medications (OR, 15.12; 95% CI, 11.48-19.92; Wald χ_1^2 = 372.80; P < .001) and being accredited by a health organization (OR, 3.75; 95% CI, 3.05-4.61; Wald χ_1^2 = 156.76; P < .001) (eTable 2 in the Supplement). Compared with residential facilities that did not offer buprenorphine, those that offered buprenorphine had higher odds of also offering XR-NTX (OR, 22.93; 95% CI, 17.95-29.28; Wald χ_1^2 = 630.14; P < .001), methadone (OR, 6.53; 95% CI, 3.17-13.49; Wald χ_1^2 = 25.76; P < .001), and psychiatric medications (OR, 15.00; 95% CI, 11.61-19.38; Wald χ_1^2 = 428.17; P < .001) and being licensed by a hospital or state authority (OR, 2.37; 95% CI, 1.59-3.54; Wald χ_1^2 = 18.11; P < .001). However, they had lower odds of offering long-term residential treatment (OR, 0.36; 95% CI, 0.28-0.45; Wald χ_1^2 = 73.64; P < .001) (eTable 3 in the Supplement).

Patient-Level Factors Associated With MOUD Use

Patients with OUD being admitted to residential facilities had lower odds of using MOUDs as part of their treatment plan if they were male (OR, 0.89; 95% CI, 0.87-0.91; Wald χ_1^2 = 89.98; P < .001), black or African American individuals (OR, 0.71; 95% CI, 0.68-0.75; Wald χ_1^2 = 384.69; P < .001), or

Figure 3. Use of Any Medication for Opioid Use Disorder Among Patients With Opioid Use Disorder Admitted to Residential Facilities in 2017
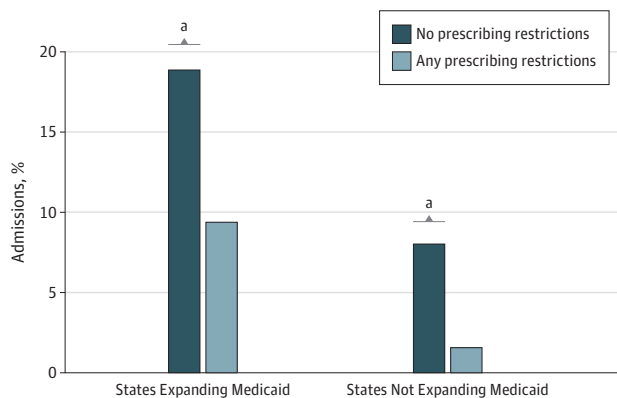
Results are shown for states that did and did not have any prescribing restrictions associated with Medicaid reimbursement for buprenorphine or extended-release naltrexone, within states that did or did not expand Medicaid by 2017. Admission-level data were collected from the Treatment Episode Data Set–Admissions.

a P < .001.

referred from the criminal justice system (OR, 0.67; 95% CI, 0.65-0.70; Wald χ^2_1 = 359.99; P < .001). They had higher odds of MOUD use as part of their treatment plan if they were aged 55 years or older (OR, 1.37; 95% CI, 1.29-1.45; Wald χ^2_1 = 113.29; P < .001) (Table 2).

Association of MOUD Availability and Use With Opioid Overdose Mortality

In a subanalysis of 2276 residential facilities, the odds of offering any MOUD was higher in states with higher opioid overdose fatalities per 1000 residents in 2017 (OR, 1.01; 95% CI, 1.002-1.02; Wald χ^2_1 = 5.55; P = .01). Conversely, in a subanalysis of 197 655 treatment admissions to residential facilities, the odds of planned MOUD use were lower in states with higher opioid overdose fatalities per 1000 residents in 2017 (OR, 0.98; 95% CI, 0.98-0.98; Wald χ^2_1 = 550.32; P < .001).

Discussion

Most residential facilities (ie, 60.0%) in the United States did not offer any Food and Drug Administration–approved MOUDs in 2017 (Figure 2). While states that did and did not expand Medicaid under the Patient Protection and Affordable Care Act did not differ significantly in the availability of MOUDs in residential facilities, patients with OUD being admitted to residential facilities were more likely to have MOUDs as part of their treatment plan in states that expanded Medicaid (17.7%) vs those that did not (1.9%) (Figure 3). Within states that did or did not expand Medicaid, MOUD prescriber restrictions for Medicaid reimbursement were further associated with MOUD use, such that MOUD use was highest in states that expanded Medicaid and had no prescriber restrictions and lowest in states that did not expand Medicaid and had any prescriber restrictions. Importantly, none of the subgroupings of states reported in these analyses had MOUD use in more than 20% of treatment admissions, suggesting that most patients with OUD who were admitted to residential facilities, which are expected to offer a high level of care, did not receive criterion-standard care for OUD treatment.

These findings have clear implications for public health officials regarding the association of state-level Medicaid policy with the use of MOUDs in residential facilities. By the end of 2017, Medicaid covered buprenorphine and XR-NTX but not methadone in all 50 US states, yet there continue to be many nuances in MOUD coverage within states that might further complicate access to treatment.[44] Prescriber restrictions include prior authorization to prescribe buprenorphine or XR-NTX, the requirement that buprenorphine be distributed by an opioid treatment program, or lifetime limits on doses of buprenorphine greater than 8 mg.[43] In addition, American Society for Addiction Medicine criteria play a large role in assigning levels of care to patients with OUD and determining reimbursement for OUD treatment providers.[45] Indeed, the assigned level of care, which is often determined by insurance coverage, is not always in concert with what the patient and/or clinician believe to be appropriate for treatment. The Patient Protection and Affordable Care Act and Mental Health Parity and Addiction Equity Act have aimed to increase access to care, especially in disadvantaged populations,[46] yet state-level restrictions on Medicaid, which also affect private insurance coverage,[47] continue to restrict the treatment community's response to the opioid crisis.

