Oregon Health & Science University
School of Medicine

Scholarly Projects Final Report

Title *(Must match poster title; include key words in the title to improve electronic search capabilities.)*

Examining Opioid Treatment Program Availability and Use in the United States

Student Investigator's Name

Andrew Molitor

Date of Submission *(mm/dd/yyyy)*

03/16/2023

Graduation Year

2023

Project Course *(Indicate whether the project was conducted in the Scholarly Projects Curriculum; Physician Scientist Experience; Combined Degree Program [MD/MPH, MD/PhD]; or other course.)*

Scholarly Projects Curriculum

Co-Investigators *(Names, departments; institution if not OHSU)*

None

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Concentration Lead's Name

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Project/Research Question

The project has two aims:
Aim 1: Examine the geographic association between availability of specialized SUD treatment centers across states and need in the state.
Aim 2: Examine the association between availability of SUD treatment, volume of SUD treatment, and

Type of Project *(Best description of your project; e.g., research study, quality improvement project, engineering project, etc.)*

Research Study

Key words *(4-10 words describing key aspects of your project)*

Opioid Use Disorder, Treatment Centers, Demographics

Meeting Presentations
If your project was presented at a meeting besides the OHSU Capstone, please provide the meeting(s) name, location, date, and presentation format below (poster vs. podium presentation or other).

None

Publications *(Abstract, article, other)*
If your project was published, please provide reference(s) below in JAMA style.

None

Submission to Archive
Final reports will be archived in a central library to benefit other students and colleagues. Describe any restrictions below (e.g., hold until publication of article on a specific date).

None

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Next Steps
What are possible next steps that would build upon the results of this project? Could any data or tools resulting from the project have the potential to be used to answer new research questions by future medical students?

Access to data on opioid use prevalence in different demographic groups would allow for a more robust analysis of potential associations with access to OUD treatment in the future. Additionally, demographic variables only available in the TEDS restricted data set such as age of first opioid use, employment status, and housing status are possibly impacted by access to opioid treatment and would be interesting to examine.

Please follow the link below and complete the archival process for your Project in addition to submitting your final report.

https://ohsu.ca1.qualtrics.com/jfe/form/SV_3ls2z8V0goKiHZP

Student's Signature/Date *(Electronic signatures on this form are acceptable.)*
This report describes work that I conducted in the Scholarly Projects Curriculum or alternative academic program at the OHSU School of Medicine. By typing my signature below, I attest to its authenticity and originality and agree to submit it to the Archive.

X_____   3/16/2023
Student's full name

Mentor's Approval *(Signature/date)*

X_____   3/16/2023
Mentor Name

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Report*: Information in the report should be consistent with the poster, but could include additional material. Insert text in the following sections targeting 1500-3000 words overall; include key figures and tables. Use Calibri 11-point font, single spaced and 1-inch margin; follow JAMA style conventions as detailed in the full instructions.*

Introduction *(≥250 words)*

Misuse of opioids has become a public health emergency in the last two decades. In 2019, an estimated 9.7 million people misused opioid pain relievers and 745,000 used heroin[1]. Of these, approximately 1.6 million individuals met the criteria for opioid use disorder[1]. In the same year, there were nearly 50,000 deaths related to opioid overdose, accounting for 70.6% of all drug overdose deaths[2]. In the wake of the COVID-19 pandemic the situation has only become more dire, with over 68,000 opioid overdose deaths in 2020 and over 80,000 in 2021[2].

The gold standard for treatment of OUD is induction and maintenance treatment with medications for opioid use disorder (MOUD). The three medications used most frequently are methadone, a long-acting synthetic opioid, buprenorphine, a very high affinity partial μ-opioid receptor agonist sometimes given in combination with naloxone (suboxone), and extended-release naltrexone, both an opioid receptor antagonist and weak partial agonist. How these treatments are distributed to patients is variable. Methadone, the most widely used medication, can only be dispensed by licensed opioid treatment programs. At this time, there are just over 1900 specialty opioid treatment programs in the entire country[3], all but ensuring difficult access to many patients. Buprenorphine can be dispensed in a primary care setting but historically required a special waiver for the prescribing physician. However as of 2023 this waiver requirement has officially been rescinded by the federal government, allowing any physician with intact DEA registration to prescribe buprenorphine. Naltrexone is given as a monthly intramuscular injection for OUD, though is also used in pill form for treatment of alcohol use disorder and can be prescribed by any licensed practitioner.

