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Population-based estimates of geographic accessibility of medication for opioid use disorder by substance use disorder treatment facilities from 2014 to 2020

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Abstract

Background: Understanding whether individuals have geographic accessibility to a substance use disorder treatment facility and a treatment facility that offers medication treatment for opioid use disorder (MOUD) can inform efforts to address the ongoing opioid crisis.

Methods: We used data from the National Directory of Drug and Alcohol Abuse Treatment Programs. First, we calculate the national share of treatment facilities that offer one type of MOUD or all forms of MOUD using a novel dataset of providers. Second, we quantify the share of counties with a treatment facility offering at least one type of MOUD. Finally, we calculate the share of the national population residing within a 10-mile radius of a treatment facility.

Results: The share of counties with a treatment facility offering a MOUD as a form of treatment rose from 30% to 45% from 2014 to 2020 while the share of counties with facilities offering all three forms of MOUD increased from 4% to 9%. Over 83% of the population lives within 10 miles of a facility offering MOUD treatment, and 42% of the population have a treatment facility that offers all three forms of MOUD within a 10-mile radius. Much of the difference between the county- and population-based measures is explained by more population dense areas having higher rates of facilities providing MOUD.

Conclusions: While the share of facilities within a county offering a MOUD is relatively small, the share of the population within 10 miles of such a facility is higher.

Keywords

Medications for opioid use disorder; Access to care

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1.0 Introduction

The number of drug overdose deaths involving opioids rose steadily between 1999 and 2017 (Hedegaard et al., 2020), and the number of drug overdose deaths rose dramatically during 2020 (Ahmad et al., 2021). According to the National Survey of Drug Use and Health (NSDUH) approximately 1.6 million individuals had an opioid use disorder (OUD) in 2019; the share of the population with an OUD has declined slightly between 2015 and 2019 (Substance Abuse and Mental Health Services Administration, 2020). Of those with an OUD, approximately 20 percent received treatment at a specialty substance use disorder facility in the past year (Substance Abuse and Mental Health Services Administration, 2019). Increasing the share of individuals with active OUD who receive treatment is critical to address this public health emergency.

Lack of geographic access to a treatment facility is considered a key barrier to the receipt of treatment (Substance Abuse and Mental Health Services Administration, 2020). The presence of treatment facilities has been associated with decreased county-level fatal overdose rates (Swensen, 2015). Use of medication treatment for opioid use disorder (MOUD: methadone, buprenorphine and naltrexone) is associated with decreases in general health care utilization, including inpatient hospital admissions and outpatient emergency department (ED) visits as well as reductions in overdose mortality (Larochelle et al., 2018; Mohlman et al., 2016; Samples et al., 2020; Wakeman et al., 2020). As a result, the use of MOUD has become the standard in long-term OUD recovery (Volkow et al., 2014). However, recent studies suggest that only 41 percent of licensed substance use disorder treatment facilities offer at least one form of MOUD and only three percent of facilities offer all three forms of treatment (Jones et al., 2018). There are also reportedly substantial disparities in geographic access to MOUD even at the census tract level (Guerrero et al., 2013).

Existing studies have examined the amount of methadone dispensed and buprenorphine prescribed at the state level (Jones et al., 2015), the amount of buprenorphine prescribed nationally (Olfson et al., 2020) and dispensed at the county level (Stein et al., 2015), the number of buprenorphine-waivered providers at the county-level (Ghertner, 2019; McBain et al., 2020), the number of providers with a buprenorphine-waivered prescriber surrounding the centroid zip code of a county within a 25-mile radius (Flavin et al., 2020), and the national supply of treatment facilities offering MOUD (Abraham et al., 2018; Mohlman et al., 2016; Mojtabai et al., 2019).

