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Adolescent-Serving Addiction Treatment Facilities in the United States and the Availability of Medications for Opioid Use Disorder

Rachel H. Alinsky, MD, MPH^a, Scott E. Hadland, MD, MPH, MS^{b,c}, Pamela A. Matson, MPH, PhD^a, Magdalena Cerda, DrPH, MPH^d, Brendan Saloner, PhD^e

^aJohns Hopkins School of Medicine, Division of General Pediatrics and Adolescent Medicine, 200 North Wolfe Street, Baltimore, MD 21287

^bDepartment of Pediatrics / Grayken Center for Addiction, Boston Medical Center, 850 Harrison Ave., Boston, MA, 02118

^cBoston University School of Medicine, Division of General Pediatrics, Department of Pediatrics, 88 East Newton Street, Vose Hall Room 322, Boston, MA, 02118

^dCenter for Opioid Epidemiology & Policy, Department of Population Health, New York University School of Medicine, 180 Madison Avenue, New York, NY 10016

^eJohns Hopkins Bloomberg School of Public Health, Department of Health Policy and Management, 624 N. Broadway, Baltimore, MD 21205

Abstract

Purpose—Adolescents with opioid use disorder are less likely than adults to receive medication for opioid use disorder (MOUD), yet we know little about facilities that provide adolescents addiction treatment. We sought to describe adolescent-serving addiction treatment facilities in the US and examine associations between facility characteristics and offering MOUD, leading to informed recommendations to improve treatment access.

Methods—This cross-sectional study used the 2017 National Survey of Substance Abuse Treatment Services. Facilities were classified by whether they offered a specialized adolescent program. Covariates included facility ownership, hospital affiliation, insurance/payments, government grants, accreditation/licensure, location, levels of care, and provision of MOUD.

Send correspondence to: Rachel H. Alinsky, MD, MPH, Division of General Pediatrics and Adolescent Medicine, Johns Hopkins School of Medicine, 200 North Wolfe Street, Baltimore, MD 21287, **Phone:** 314-368-6618, **Fax:** 410-367-2907, RAlinsk1@jhmi.edu. Contributors

Dr. Alinsky had full access to all the data in the study and undertook data management. Drs. Alinsky and Saloner designed the study and wrote the protocol for analysis with additional input from Drs. Hadland, Matson, and Cerda. Dr. Alinsky conducted statistical analyses with input from Dr. Saloner. All authors were involved in interpretation of results. Dr. Alinsky conducted the literature review and wrote the first draft of the manuscript. All authors contributed to and have approved the final manuscript.

Conflict of Interest Statement

The authors have no conflicts of interest to disclose.

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Descriptive statistics and logistic regression compared adolescent-serving versus adult-focused facilities, and identified characteristics associated with offering maintenance MOUD.

Results—Among 13,585 addiction treatment facilities in the US, 3,537 (26.0%) offered adolescent programs. Adolescent-serving facilities were half as likely to offer maintenance MOUD as adult-focused facilities (odds ratio, 0.53; 95% confidence interval, 0.49–0.58), which was offered at 23.1% (816) of adolescent-serving versus 35.9% (3,612) of adult-focused facilities. Among adolescent-serving facilities, characteristics associated with increased unadjusted odds of offering maintenance MOUD were non-profit status, hospital affiliation, accepting insurance (particularly, private insurance), accreditation, Northeastern location, or offering inpatient services.

Conclusions and Relevance—The one-quarter of US addiction treatment facilities that serve adolescents are half as likely to provide MOUD as adult-focused facilities, which may explain why adolescents are less likely than adults to receive MOUD. Strategies to increase adolescent access to MOUD may consider insurance reforms/incentives, facility accreditation, and geographically-targeted funding.

Keywords

Opioid Use Disorder; Adolescent; Treatment Facilities; Adolescent Health Services; Substance Abuse Treatment Centers; Medication for addiction treatment; Medication for opioid use disorder; Medication-assisted treatment

INTRODUCTION

Amid rising rates of opioid use disorder (OUD) and opioid overdose,^{1–5} adolescents remain a group with persistently poor access to treatment for OUD. Despite the evidence-based recommendation that adolescents with OUD receive treatment that includes medication for opioid use disorder (MOUD),⁶ multiple studies have demonstrated that youth with OUD or who experience opioid overdose are less likely than adults to receive this standard-of-care treatment. In 2014–2015, less than 5% of Medicaid-enrolled adolescents under age 18 who were diagnosed with OUD received timely MOUD, compared to 26.9% of young adults.⁷ Commercially-insured youth under age 18 have similarly low receipt of MOUD.⁵ And while 16% of adults receive MOUD within one month of opioid overdose,⁸ only 1.8% of youth receive MOUD.⁹ Even among youth who are able to access the addiction treatment system, receipt of MOUD is uncommon, with adolescents in subspecialty treatment for OUD being one-tenth as likely as adults to receive MOUD.¹⁰

This disparity in access to treatment for adolescents may substantially exacerbated by the paucity of treatment facilities willing to accept youth and/or provide MOUD. This limited access, in turn, likely reflects both structural barriers and the culture of addiction treatment. To our knowledge there have been no peer-reviewed studies in the last decade examining the characteristics of adolescent-serving addiction treatment facilities as a subset of addiction treatment facilities. Thus, the extent to which addiction treatment facility availability and characteristics contribute to the differential access to MOUD and resultant health inequities for youth is unknown.