While many areas of the country have improved access to treatment since the onset of this epidemic, other areas are lacking in their treatment offerings. Many structural barriers to care exist, such as distance from a treatment center, lack of affordability, stigma, and difficulty securing childcare[4]. In addition, many of these barriers are considerably exaggerated in a rural versus an urban environment. For instance, patients in rural areas often have much longer driving distances to the nearest SUD treatment facility than those in urban environments[5]. As a consequence, only 19% of those with opioid use disorder receive OUD specific medication assisted treatment[6]. While there are many factors in addition to structural barriers to an individual receiving treatment for OUD, reducing barriers to access improves participation and improves treatment outcomes[7,8].

Previous work by Abraham et al examined the geographic disparities of specialty opioid treatment programs, showing that the southeast United States has the largest gap between opioid use disorder rates and capacity for treatment by county[9]. However, there is evidence that this disparity has diminished over time. A study by Yarbough et al found that from 2009 to 2017 counties with high-severity opioid use disorder rates had increasing probability of having access to treatment programs and that many of the structural barriers to opioid use treatment across the country had declined significantly[10].

While this research examined availability of treatment for opioid use disorder across the country, looking into how that availability has affected patients' access to treatment in such centers has not been explored. The proposed research will provide evidence on how availability of specialized SUD treatment centers is associated with treatment access and quality as well as demographic characteristics of the patient population. Investigating this relationship will help identify geographic areas and patient populations that are particularly underserved and that could particularly benefit from improved access to OUD treatment.

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Methods *(≥250 words)*

Datasources

We assembled state-level datasets combining information from the 2019 National Survey of Substance Abuse Treatment Services (N-SSATS), the 2019 Treatment Episode Data Set – Admissions (TEDS-A), and the Kaiser Family Foundation (KFF). From N-SSATS, we collected for each state the number of treatment centers, number of facilities with OTPs, number of clients in treatment (including clients being treated for drug abuse only and clients being treated for both drug and alcohol abuse, excluding clients being treated for alcohol abuse only), and number of clients receiving medication assisted treatment (MAT). While MAT can sometimes imply counseling and therapy services in combination with medication, in this study we used MAT to refer only to medication. Counseling and therapy services may be present at some of the included treatment centers but were not accounted for. N-SSATS does not provide data on the number of patients being treated for OUD specifically, and therefore this data captured some clients being treated for non-opioid drug use disorders. Clients included all patients currently admitted to hospitals or residential centers on March 29, 2019, and individuals seen at a facility at least once during March 2019 and who were still enrolled in treatment on March 29, 2019. From TEDS-A, we collected the following demographic information for admissions with a primary opioid diagnosis (in TEDS-A these are split into heroin and non-heroin opioid admissions, which we combined for this study): age at admission, gender, and race. TEDS-A only includes admissions to facilities that receive federal public funding, and therefore does not encompass all the treatment centers captured by the N-SSATS survey. Estimated population of individuals with past year opioid use disorder for 2019 was collected from KFF, which is based on restricted-used information from the National Survey on Drug Use and Health (NSDUH).

Outcomes

We linked data collected from N-SSATS to OUD prevalence estimates from KFF and characteristics of admitted OUD patients from TEDS-A for each state. We then explored various metrics to demonstrate how well each state is served by opioid use disorder treatment facilities relative to the population of patients with opioid use disorder. These metrics included percent of OUD population receiving treatment in SUD treatment facilities, percent of OUD population receiving MAT in SUD treatment facilities, and number of treatment centers per 1000 individuals with OUD. We calculated the percentage of OUD population receiving MAT in SUD treatment facilities by dividing the number of clients receiving MAT by the OUD population in a state. We calculated the number of treatment centers per 1000 individuals with OUD by dividing the total number of treatment centers by the OUD population over 1000. Outcome variables were percentage of patients on MAT, number of treatment centers per 1000 individuals with OUD, mean age of admitted patients, percent men/women of admitted patients, and percent admitted patients recorded as Black.

Analysis

The analysis was conducted at the state level. We used scatterplots and heat maps to visualize outcome variables. When indicated we used linear regression analyses with a confidence level of 95% to identify correlation between variables to assess bivariate associations. Microsoft Excel was used for all map creation and statistical analyses.