Previous research on the geographic accessibility of substance use disorder treatment facilities has mainly, but not entirely, been limited to county-level measures (Ducharme and Abraham, 2008; Joudrey et al., 2019). Few studies have been done at the census tract-level (Kao et al., 2014), zip code-level (Iloglu et al., 2021), census block group-level (Amiri et al., 2021), or had access to the patient's home address (Guerrero et al., 2013). The county-level studies have found that counties with a low number of OUD treatment facilities and buprenorphine waived physicians and with a high rate of opioid overdose mortality are more likely to have a higher rate of unemployment, have a lower primary care

clinician density, and are less likely to be micropolitan (Haffajee et al., 2019). However, recent work by Yarbrough and colleagues (2020) found that the probability of having at least one treatment facility offering buprenorphine, methadone, or both was higher in counties with a high-severity problem with opioids compared to a low-severity problem with opioids, where severity was defined using a factor analysis of drug-related mortality rate, opioid prescription rate and drug-related arrest rate. They also find that distance to the nearest program has fallen over time but that change did not vary based on severity status (Yarbrough et al., 2020). A previous study at the county-level has also established that access to opioid treatment programs is worse compared to access to other chronic diseases for five states (Joudrey et al., 2019). Work at the census block group-level found that access to opioid treatment programs is worse in micropolitan and small towns (Amiri et al., 2021). Lack of geographic access to treatment continues to be listed as an important barrier for individuals with substance use disorder (Substance Abuse and Mental Health Services Administration, 2020).

One common limitation of studies about treatment accessibility is that broader metrics at the state or county-level may obscure local variation in geographic accessibility. This is particularly problematic given current efforts to allocate resources to address the opioid epidemic are often based on state- and county-level measures (U.S. Department of Health and Human Service Office of Inspector General, 2020). To address this gap in the literature, this study uses addresses of licensed substance use disorder treatment facilities from 2014 to 2020 to identify the total share of the U.S. population within a 10-mile radius of a licensed treatment facility offering MOUD. The calculation of the share of the population within the 10-mile radius more accurately describes whether an individual has geographic access to treatment, and in particular geographic access to MOUD. We chose the 10-mile radius given that it has been previously used to measure geographic access to MOUD by buprenorphine providers and not licensed substance use disorder treatment facilities (Langabeer et al., 2020). In addition, a study on driving times to an opioid treatment program found that over half (60%) of patients travelled less than 10 miles to receive treatment and 94% traveled 50 miles to receive treatment (Rosenblum et al., 2011). We compare the population- and county-level measures to improve understanding of geographic accessibility to treatment facilities, using data as recent as 2020. The county-level measures are important because they are frequently used in the literature to measure geographic access and offer an important contrast to understanding gaps in geographic access as currently commonly measured. We also calculate the share of the population in counties that lack a treatment facility but are within a 10-, 25- and 50-mile radius of one from the centroid of their census tract. Moreover, we are unaware of other studies quantifying the share of the population close to treatment facilities offering multiple types of MOUD. This is a critical gap in the literature given that the number of drug overdoses likely increased in 2020 (ODMAP, 2020), and barriers to treatment, including geographic access, may have increased amidst the COVID-19 pandemic (Alexander et al., 2020; Volkow, 2020).

2.0 Data

We collected data on nearly all licensed substance use disorder treatment facilities between the years 2014 and 2020 from a national survey administered by the Substance Abuse

and Mental Health Services Administration (SAMHSA). We used the National Directory of Drug and Alcohol Abuse Treatment Facilities of federal, state, and local government facilities and private facilities that provide substance use disorder treatment services. The annual directory includes all treatment facilities that (1) are licensed, certified or otherwise approved for inclusion by the state substance abuse agency, and (2) responded to the previous year's National Survey of Substance Abuse Treatment Services (N-SSATS). The available N-SSATS data do not report geographic identifiers below the state-level, but the National Directory of Drug and Alcohol Abuse Treatment Facilities includes addresses for most facilities. We scraped information on the name address, and forms of treatment available for each treatment facility listed in each year of the annual directory. Next, we successfully geocoded 97.8% of the listings at the address level, and an additional 1.5% of the listings at the Zip code-level using ArcGIS version 10.6.

Each licensed substance use disorder treatment facility reports the types of care offered, including the types of medication to treat OUD provided. Facilities are categorized as offering methadone if they are federally certified as an Opioid Treatment Program and report offering methadone maintenance treatment. Facilities offering methadone detoxification were not included. The detoxification measure does not differentiate between methadone or buprenorphine separately. Facilities that reported offering buprenorphine, buprenorphine with naloxone, buprenorphine without naloxone, or buprenorphine sub-dermal implants were categorized as offering buprenorphine. Facilities that reported offering extended-release naltrexone (first listed on surveys in 2014) were categorized as offering naltrexone. Because naltrexone was not listed in the directories until 2014, we begin our analysis in 2014.