This study sought to fill this gap in knowledge, allowing for better understanding of how treatment facility characteristics impact adolescent access to services. Using data from a comprehensive national survey of US addiction treatment facilities, this study's objectives were to (1) describe the quantity and characteristics of adolescent-serving facilities, and (2) examine associations between facility characteristics and offering maintenance MOUD, leading to informed recommendations to improve treatment access.

METHODS

Study Design and Setting

This cross-sectional study used data from the 2017 National Survey of Substance Abuse Treatment Services (N-SSATS),¹¹ the most recent year of data available at the time of analysis. N-SSATS is an annual survey conducted by the Substance Abuse and Mental Health Services Administration “to collect data on the location, characteristics, and use of alcohol and drug abuse treatment facilities and services throughout the 50 states, the District of Columbia, and other jurisdictions.”¹² The 2017 N-SSATS had a response rate of 89% (13,857 of 15,528 eligible facilities); after exclusion of non-treatment halfway houses, solo practitioners, and facilities serving only incarcerated individuals, ultimately 87% of the facilities (13,585) were included in the final N-SSATS data.¹² Data were collected between February and December of 2017,¹² with the results publicly available in 2018.¹¹ All 13,585 facilities that completed the survey and were included in the final report were analyzed in this study. Study analyses were conducted between January and August 2019. The study was not considered human subjects research by the Johns Hopkins Bloomberg School of Public Health Institutional Review Board.

Study Variable Construction

Facilities were stratified into two mutually exclusive categories by whether they reported offering a specialized program for adolescents. Facilities that self-reported offering a program for adolescents were designated “adolescent-serving,” and facilities without such a program were designated “adult-focused.” The age range for “adolescents” was not specified in the N-SSATS survey, though typically has been considered to be youth under age 18.

Additional facility characteristic covariates included facility ownership (for-profit, non-profit, state/local/tribal government, federal government), hospital affiliation, insurance/ payments accepted, acceptance of government grants, accreditation/licensure (by either a state/hospital authority, or a national authority), and location. The categories of payments accepted were condensed to five non-mutually exclusive categories: accepting private insurance, accepting Medicaid, accepting other public insurance (including Medicare, state-financed insurance other than Medicaid, federal military insurance, or Indian Health Service care), offering free or reduced fees (sliding scale or free for those who cannot pay), or accepting only cash/self-pay. The facility location was categorized by state and US census region. For the calculation of odds ratios, a reference category was used for facility ownership and for location. The reference category for facility ownership was private for-profit (thus the odds ratios compare the odds of each other ownership type having the outcome compared to the odds of a private for-profit having the outcome). Similarly for

location, northeast US census region was the reference category. For all other odds ratios, the reference category is a facility without that particular characteristic (ie. hospital-affiliated versus not hospital-affiliated; accepting private insurance versus not accepting private insurance).

Facility services covariates included levels of care provided and offering MOUD. Levels of care as defined by the American Society of Addiction Medicine (ASAM) criteria¹³ were condensed into three variables: inpatient services, residential services, and outpatient services. Facilities reported whether they offered MOUD, and if so, which specific medications, and under what circumstances. A facility was designated as “offering MOUD” if they reported using any of the three US Food & Drug Administration-approved MOUDs (methadone, buprenorphine, extended-release naltrexone) for any circumstance (maintenance, detoxification, or withdrawal after a pre-determined time). Limiting the sample to facilities who reported offering MOUD, facilities were further characterized by types of medication and provision of maintenance versus detoxification only. Facilities were designated as offering “only antagonist MOUD” if they offered only naltrexone (without buprenorphine or methadone). Facilities were designated as offering “any maintenance MOUD” if they reported using any of the three MOUDs for maintenance therapy. Facilities were designated as offering “opioid agonist maintenance MOUD” if they provided either buprenorphine or methadone maintenance. Facilities were designated as offering “only short term opioid agonist MOUD” if they reported using buprenorphine or methadone only for detoxification or required MOUD discontinuation after a pre-determined time.

Statistical Analysis

Descriptive statistics and chi-square tests were used to compare characteristics and services between adolescent-serving and adult-focused facilities. Simple logistic regression was used to identify facility characteristics associated with offering a program for adolescents.