The results of the facility-level analyses indicate that there was an association between the licensing and accreditation of residential treatment facilities and MOUD availability. For example, facilities that did not offer any MOUDs had lower odds of being licensed by a hospital or state authority or being accredited by a health organization than facilities that offered at least 1 MOUD, and facilities that offered XR-NTX or buprenorphine had higher odds of being licensed by a hospital or state authority or being accredited by a health organization. Collectively, these data suggest that policy efforts focused on increasing MOUD availability in residential facilities through the licensing and accreditation process could quickly improve care for individuals with OUD. Individuals who are misusing opioids and are not yet in treatment have reported positive views of both residential facilities and MOUDs,[19] and public health efforts to improve adoption of MOUDs in residential

facilities might increase the number of individuals with OUD who are initiated into long-term, meaningful recovery.

Both facility-level and admission-level data suggest that MOUD availability and use may be lacking for disadvantaged populations, given that residential facilities that did not offer any MOUDs had higher odds of accepting cash-only payments than those that offered at least 1 MOUD (Table 1), and black patients as well as those who were referred from the criminal justice system had lower odds of receiving MOUDs as part of their treatment plan. This is concerning given recent evidence suggesting that these groups derive substantial benefits from the use of MOUDs.[48,49] Policy efforts that remove barriers to MOUD prescribing and require the availability of MOUDs for Medicaid recipients could be used to increase the use of these treatments. In addition, sex/gender and age are important factors to consider in MOUD induction and maintenance.[50-52] Harnessing the expertise of medical professionals (eg, physicians, nurses), behavioral specialists (eg, psychologists, counselors, social workers), and peer recovery specialists (eg, individuals in recovery) to work in concert across the continuum of residential and outpatient care could better address the complex problems that arise in early recovery and improve the long-term trajectory of individuals with OUD.

A previous study on the availability of MOUDs in outpatient facilities[33] reported an association between increased MOUD availability and increased opioid overdose mortality; the current study extends this finding, given that residential facilities in states reporting higher rates of opioid overdose mortality had higher odds of offering any MOUD. At the same time, the use of MOUDs in treatment admissions at residential facilities was lower in states with higher opioid overdose mortality. The opioid overdose epidemic continues, especially in geographic areas where poverty is rampant and heroin or fentanyl are widely available,[53-55] and macrolevel initiatives will be necessary to deliver care to these highly affected communities. The current study provided evidence that MOUD availability and use is uncommon within most residential substance use disorder facilities, similar to reports from outpatient substance use disorder facilities.[33] Residential facilities are expected to offer a transient but very high level of care, and their model of direct patient supervision could provide an ideal opportunity for individuals with OUD to be inducted to MOUDs before transitioning to outpatient care.[33,34,56]

Limitations

This study has several limitations. The N-SSATS only reported data on residential facilities reporting to the Substance Abuse and Mental Health Services Administration; however, it is the largest database of US residential substance use disorder facilities. It is unknown whether facilities reporting to the N-SSATS refer patients to off-site medical professionals for MOUD prescribing, but the planned use of any MOUD for treatment (via the TEDS-A) suggested that most patients in residential treatment did not receive MOUDs. The TEDS-A reports on planned use of any MOUD (as a single binary variable) for treatment admissions, and persons with OUD could account for more than 1 admission per year. This study used all OUD admissions to gain insight on total planned MOUD use in residential facilities. In addition, there are nuances within state-level Medicaid coverage of MOUDs that were beyond the scope of this article; future studies could examine state-level barriers to specific MOUD options to further elucidate the association of policy with medical treatment of OUD. There are also philosophical differences in MOUD prescribing that are not captured by the data sources used in this study but should be examined more thoroughly via clinician surveys and focus groups.

Conclusions

This study found that most residential treatment facilities in the United States did not offer any MOUDs in 2017 and that the use of MOUDs in residential settings is especially lacking in states that have been resistant to Medicaid expansion under the Patient Protection and Affordable Care Act as well as in states with MOUD prescribing restrictions for Medicaid reimbursement. There are several

factors that might have prevented residential facilities from offering MOUDs, including legal and regulatory barriers associated with buprenorphine or methadone prescribing, variability in insurance reimbursement, and the lack of integration between paraprofessionals and clinicians. Given that the United States is in the midst of a deadly and protracted opioid crisis, public health efforts should focus on bridging the gap between residential treatment facilities with deep knowledge of behavioral interventions and medical professionals who can provide MOUDs to improve the trajectory of long-term recovery for individuals with OUD. The data presented here suggest that Medicaid expansion and the relaxation of MOUD prescribing restrictions for Medicaid reimbursement could improve MOUD availability and use in residential facilities.

ARTICLE INFORMATION

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SUPPLEMENT.

eTable 1. State-Level Differences in Opioid Overdose Mortality, Medicaid Expansion, and MOUD Prescribing Restrictions for Medicaid Reimbursement

eTable 2. Characteristics of Residential Treatment Facilities Offering Extended-Release Naltrexone

eTable 3. Characteristics of Residential Treatment Facilities Offering Buprenorphine

eTable 4. Unadjusted Predicted Probabilities for Residential Facility Models

eTable 5. Adjusted Predicted Probabilities for Residential Facility Models

eTable 6. Unadjusted and Adjusted Predicted Probabilities for Treatment Admissions Models