Treatment facilities offering methadone, buprenorphine and extended-release naltrexone were classified as offering all forms of MOUD.

3.0 Methods

Using addresses of licensed substance use disorder treatment facilities offering MOUD, we geocoded the facilities and calculated population-based measures of geographic accessibility of treatment facilities. First, we describe the national share of treatment facilities offering at least one form of MOUD, at least two forms of MOUD, and all three forms of MOUD. Second, we quantify the share of counties in 2014 and 2020 that did not have a treatment facility, the share with a treatment facility offering any form of MOUD, and the share with a treatment facility offering all three forms of MOUD. Third, we report the percent of the US population in 2014 and 2020 residing within a 10-mile Euclidean distance from a treatment facility; a treatment facility offering any form of MOUD; and a treatment facility offering all three forms of MOUD. Finally, to more clearly contrast the county-level measures and the Euclidean distance measures we report the percentage of people who live in a county without a treatment facility but who live within 10-, 25- and 50-miles from a facility. We also calculate these number for people who live within those distances from a facility that offers all forms of MOUD.

The county-level measures are not weighted by population size, and solely reflect the share of counties with a facility meeting the criteria listed above. By their nature, we expect that the population-level metrics disproportionately reflect proximity to treatment facilities in areas with more population. Half of the United States population lives in the 146 largest counties, so population-weighted measures are potentially very different from county-level metrics. We use the unweighted county measures to illustrate these differences.

Using GEODIST in SAS version 9.4, we measure the distance between the longitude-latitude coordinates of the centroid of each Census Block Group in the U.S. and the longitude-latitude coordinates of each facility. Batch geocode results were investigated for accuracy using random spot checking to verify matches and check those addresses that did not match. This was in part to investigate whether non-matches were the product of a systematic data issue. A minimum street address-level match of 80 (out of 100) was required to consider an address a match. ArcGIS automatically resolves ties above 80. Addresses that did not match were excluded.

We also calculated all the population-based measures using a 25-mile and 50-mile radius from the treatment facility. Some of those complementary results are included in the Appendix. The study was deemed exempt by RAND's Institutional Review Board. Data were collected between 2017 and 2020. All analyses were done in 2020 and 2021.

4.0 Results

4.1 Trends in Offering of and Geographic Access to MOUD

Figure 1a reports the share of facilities that offer a MOUD between 2014 and 2020, and Figure 1b reports the share of counties that have a treatment facility that offers a MOUD during the same time period. We also report the share of facilities or counties with a treatment facility that offers two forms of MOUD, and the share with all three forms of MOUD. The purpose of reporting these numbers is to offer a clear contrast to the population-based geographic access measures. In 2014, 30% of facilities offered at least one form of MOUD and 1% offered all three forms of MOUD. By 2020, the share of facilities offering at least one form of MOUD rose to 49%; the share offering all three forms rose to 4%. Figure 1a presents the national trends in the percentage of facilities offering MOUD for 2014–2020. This growth has been driven primarily by the prevalence of facilities providing buprenorphine and/or injectable naltrexone. In 2014, 22.3% of facilities offered buprenorphine and 12.3% offered injectable naltrexone. By 2020 the share of facilities offering buprenorphine rose to 40.7% and injectable naltrexone to 34.8% (data not shown). Across 2014 and 2020, 3% of facilities offered naltrexone only, and not buprenorphine or methadone. In comparison, the share of facilities offering methadone rose from 9.4% to 10.8% between 2014 and 2020. Finally, the share of counties that had a treatment facility offering all three forms of MOUD increased from 3.5% in 2014 to 8.9% in 2020 (Figure 1b).