Results *(≥500 words)*

Overall, 15,852 treatment centers participated in the N-SSATS survey for an average of 310.8 treatment centers per state. California had the highest number of treatment centers (1,797) while Washington DC had the fewest (26). Of those facilities New York had the most incorporating OTPs (191) and Wyoming the fewest (0). Minnesota had the greatest number of treatment centers per 1000 citizens with past year OUD (100.75), though this value is potentially falsely elevated as the KFF reports population of individuals with OUD in Minnesota as 4000, which contradicts information available on the Minnesota Department of Health website listing the number of admissions for OUD treatment, not total OUD

population, as 10,231. The state with the second most treatment centers per 1000 citizens with OUD was Idaho (62), and the state with the fewest was Alabama (2.3) (Figure 1).
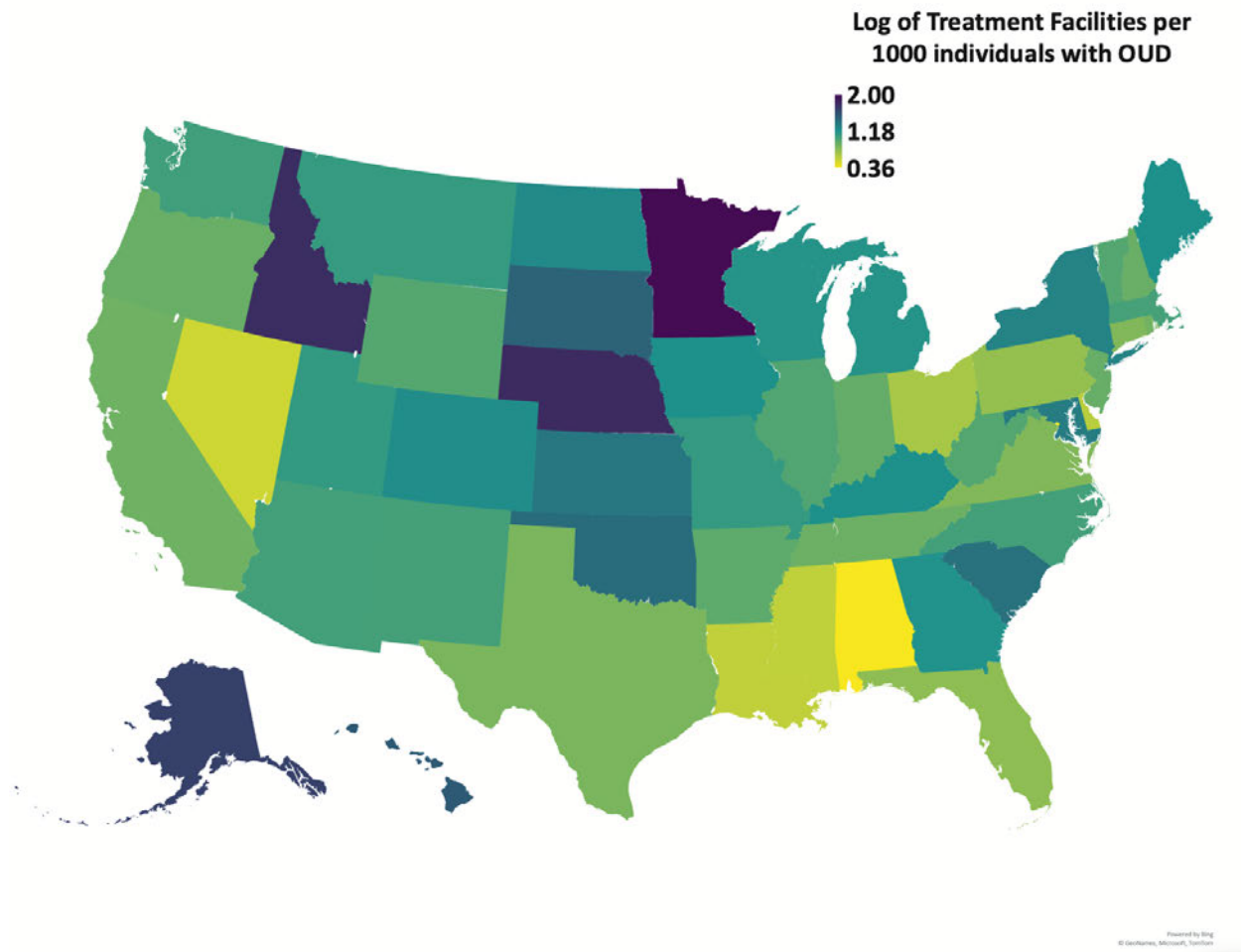

Figure 1.