Stratifying by whether the facility was adolescent-serving or adult-focused, descriptive statistics were used to describe characteristics of facilities offering maintenance MOUD. Logistic regression was performed to identify characteristics associated with offering maintenance MOUD; an interaction term was used to test whether the facility characteristic associated with offering MOUD differed between adolescent-serving and adult-focused facilities. No additional analyses were performed for interactions found to be significant, as the goals of these main analyses were to describe the associations as they exist in this near universal representation of treatment facilities, rather than adjust for multiple associations in a sample of facilities. As a sensitivity analysis, multivariable logistic regression was performed (presented in Appendix B) including all covariates selected *a priori*; we calculated variance inflation ratios to check for collinearity. The stratified multivariable model with all covariates was used to provide regression-adjusted probabilities for the availability of maintenance MOUD (Appendix C).

Last, the association between state-level availability of maintenance MOUD for youth versus adults was examined by creating a scatterplot of the proportion of adolescent-serving facilities per state that offer maintenance MOUD versus the proportion of adult-focused

facilities per state that offer maintenance MOUD, and calculating a weighted correlation coefficient.

Analyses were conducted using STATA IC Version 15 (StataCorp, College Station, TX). The scatterplot was generated using Microsoft Excel 2016 (Microsoft Corporation, Redmond, WA). All statistical tests were two-sided and considered significant at $p < 0.05$.

RESULTS

Characteristics Associated with Adolescent Programs

Of 13,585 total facilities included in the 2017 N-SSATS, 3,537 (26.0%) reported offering a program for adolescents (“adolescent-serving facilities”); the remaining 10,048 (74.0%) facilities did not offer programs for adolescents (“adult-focused facilities”). Table 1 displays characteristics of the overall sample of all adolescent-serving and adult-focused facilities. Adolescent-serving facilities were more likely than adult-focused facilities to be owned by a non-profit or state/local/tribal government, accept insurance or offer free & reduce services, or receive government grants. Conversely, adult-focused facilities were more likely than adolescent-serving facilities to be owned by a for-profit or the federal government, be affiliated with a hospital, accept cash only, or be accredited by a national authority.

Table 2 displays services offered by the overall sample of all adolescent-serving and adult-focused facilities. Among the 3,537 adolescent-serving facilities, 23.1% (816, or 6% of all 13,585 facilities in the US) offered maintenance MOUD, compared to 35.9% (3,612) of adult-focused facilities (odds ratio [OR], 0.53; 95% confidence interval [CI], 0.49–0.58). While adolescent-serving and adult-focused facilities were equally likely to offer the opioid antagonist naltrexone as their only MOUD (OR, 0.92; 95% CI, 0.79–1.08), adolescent-serving facilities were approximately half as likely to offer opioid agonist maintenance MOUD (OR, 0.51; 95% CI, 0.46–0.57), with only 15% (531) of adolescent-serving facilities offering this compared to 25.6% (2,574) of adult-focused facilities. Of adolescent-serving facilities, 92.4% (3,267) offered outpatient treatment, 11.7% (413) offered residential treatment, and 3.6% (129) offered inpatient treatment.

Characteristics Associated with offering Maintenance MOUD

Table 3 shows characteristics of facilities that offer maintenance MOUD stratified by whether they were adolescent-serving or adult-focused; this table displays the number and percent of facilities with each characteristic, and the unadjusted odds ratio for offering maintenance MOUD by each characteristic. Table 3 also shows the p-value testing for a difference in this association between adult versus adolescent facilities, derived from an interaction term in an unadjusted logistic regression model (see Appendix A) that included separate terms for adolescent-serving, the particular characteristic, and their interaction. Facility ownership type was significantly associated with the odds of providing maintenance MOUD, and this relationship significantly differed between adolescent-serving and adult-focused facilities: among adolescent-serving facilities, non-profits were 1.4 times more likely (OR, 1.37; 95% CI, 1.14–1.63) than for-profits to offer maintenance MOUD, whereas among adult-focused facilities, non-profits were approximately half as likely (OR, 0.58;

95% CI, 0.53–0.63) as for-profits to offer maintenance MOUD. Hospital-affiliation was associated with increased odds of offering maintenance MOUD in both adolescent-serving facilities (OR, 3.55; 95% CI, 2.72–4.65) and adult-focused facilities (OR, 2.45; 95% CI, 2.15–2.79), though the relationship was stronger among adolescent-serving facilities. Facilities that accepted any kind of insurance, particularly private insurance, were significantly more likely to provide maintenance MOUD than those not accepting insurance, or those offering free and reduced fee services. Adolescent-serving facilities that were certified, licensed, or accredited by a state/hospital, or a national authority were more likely to offer maintenance MOUD than unaccredited facilities; the association of national accreditation with offering maintenance MOUD was even stronger among adult-focused facilities. Both adolescent-serving and adult-focused facilities in the Midwest, South, and West were less likely to provide maintenance MOUD versus facilities in the Northeast; this negative association was strongest among adolescent-serving facilities in the South and West. Lastly, adolescent-serving facilities offering inpatient services were more likely (OR, 3.59; 95% CI, 2.52–5.12) to offer maintenance MOUD than facilities without this level of care; this association held but was less strong among adult-focused facilities (OR, 1.76; 95% CI, 1.49–2.08).