In Figure 2, we report the county-level measures for geographic access to treatment facilities, treatment facilities that offer one form of MOUD, and treatment facilities that offer all three forms of MOUD. In 2014, 63.8% of counties in the US had at least one treatment facility (47.8% with 1–4 facilities; 16.0% with 5+), 29.5% of counties had a

treatment facility that offered at least one form of MOUD (23.5% with 1–4; 6.0% with 5+), and 3.5% of counties had a treatment facility that offered all forms of MOUD (3.4% with 1–4; 0.1% with 5+). By 2020, the percentage of counties with a treatment facility increased to 68.2% (47.8% with 1–4 facilities; 20.4% with 5+), the percentage of counties with a treatment facility that offered at least one form of MOUD rose to 44.5% (33.7% with 1–4; 10.8% with 5+), and the percentage of counties with a treatment facility that offered all forms of MOUD increased to 8.9% (8.5% with 1–4; 0.4% with 5+).

Figure 3 presents similar metrics as Figure 2 but expressed in terms of the share of the population within 10 miles of treatment access. In 2014, 87.6% the population had at least one substance use disorder treatment facility within a 10-mile radius and 83.2% lived within 10 miles of a facility offering at least one form of MOUD. In fact, we observe 62.8% of the population within 10 miles of 5+ facilities offering at least one form of MOUD. Given the already high rates of access, there is little change by 2020 as 89.6% of the population lives within 10 miles of any substance use disorder treatment facility and 82.4% live within 10 miles of a treatment facility offering at least one type of MOUD.

We estimate more substantial growth in the share of the population living within 10 miles of at least one facility offering all three types of MOUD. In 2014, 28.4% (24.4% with 1–4; 0.5% with 5+) of the population lived within a 10-mile radius of at least one treatment facility that offers all three forms of MOUD. This rate increased to 41.7% (34.9% with 1–4; 6.8% with 5+) of the population in 2020.

4.2 Differences Between County and Population Measures of Geographic Access to MOUD

The discrepancies between county rates and population rates are the result of higher population density areas having higher rates of facilities providing MOUD. For example, 17.5% of counties with a population above the median in 2020 had a treatment facility offering all forms of MOUD; less than 1.0% of counties with below-median population had a treatment facility providing all MOUD services. Figure 4 reports the share of people living in a county without a treatment facility but within 10-, 25-, and 50-miles of a facility. In 2020, 13.5% of the population living in a county without a treatment facility (2.2 million people) resided within 10 miles of a treatment facility. 1.4% of that population living within 10 miles of a facility offering all forms of MOUD. Both sets of numbers for 2020 rise substantially once being measured with a 50-mile distances (76.6% for any treatment facility and 31.8% for all forms of MOUD).

5.0 Discussion

In this cross-sectional study of nearly all licensed substance use disorder treatment facilities listed in the directories, we find that the share of facilities that offer MOUD has experienced strong growth between 2014 and 2020, as did the share of counties with a treatment facility. Our results are consistent with the existing literature (Mojtabai et al., 2019), but include the most recent data available. We also found that there is a significant disconnect in existing county-level measures of geographic accessibility to MOUD from a treatment facility and population-based measures of geographic accessibility. We found **that in 2020 42% of the**

U.S. population lives within 10 miles of a facility offering all three forms of MOUD. In addition, 31.8% of those that reside in a county without a treatment facility are within 50 miles of a facility that offers all forms of MOUD in 2020. Of course, while highly populated areas may be more likely to have a treatment facility or facilities, they could still potentially have inadequate access to care. Our results are in line with separate studies that used data on buprenorphine waived prescribers only (Langabeer et al., 2020) and opioid treatment programs only (Kleinman, 2020).

The use of a MOUD is a critical component in the treatment for individuals with OUD. **One reason for the dearth of facilities offering all three forms of MOUD is the strict regulations for methadone. Methadone can only be dispensed at OTPs certified by SAMHSA. In addition, federal rules impose treatment requirements, and states have their own supplementary regulations. It has been suggested that relaxing some of these regulations may increase the number of providers offering methadone** (McBournie et al., 2019). Existing studies have expressed concern that access to buprenorphine services is distributed unequally throughout the country. Specifically, a report by the Department of Health and Human Services' Office of Inspector General recently recommended that SAMHSA should target efforts in expanding MOUD by increasing the number of waived providers in counties with the greatest need for buprenorphine services (U.S. Department of Health and Human Service Office of Inspector General, 2020). Our results would indicate that a more geographically precise and tailored approach is needed. Given that county is a coarse measure of geographic access, SAMHSA may be better served to identify areas of the country that have zero providers within a 10-mile radius.