In addition to Alabama, Nevada, Delaware, Washington DC, Louisiana, and Mississippi had the lowest availability of OUD treatment in the US as determined by number of treatment centers per 1000 individuals with OUD. Regionally, the south was the worst performing by this metric, and the Central US the best. In general, less populated states tended to have a greater number of treatment centers per 1000 individuals with OUD.

The percentage of SUD treatment facility clients who were receiving MAT exhibited contrasting geographic variation (Figure 2). This measure contrasted with the number of treatment centers per 1000 individuals with OUD in that as a region, the south performed the best while the Central US had the lowest percentage of clients receiving MAT. On a state-by-state basis Utah had the highest percentage of clients receiving MAT (92.85%), and South Dakota the lowest (9.02%).
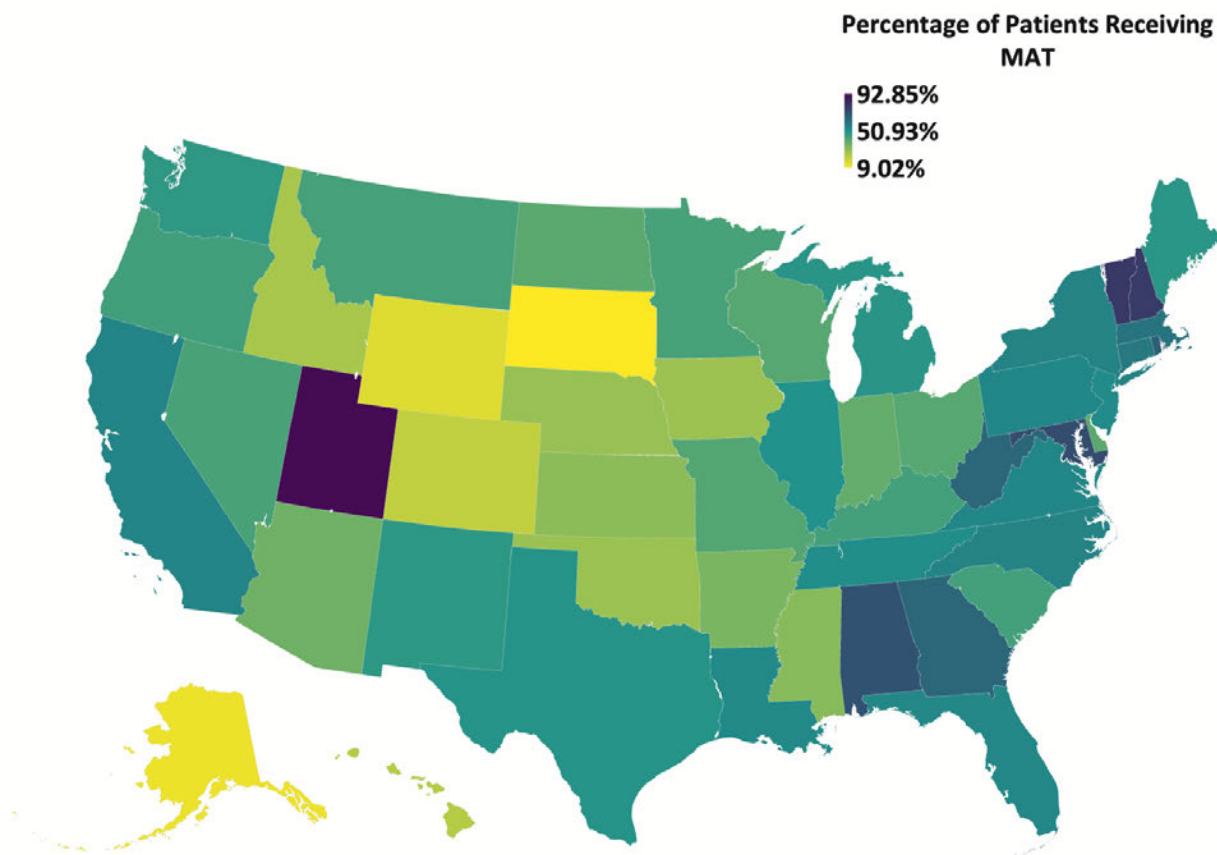
Figure 2.