Appendix B displays the results of the sensitivity analysis demonstrating adjusted odds ratios for offering maintenance MOUD by facility characteristic; the results are substantially similar to the unadjusted model with the exception of a change in the coefficient for cash & self-pay adolescent-serving facilities. Checks for collinearity were negative, with all variance inflation ratios under 2.5. Appendix C demonstrates the regression-adjusted percent of facilities offering maintenance MOUD by facility characteristic. This table demonstrates that after adjusting for all facility characteristics, 35.3% (95% CI, 34.4%–36.2%) of adult-focused facilities provide maintenance MOUD versus 22.8% (95% CI, 21.3%–24.3%) of adolescent-serving facilities, similar to percentages in the unadjusted analyses.

State-Level Availability of Maintenance MOUD

Figure 1 displays a scatterplot of the percent of facilities with versus without adolescent programs that offer maintenance MOUD by state and US census region ($R^2 = 0.4676$). Most Northeast states (8 of 9; 89%) were clustered in the top-right quadrant with the highest percentages of both adolescent- and adult-serving facilities providing maintenance MOUD. Conversely, most Midwest (7 of 12; 58%) and Southern states (15 of 17; 88%) and all Western states (13 of 13; 100%) fell above the line of symmetry, with a higher percent of adult-focused facilities offering maintenance MOUD in these states compared to adolescent-serving facilities.

DISCUSSION

In this comprehensive study of 13,585 US addiction treatment facilities, only one-quarter offered programs for adolescents in 2017. Of these adolescent-serving facilities, only 3.6% and 11.7% offered inpatient or residential services, respectively. Adolescent-serving facilities were half as likely as adult-focused facilities to offer any maintenance MOUD, with only 6% of all U.S. facilities offering both programs for adolescents and maintenance

MOUD. Among adolescent-serving facilities, characteristics associated with increased unadjusted odds of offering maintenance MOUD were non-profit status, hospital-affiliation, accepting insurance (particularly, private insurance), accreditation, Northeast location, or offering inpatient services.

This study contributes several key findings and possible targets for policy approaches. First, to our knowledge this study is the first in the last decade to fully describe the paucity of addiction treatment facilities available to adolescents throughout the US. Youth who require a higher level of care (residential or inpatient services) based on the ASAM treatment criteria guidelines¹³ may not be able to access such services given the limited number of adolescent-serving treatment facilities, with only 413 residential facilities for youth in the US versus 2712 residential facilities for adults. Priority investment in increasing the number of beds for youth may be necessary to improve access to higher levels of care for adolescents.

Second, this study demonstrates that in addition to the relatively few treatment facilities available for adolescents, it may be even harder for youth to access MOUD because adolescent-serving facilities are half as likely to offer MOUD as adult-focused facilities. While prior literature has explored the availability of MOUD throughout the country, to our knowledge, this is the first study specifically examining how this may differ among adolescent-serving facilities. The patterns of poor MOUD availability in adolescent-serving facilities found in this study is likely the result of combined societal and financial factors. Beliefs against using medication have been able to persist due to the longstanding separation of addiction treatment from mainstream medicine resulting in a tension between a medical model of illness versus a recovery model.¹⁴⁻¹⁷ This widespread stigma against MOUD within the healthcare and recovery communities sometimes results in MOUD being inaccurately viewed as “replacing one drug with another,”¹⁴ with a failure to recognize the chronic illness nature of OUD and the substantial effectiveness of medication.¹⁴⁻¹⁷ This stigma may be even stronger regarding prescribing adolescents MOUD, where a common view is that “medications should be used as a last resort,”¹⁷ despite evidence-based guidelines from the American Academy of Pediatrics that recommend its use.⁶ The bias against prescribing opioid agonists (buprenorphine and methadone) in particular to adolescents may be evidenced by adolescent-serving facilities being half as likely as adult-focused facilities to offer opioid agonists, yet equally likely to offer only the opioid-antagonist naltrexone. While it is unclear from this study whether these facilities are actually providing naltrexone to adolescents, the irony is that naltrexone is not FDA-approved for adolescents under 18 due to insufficient pediatric data.¹⁸ Anti-MOUD views may be impacting the availability of MOUD both through individual facilities choosing to not offer MOUD, or through wider state-level policymaking and Medicaid restrictions.¹⁹ Moreover, there is an insufficient number of youth-serving MOUD prescribers, with only a small number of pediatricians waived to prescribe buprenorphine;²⁰ this could be improved by targeting youth-serving providers in educational and stigma-reduction campaigns as well as federal funding efforts to train MOUD providers.^{21,22}