This study includes several limitations. First, our data reflect only licensed substance use disorder treatment facilities, and do not include the approximately 10 percent of treatment facilities which are unlicensed (National Survey of Substance Abuse Treatment Services, 2016, 2016). or buprenorphine waived clinicians, both of which may provide MOUD. We do not include buprenorphine waived clinicians in our analysis because we lack detailed historical location data on where these clinicians practice. In fact, over 90 percent of the population lives within a 10-mile driving distance from a buprenorphine waived clinician (Langabeer et al., 2020), although many such clinicians are not actively treating any patients, and many of the others treat relatively few patients (Duncan et al., 2020; Stein et al., 2016; Thomas et al., 2017). Still, our results should be interpreted as a likely underestimate of access to these medications. Second, we have no information about the quality of care or capacity of facilities relative to demand in accessible locations that provide MOUD, and it is possible that facilities that provide MOUD may have long waiting lists. Third, our results are likely an underestimate of facilities offering MOUD, given that treatment facilities are not required to take the survey each year, and many do not. Fourth, our measure of geographic access is coarse, as many individuals without a vehicle still may not be able to access a facility within a 10-mile radius. See Figures A2 through A5 for equivalent 25-mile and 50-mile radius results, though similar concerns apply. Moreover, we do not have households' addresses to determine whether they are within 10 miles of a facility. Instead, we assign each person to the centroid of their Census block and then determine distance to the nearest facility. This approach follows closely to the approach used by Langabeer and

colleagues (2020) in calculating access to buprenorphine waived prescribers (Langabeer et al., 2020). Similarly, we do not differentiate travel time between car- and public-transit to the nearest facility. This is a concern given that in census tracts where access to a car is low that it may be difficult to travel to the nearest prescriber (Drake et al., 2020). Fifth, we do not examine each type of MOUD individually and each of the three medications have different clinical and regulatory differences. In addition, access for the three medications may differ over time by reflecting changes in the private sector's willingness to pay rather than broad access improvements. Sixth, our measures are based on the general population. The geographic distribution of individuals with OUD will likely differ from the general population (Morgan et al., 2018). Finally, our data do not capture all locations that provide extended-release naltrexone, because it can be administered by any clinician licensed to prescribe medications.

During the COVID-19 pandemic the opioid crisis continues to ravage communities throughout the United States. Our study suggests that prior to the pandemic there has been strong progress in the geographic accessibility of effective treatment for OUD prior to the pandemic. However, because treatment rates for OUD have remained relatively low there are potentially other reasons individuals are not receiving treatment. For example, many residential treatment programs do not offer MOUD (Beetham et al., 2020). Separately, recent work has identified that many buprenorphine prescribers do not offer a new appointment to potential patients who are active heroin users with Medicaid coverage (Beetham et al., 2019), and in many cases do not prescribe buprenorphine at their maximum patient capacity (U.S. Department of Health and Human Service Office of Inspector General, 2020). Similarly, buprenorphine-waivered prescribers and opioid treatment programs frequently did not accept insurance.(Patrick et al., 2020) During the pandemic there has been several policy changes including that opioid treatment programs can now issue a supply of up to 14 and 28 days of methadone to take home for less stable and stable patients, respectively. In addition, federal agencies have issued new guidance allowing greater use of telehealth for medication management visits for opioid use disorder. For example, waived prescribers can now induce patients onto buprenorphine remotely via telemedicine (Substance Abuse and Mental Health Services Administration, 2020). Separately, there is some consideration to remove the requirement to obtain a waiver in order to prescribe buprenorphine (Olsen et al., 2021; Weimer et al., 2021). These policy changes in conjunction with the growth in geographic access to MOUD may help to overcome barriers in receiving MOUD.