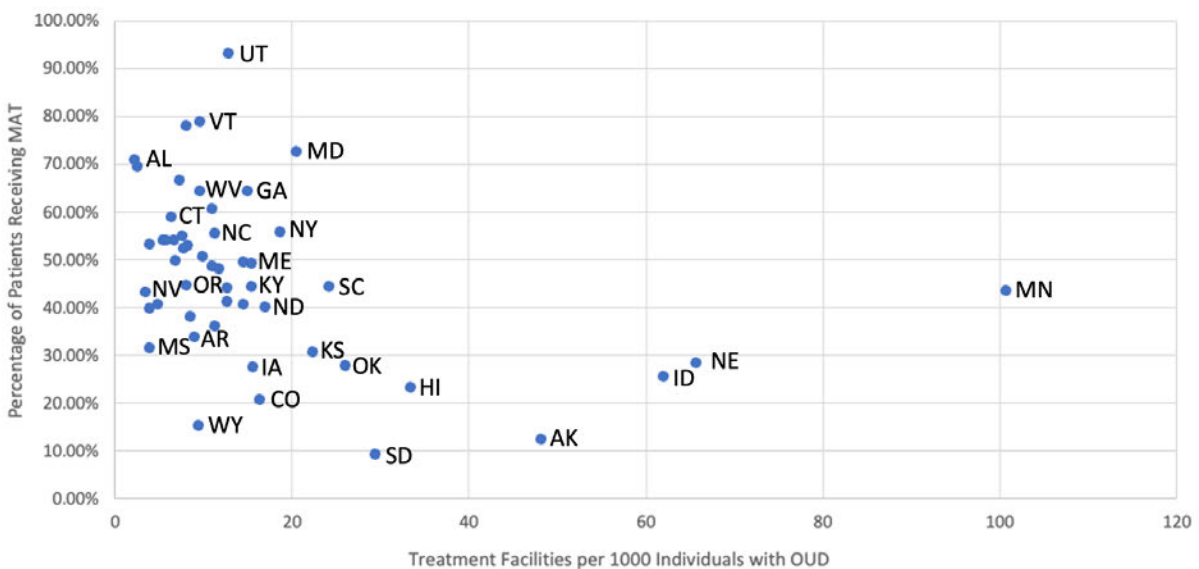**Figure 3.**

Many states who performed relatively better when examining the number of treatment centers per 1000 individuals with OUD did relatively worse when considering the percentage of patients on MAT (Figure 3). Alaska, Idaho, Nebraska, and Minnesota had a relatively low proportion of patients on MAT relative to their treatment facilities per 1000 individuals with OUD, but there is no obvious trend here.

We found a strong positive correlation between the number of facilities in a state and number of clients receiving MAT ($p < 0.01$) (Figure 4). States that performed better than expected included New York, Massachusetts, Connecticut, Arizona, and Pennsylvania while states that performed worse than expected included California, Colorado, and Illinois.
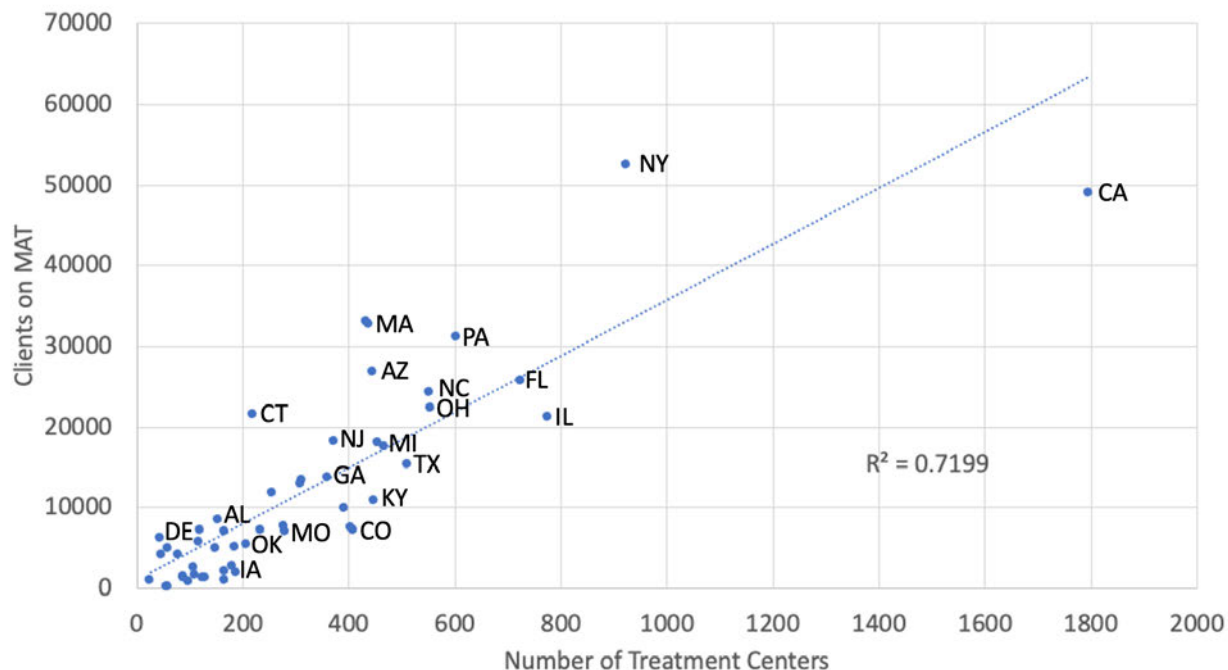