Third, this study suggests several underlying financial and reimbursement-based factors that may be contributing to the availability of MOUD, which may also stem from the

fragmentation of behavioral health service financing from other medical services.¹⁶ Some of the associations found in this study were universal to both adolescent-serving and adult-focused facilities, including the increased likelihood of MOUD provision among facilities that were hospital-affiliated, licensed/certified/accredited, or accepted insurance. Prior studies not distinguishing between adolescent-serving and adult-focused facilities found similar associations of MOUD being more common among facilities that were hospital-affiliated, accredited, or accepted insurance, and less common among those offering free/reduced-fee services.^{23,24}

It is thus useful to know that these associations remain true among adolescent-serving facilities, such that broad-based policy approaches designed to target these associations could also benefit adolescents. The positive association of accreditation with MOUD has led to the recommendation that licensing/accreditation can be leveraged as tools to increase facility provision of evidence-based MOUD through quality improvement initiatives, incentivizing innovation, and standard-setting.²⁴ Regarding the role of insurance, substantial research has been performed specifically evaluating the role of Medicaid in the availability of MOUD. Many state Medicaid plans have medication restrictions and utilization controls such as requirements for prior authorizations, or “fail-first” restrictions that require proof of a patient having failed other therapies before approving medications.^{25,26} Multiple studies have demonstrated that facilities located in states with more stringent Medicaid restrictions/utilization controls are less likely to accept Medicaid,²⁷ and those that do accept Medicaid are less likely to offer MOUD than facilities in states with more comprehensive Medicaid coverage.^{19,23} Facilities may view these Medicaid or private insurance restrictions and procedures as too great a barrier and an unprofitable process, and thus may choose to not offer MOUD.¹⁹ These strong associations demonstrate that state-level Medicaid policies may have a substantial impact upon facilities’ choices regarding services offered; liberalizing restrictions might result in significant improvement in the availability of MOUD.^{24,27} Access to MOUD for youth with Medicaid could be improved by including MOUD in the early periodic screening, detection, and treatment (EPSDT) benefits that all state Medicaid plans must cover.^{10,28}

This study also elucidates important differences between the adolescent-serving and adult-focused facilities. While prior studies have found greater MOUD prescribing among for-profit facilities compared to non-profits,^{23,24} this study demonstrates that this association holds true only among adult-focused facilities, whereas among adolescent-serving facilities, non-profits were more likely than for-profits to offer MOUD. Similarly, while cash-only adolescent-serving facilities are less likely to provide MOUD, cash-only adult-focused facilities are more likely to provide MOUD. Future research should seek to understand this difference in the apparent profitability of MOUD in order to inform strategies to improve youth access to MOUD, which may include ensuring parity in insurance reimbursement for all ages, and lifting fail-first restrictions on certain medications for youth.

Lastly, this study points to several key disparities for certain youth with OUD in accessing care. Because facilities that offer free and reduced fee services are less likely to provide MOUD, adolescents who are uninsured or underinsured face even poorer access to MOUD than other youth. This inequity leaves some of the most vulnerable youth unable to receive

the care they need, or might be able to get with more financial resources. This raises concern for violation of the fundamental right of all to the “highest attainable standard of health and to facilities for the treatment of illness” as described in the United Nations Convention on the Rights of the Child.²⁹ Similarly, the inequality in MOUD provision among Northeastern states compared to Southern, Midwestern, and Western states is striking: facilities in Southern states are 80% less likely than Northeastern facilities to provide medication. This geographic variation observed is congruent with what has been previously described in the literature regarding overall access to MOUD, with many counties (particularly rural counties) in the Midwest and South having no available Medicaid-accepting MOUD providers or facilities.³⁰ Thus it may be necessary to target these specific areas of the country for priority funding, insurance reforms, recruitment of youth-serving addiction providers, and incorporation of adolescent-friendly services³¹ at traditionally adult-focused facilities.

Limitations

There were several limitations to this study. First, while the N-SSATS represents a near universal capture of treatment facilities throughout the U.S., it does not include office-based provision of buprenorphine, and thus likely underestimates the full availability of MOUD.²³ However, given that only a small number of pediatricians are waived to prescribe buprenorphine,²⁰ the number of adolescent-serving office-based MOUD providers not included in N-SSATS is likely very small.²² Second, N-SSATS is a self-report survey, thus there is no external verification of the answers provided by the addiction treatment facilities regarding their characteristics and the services they offer. It is possible that facilities reporting the provision of MOUD may not in fact offer these services, or do so only rarely; the same is possible for other services such as offering programs for adolescents. Thus these findings likely represent a more optimistic view than what is available in reality.