6.0 Conclusions

The results of this study are an important step for understanding how geographic access to treatment and MOUD has changed in recent years and suggests that geographic access may be less of a barrier than considered previously. **Approximately 42 percent of the U.S. population has a treatment facility within 10 miles that offers all three forms of MOUD in 2020.** Despite this, estimates of unmet need for treatment remain high. There are multiple barriers to receiving MOUD at a specialty provider. For example, an important barrier that our study does not capture is the cost of care. One in three individuals who needed but did not receive treatment had no health care coverage and were not able to afford

the cost of treatment(Substance Abuse and Mental Health Services Administration, 2019). Policymakers and public health officials should take a more comprehensive approach when addressing barriers to treatment that both increases the offering of MOUD by treatment facilities and removes cost barriers to receiving treatment.

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Appendix

Appendix



Figure A1:

Percent of population by Census Block Group with a Treatment Facility within 10-miles

Notes: This map studies access to facilities offering all three types of MOUD. The shaded areas in the map above represent counties and areas that do not have facilities in or near them that offer all three forms of MOUD. The gray areas are areas where there are no facilities present within a given county and there are no facilities present within a 10-mile radius of a Census Block Group. The areas in blue have a facility offering all three forms of MOUD within a 10-mile radius but not within its county. The areas in green have facilities offering all forms of MOUD within the same county as well as facilities within a 10-mile radius.

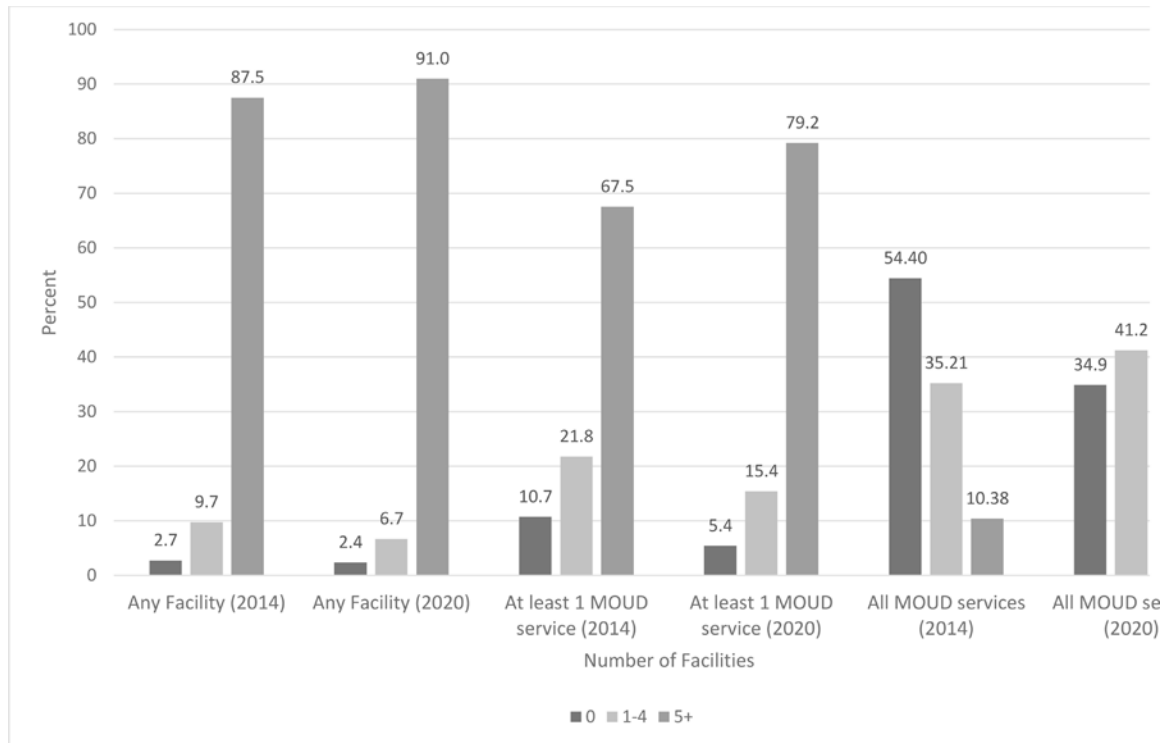


Figure A2:

Percent of population by Census Block Group with a Treatment Facility within 25-miles

Notes: Each bar represents the percentage of the population within 25 miles of 0, 1–4, or 5+ treatment facilities meeting criteria listed at base.