Figure 4.

A negative association was observed between the number of treatment centers per 1000 individuals with OUD in a state and the proportion of black patients in that state, but it was not statistically significant ($p = 0.16$) (Figure 5). Washington DC had the highest proportion of Black/African American clients (94%) while Wyoming had the lowest (0.46%). South Dakota had the highest proportion of American Indian/Alaskan Native clients (31%) while Washington DC had the lowest (0%). Washington DC also had the largest discrepancy in client gender, with over 4 times as many clients identifying as men than women. New Mexico had the greatest proportion of patients between the ages of 12-20 years old (14%). In most states the majority of clients fall between the ages of 25 and 39 years old.
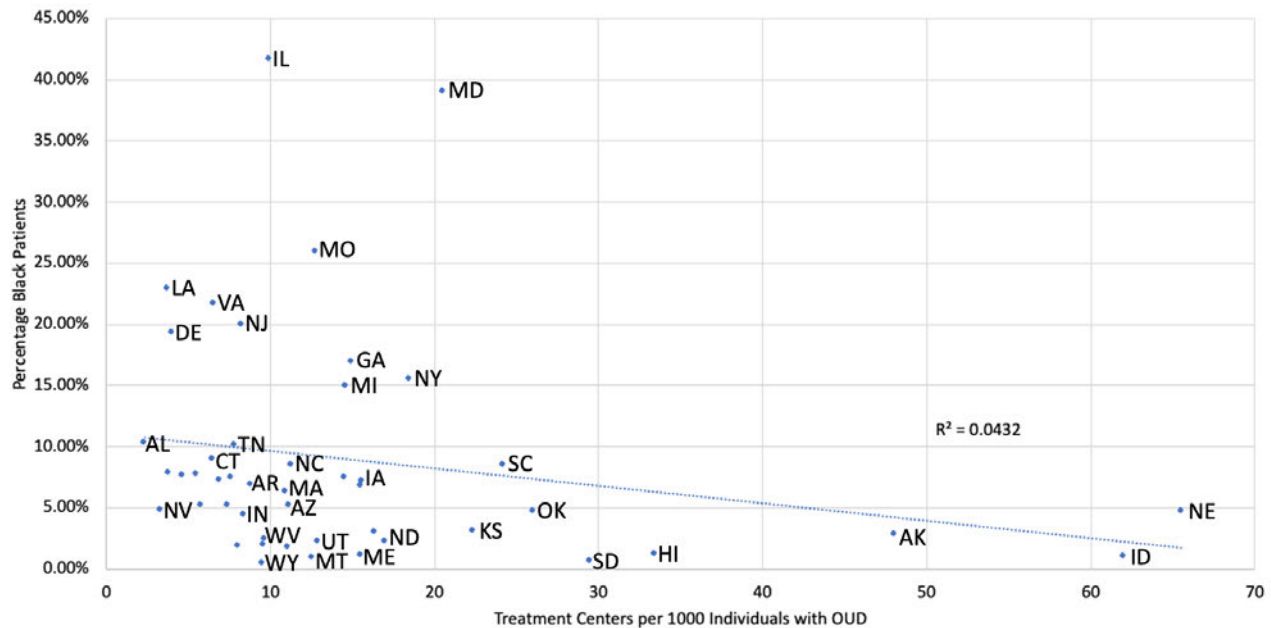
Figure 5 (Minnesota and DC excluded).