CONCLUSION

This large study of addiction treatment centers throughout the US demonstrates that adolescents have less access than adults to standard-of-care addiction treatment, and specifically to inpatient or residential levels of care, or to MOUD. This is especially true of adolescents who rely on free and reduced fee services, or who live in the US South and West. This study may explain why adolescents are considerably less likely than adults to receive MOUD by demonstrating that the few facilities that serve them are significantly less likely to provide MOUD. Based on the results of this study, strategies to increase access to addiction treatment to youth may consider possible mechanisms including insurance reforms and incentives, facility accreditation, and geographically-targeted funding.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Abbreviations

OD	Opioid Use Disorder
MOUD	Medications for Opioid Use Disorder
N-SSATS	National Survey of Substance Abuse Treatment Services
ASAM	American Society of Addiction Medicine

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IMPLICATIONS AND CONTRIBUTIONS

1 in 4 addiction treatment facilities in the US serve adolescents <18 years. Compared to facilities that only offer adult services, adolescent-serving facilities were half as likely to provide medications for opioid use disorder (MOUD), likely contributing to why adolescents are less likely than adults to receive MOUD.

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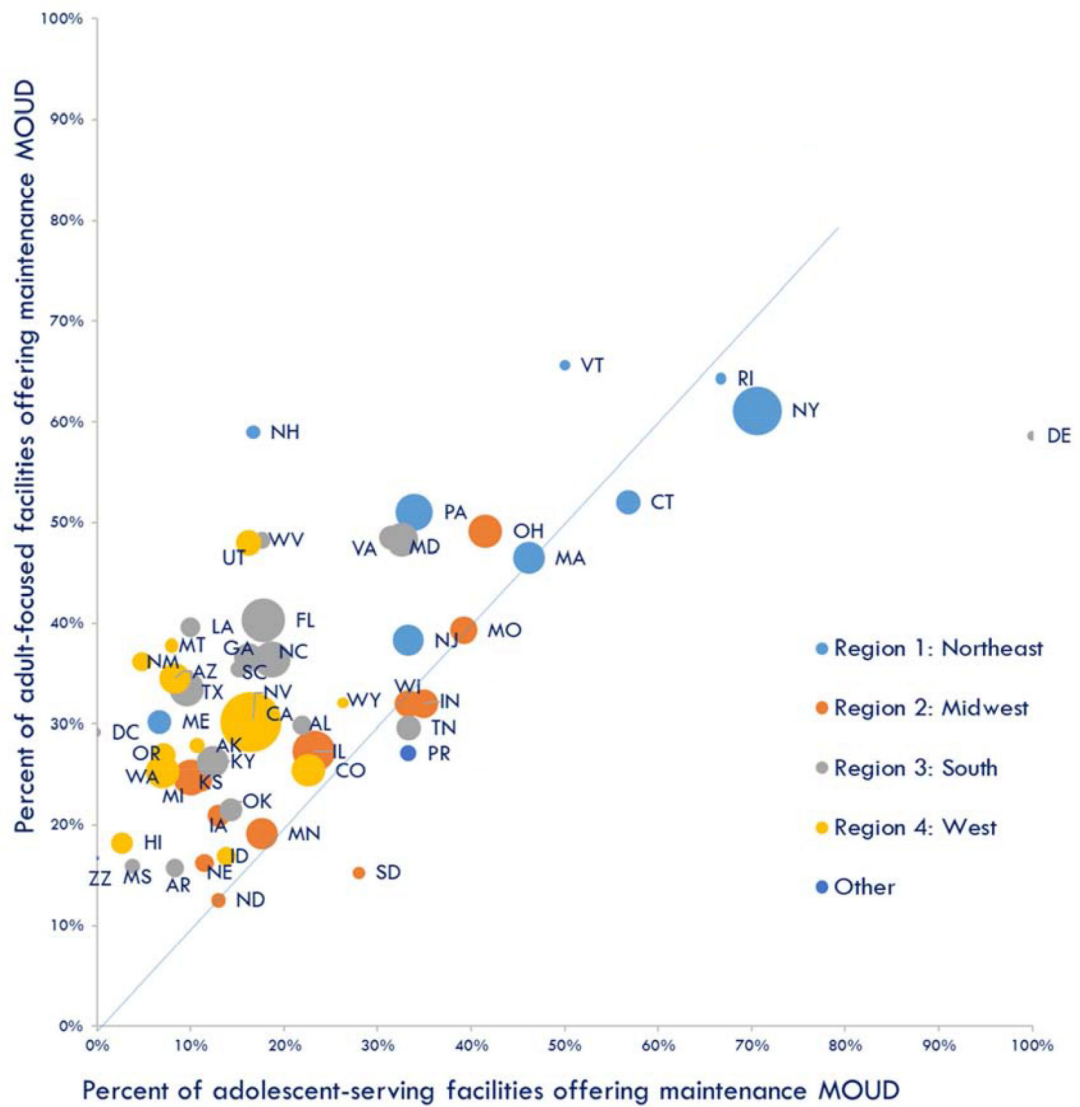


Figure 1. Scatterplot of the percent of adolescent-serving vs adult-focused facilities that offer maintenance medication for opioid use disorder (MOUD), by state.