Figure A3:

Map of Differences in County and Population Geographic Access to Treatment Centers Offering All Three Forms of MOUD in 2020

Note: This map studies access to facilities offering all three types of MOUD. The shaded areas in the map above represent counties and areas that do not have facilities in or near them that offer all three forms of MOUD. The gray areas are areas where there are no facilities present within a given county and there are no facilities present within a 25-mile radius of a Census Block Group. The areas in blue have a facility offering all three forms of MOUD within a 25-mile radius but not within its county. The areas in green have facilities offering all forms of MOUD within the same county as well as facilities within a 25-mile radius.

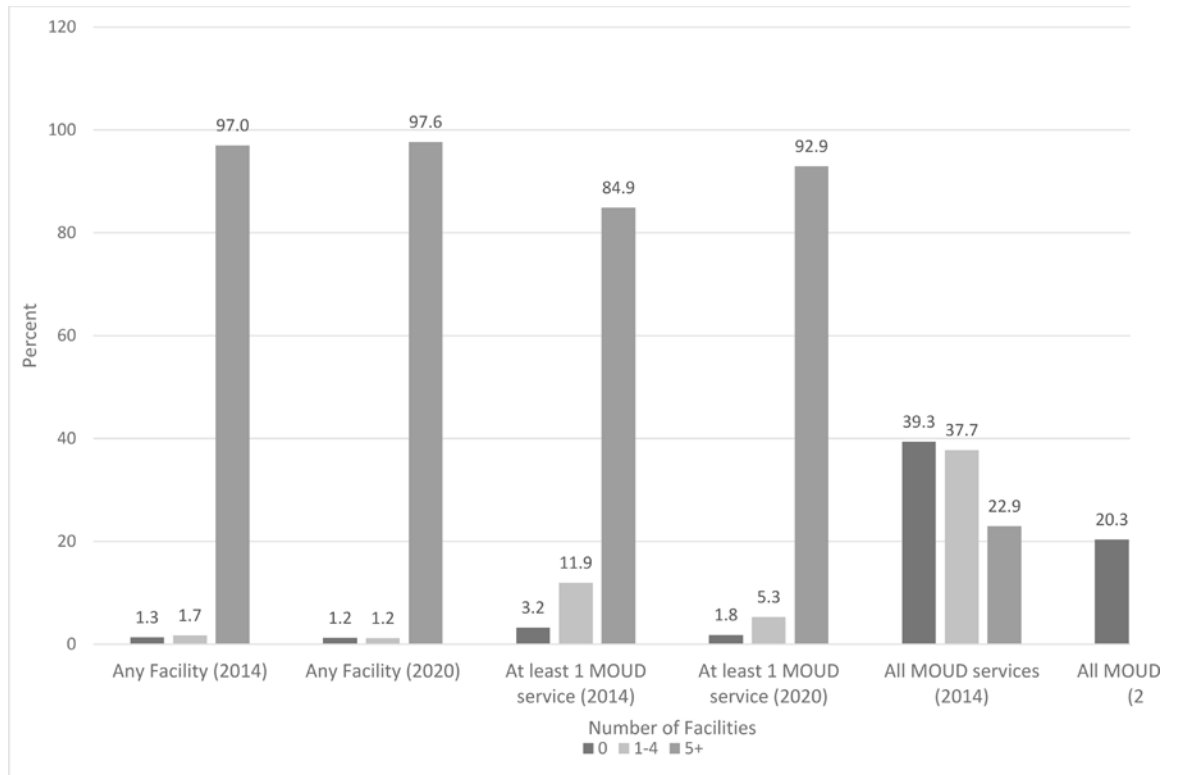


Figure A4:
 Percent of population by Census Block Group with a Treatment Facility within 50-miles
 Notes: Each bar represents the percentage of the population within 50 miles of 0, 1–4, or 5+ treatment facilities meeting criteria listed at base.