Discussion *(≥500 words)*

The number of treatment centers per 1000 individuals with OUD metric aligned well with previously described state trends of generally poor access to OUD treatment in the south and the best availability to treatment in New England, as determined through more complex analysis conducted by Abraham et al. This contrasts with the map of percentage of patients on MAT and demonstrates that lack of access to treatment does not necessarily equate to those able to access treatment receiving outdated or less effective therapy. Alabama is an excellent example of this, as one of the worst performers in treatment centers per 1000 individuals with OUD and one of the states with the highest percentage of patients on MAT.

This comparison possibly illustrates how effectively a state is implementing treatment centers and utilizing existing centers. Geographic placement of treatment centers is likely a large driver in the discrepancies observed here. For example, if a state has relatively few treatment centers but they are located in areas that are easily accessible to those seeking treatment, it is reasonable to assume that more people would initiate and continue MAT. Conversely if centers are located in places requiring people to commute long distances, it makes it more difficult to consistently visit, and more difficult to stay on methadone in particular.

The clear association between number of treatment centers and number of patients on MAT shows a path forward for many states to improve OUD treatment. MAT (buprenorphine and methadone in particular) is known to reduce overdoses and opioid-related morbidity[11]. Treatment centers are under-implemented in many states. This data does not account for buprenorphine administered in the primary care setting. Despite this, treatment centers often include many resources that are not available through primary care such as counseling and assistance in accessing various social services and remain one of the most effective ways states can increase access to treatment and improve utilization of MAT.

The negative association seen between number of treatment centers per 1000 individuals with OUD and proportion of Black patients, while not statistically significant, raises some interesting questions. As described above, states in the south tend to have a lower number of treatment centers relative to their OUD population, but a high percentage of MAT utilization. These states have a higher population of Black people, but despite this their proportion of Black patients is not much greater than, and sometimes less

than, states with fewer Black people. An example of this is Georgia having a lower proportion of Black patients than Virginia. While these findings are based on aggregated and imperfect data, they suggest that future research comparing access to treatment generally, and MAT specifically, across states for black individuals with OUD could be important.

While no other correlation was found in this study between explored potential metrics examining access to OUD treatment and the demographic factors of age, gender, and race, it does not mean that they do not exist. Identifying as part of a minority group is associated with a lower likelihood of being referred to treatment by a medical professional, and a decreased likelihood of having MAT integrated into the treatment plan[12]. It stands to reason that access to treatment also varies amongst racial groups as well as other demographic factors, and likely influences OUD in the respective communities affected by that access. Access to data on opioid use prevalence in different demographic groups would allow for a more robust analysis of potential associations with access to OUD treatment. Additionally, demographic variables only available in the TEDS restricted data set such as age of first opioid use, employment status, and housing status are possibly impacted by access to opioid treatment and would be interesting to examine.

Limitations. This study has a few notable drawbacks, the most notable being that number of treatment centers per 1000 individuals does not account for treatment center capacity. In practice, capacity is difficult to measure given the content of the surveys administered my SAMSHA and would require some data not readily available. In addition, in this study we only looked at the state level. This does not account for distance to the nearest treatment center, another major barrier to individuals seeking treatment. This is of greater consequence in geographically larger states, especially when considering urban versus rural OUD treatment. Finally, while N-SSATS includes all known treatment centers in the United States that respond to the survey, TEDS-A only captures those that receive federal public funding, making comparisons between the two datasets difficult and less accurate. In addition, we did not include demographic information for people with OUD, but only patients admitted to facilities receiving federal public funding. Comparing OUD demographic data to that presented by TEDS-A could be a point of further study.

Conclusions *(2-3 summary sentences)*

Number of treatment centers per 1000 individuals with OUD is a reasonable large-scale metric to evaluate access to opioid treatment in each state and showed southern states having the fewest treatment centers per 1000 individuals with OUD, and the central/midwestern states the most. There is a clear association between the number of treatment facilities a state has and the number of patients on MAT in that state. A tentative negative association between treatment centers per 1000 individuals with OUD and percentage of black patients was observed, but no other correlations with examined demographic data was identified. Treatment facilities are under-implemented in many states and provide an avenue for improvement of OUD treatment across the country.

References *(JAMA style format)*

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