* Size of dots proportional to number of facilities per state

* The 45 degree line represents the line of symmetry; states that fall above this line have a higher percentage of adult-serving facilities that offer MOUD than youth-serving facilities

Table 1.

Characteristics of overall sample of 13,585 adult-focused and adolescent-serving facilities

Characteristic	Adult-focused facilities N (Column %)	Adolescent-serving facilities N (Column %)	<i>p</i> value	OR ^a for offering program for adolescents (95% CI)
All facilities	10048 (74.0%)	3537 (26.0%)		
Facility ownership				
Private for-profit	3790 (37.7%)	1141 (32.3%)	<0.001	<i>Ref</i>
Private non-profit	5169 (51.4%)	1994 (56.4%)		1.28 (1.18, 1.39)
State/local/tribal gov	813 (8.1%)	389 (11.0%)		1.59 (1.38, 1.82)
Federal gov	276 (2.7%)	13 (0.4%)		0.16 (0.09, 0.27)
Hospital-affiliated	1040 (10.4%)	235 (6.6%)	<0.001	0.62 (0.53, 0.71)
Payment/insurances accepted				
Private insurance	6786 (68.6%)	2745 (78.5%)	<0.001	1.67 (1.52, 1.83)
Medicaid	6045 (61.3%)	2640 (75.5%)	<0.001	1.94 (1.78, 2.12)
Other public insurance	6108 (61.2%)	2571 (73.1%)	<0.001	1.72 (1.58, 1.87)
Free & reduced fees	6926 (68.9%)	2812 (79.5%)	<0.001	1.75 (1.60, 1.92)
Cash & self-pay only	597 (5.9%)	53 (1.5%)	<0.001	0.24 (0.18, 0.32)
Accepts government grants	5130 (53.1%)	2108 (61.7%)	<0.001	1.42 (1.31, 1.54)
Certification, licensing, or accreditation				
By state/hospital authority	9020 (89.8%)	3153 (89.1%)	0.29	0.94 (0.83, 1.06)
By national authority	5226 (52.0%)	1703 (48.1%)	<0.001	0.86 (0.79, 0.93)
US census regions				
1 : Northeast	2021 (20.1%)	584 (16.5%)	<0.001	<i>Ref</i>
2: Midwest	2426 (24.1%)	862 (24.4%)		1.23 (1.09, 1.39)
3: South	2993 (29.8%)	990 (28.0%)		1.14 (1.02, 1.29)
4: West	2517 (25.0%)	1088 (30.8%)		1.50 (1.33, 1.68)
Other/territories	91 (0.9%)	13 (0.4%)		0.49 (0.27, 0.89)

^aOdds Ratio reference category for facility ownership type was private for-profit status (thus the odds ratios are the odds of each other ownership type offering an adolescent program compared to the odds of a private for-profit offering a program for adolescents). Similarly for US census regions, northeast location was the reference category. For all other odds ratios, the reference category is a facility without that particular characteristic (ie. hospital-affiliated vs. not hospital-affiliated; accepting private insurance vs. not accepting private insurance).

Table 2.

Services offered at 13,585 adult-focused and adolescent-serving facilities

Service Offered	Adult-focused facilities N (Column %)	Adolescent-serving facilities N (Column %)	<i>p</i> value	OR ^a for offering program for adolescents (95% CI)
All facilities	10048 (74.0%)	3537 (26.0%)		
Medications offered				
Offers any MOUD ^b	4474 (44.5%)	1009 (28.5%)	<0.001	0.50 (0.46, 0.54)
Offers only short term opioid agonist MOUD ^b	610 (6.1%)	106 (3.0%)	<0.001	0.48 (0.39, 0.59)
Offers any maintenance MOUD ^b	3612 (35.9%)	816 (23.1%)	<0.001	0.53 (0.49, 0.58)
Offers opioid agonist maintenance MOUD ^b	2574 (25.6%)	531 (15.0%)	<0.001	0.51 (0.46, 0.57)
Offers only antagonist MOUD ^b	698 (6.9%)	228 (6.4%)	0.31	0.92 (0.79, 1.08)
Levels of care				
Inpatient services	586 (5.8%)	129 (3.6%)	<0.001	0.61 (0.50, 0.74)
Residential services	2712 (27.0%)	413 (11.7%)	<0.001	0.36 (0.32, 0.40)
Outpatient services	7917 (78.8%)	3267 (92.4%)	<0.001	3.26 (2.85, 3.72)

^aOdds Ratio reference category is a facility without that particular characteristic (ie. facility offering any MOUD vs. facility not offering any MOUD; facility offering inpatient services vs. facility not offering inpatient services).

^bMedication for Opioid Use Disorder (MOUD)

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Table 3.

Number and percent of adult-focused and adolescent-serving facilities that offer maintenance medication for opioid use disorder (MOUD) by facility characteristic,^a unadjusted odds of offering maintenance MOUD, and test for difference between adult-focused versus adolescent-serving facilities.

	Adult-focused facilities		Adolescent-serving facilities		Test for difference between adult and adolescent facilities ^c
	N (Row %)	Unadjusted OR ^b for maintenance MOUD (95% CI)	N (Row %)	Unadjusted OR ^b for maintenance MOUD (95% CI)	
All facilities	3612 (35.9%)		816 (23.1%)		
Facility ownership					
Private for-profit	1617 (42.7%)	<i>Ref</i>	226 (19.8%)	<i>Ref</i>	
Private non-profit	1557 (30.1%)	0.58 (0.53, 0.63)	503 (25.2%)	1.37 (1.14, 1.63)	< 0.001
State/local/tribal gov	252 (31.0%)	0.60 (0.51, 0.71)	85 (21.9%)	1.13 (0.85, 1.50)	< 0.001
Federal gov	186 (67.4%)	2.78 (2.14, 3.60)	2 (15.4%)	0.74 (0.16, 3.34)	0.09
Hospital-affiliated	577 (55.5%)	2.45 (2.15, 2.79)	115 (48.9%)	3.55 (2.72, 4.65)	0.02
Payment/insurances accepted					
Private insurance	2709 (39.9%)	1.73 (1.58, 1.90)	765 (27.9%)	5.92 (4.34, 8.07)	< 0.001
Medicaid	2377 (39.3%)	1.47 (1.35, 1.60)	684 (25.9%)	2.06 (1.67, 2.54)	0.003
Other public insurance	2339 (38.3%)	1.29 (1.19, 1.41)	681 (26.5%)	2.26 (1.85, 2.78)	< 0.001
Free & reduced fees	2200 (31.8%)	0.56 (0.52, 0.61)	616 (21.9%)	0.73 (0.61, 0.89)	0.01
Cash & self-pay only	248 (41.5%)	1.29 (1.09, 1.52)	7 (13.2%)	0.50 (0.23, 1.12)	0.02
Accepts government grants	1628 (31.7%)	0.68 (0.63, 0.74)	479 (22.7%)	0.97 (0.82, 1.14)	< 0.001
Certification, licensing, or accreditation					
By state/hospital authority	3227 (35.8%)	0.93 (0.81, 1.06)	762 (24.2%)	1.95 (1.44, 2.63)	< 0.001
By national authority	2684 (51.4%)	4.43 (4.05, 4.85)	478 (28.1%)	1.73 (1.47, 2.02)	< 0.001
US census regions					
1: Northeast	1034 (51.2%)	<i>Ref</i>	285 (48.8%)	<i>Ref</i>	
2: Midwest	708 (29.2%)	0.39 (0.35, 0.45)	208 (24.1%)	0.33 (0.27, 0.42)	0.21
3: South	1082 (36.2%)	0.54 (0.48, 0.61)	182 (18.4%)	0.24 (0.19, 0.30)	< 0.001
4: West	764 (30.4%)	0.42 (0.37, 0.47)	137 (12.6%)	0.15 (0.12, 0.19)	< 0.001
Other/territories	24 (26.4%)	0.34 (0.21, 0.55)	4 (30.8%)	0.47 (0.14, 1.53)	0.64

	Adult-focused facilities		Adolescent-serving facilities		Test for difference between adult and adolescent facilities ^c	
	N (Row %)	Unadjusted OR ^b for maintenance MOUD (95% CI)	N (Row %)	Unadjusted OR ^b for maintenance MOUD (95% CI)		p-value
All facilities	3612 (35.9%)		816 (23.1%)			
Levels of care provided						
Inpatient	286 (48.8%)	1.76 (1.49, 2.08)	65 (50.4%)	3.59 (2.52, 5.12)		<0.001
Residential	841 (31.0%)	0.74 (0.67, 0.81)	93 (22.5%)	0.97 (0.76, 1.23)		0.048
Outpatient	3044 (38.4%)	1.72 (1.55, 1.91)	759 (23.2%)	1.13 (0.83, 1.53)		0.01

^a Chi-square p-value statistically significant at <0.05 for all bolded OR's

^b Odds Ratio reference category for facility ownership type was private for-profit status (thus the odds ratios are the odds of each other ownership type offering an maintenance MOUD compared to the odds of a private for-profit offering maintenance MOUD). Similarly for US census regions, northeast location was the reference category. For all other odds ratios, the reference category is a facility without that particular characteristic (ie. Hospital-affiliated vs. not hospital-affiliated; accepting private insurance vs. not accepting private insurance).

^c P-Value is derived from an interaction coefficient in an unadjusted logistic regression model that included separate terms for adolescent-serving, the particular characteristic, and their interaction; this allowed for testing whether the association with the particular characteristic differed between adolescent-serving and adult-focused facilities. No additional analyses were performed for interactions found to be significant, as the goal was to describe associations as they exist in this near universal representation of treatment facilities.