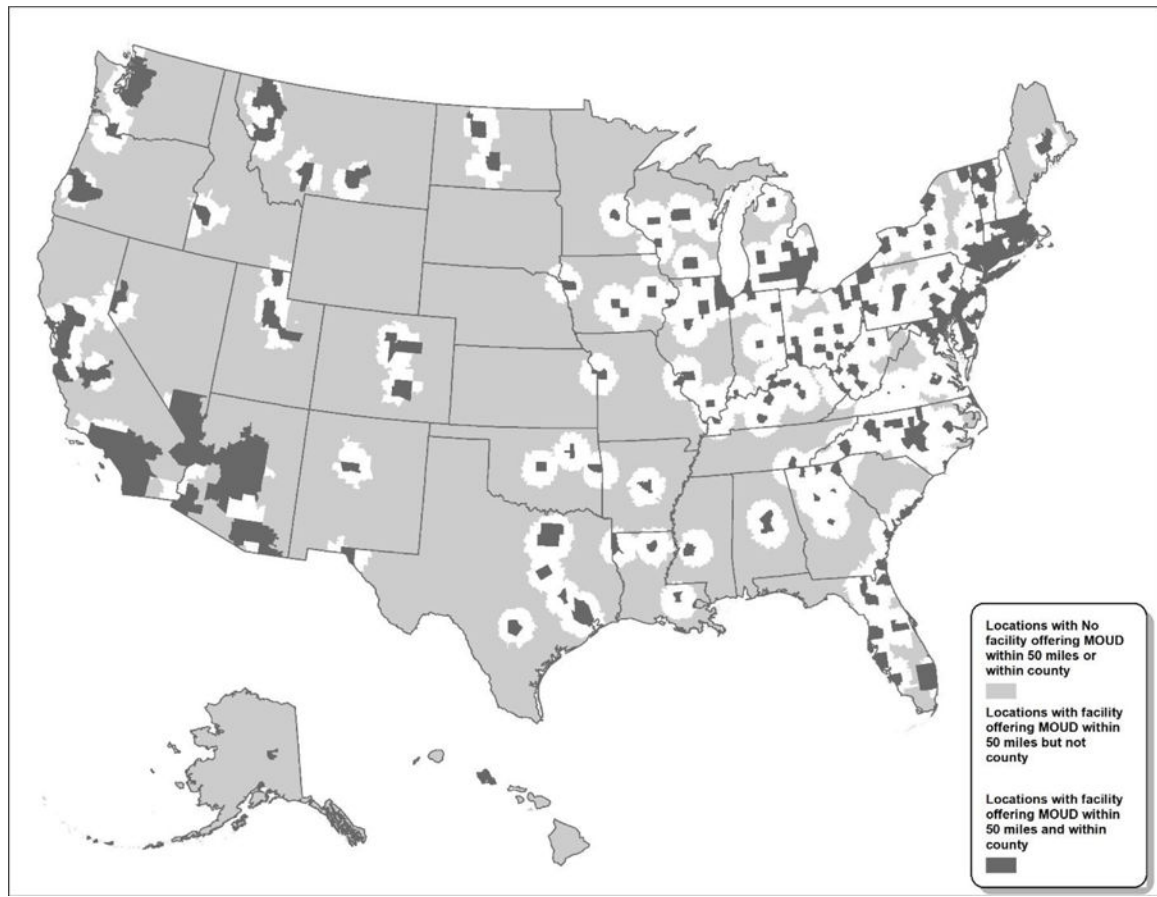


Figure A5:

Map of Differences in County and Population Geographic Access to Treatment Centers Offering All Three Forms of MOUD in 2020

Note: This map studies access to facilities offering all three types of MOUD. The shaded areas in the map above represent counties and areas that do not have facilities in or near them that offer all three forms of MOUD. The gray areas are areas where there are no facilities present within a given county and there are no facilities present within a 50-mile radius of a Census Block Group. The areas in blue have a facility offering all three forms of MOUD within a 50-mile radius but not within its county. The areas in green have facilities offering all forms of MOUD within the same county as well as facilities within a 50-mile radius.

References

- Abraham AJ, Andrews CM, Yingling ME, Shannon J, 2018. Geographic Disparities in Availability of Opioid Use Disorder Treatment for Medicaid Enrollees. *Health Services Research* 53, 389–404. 10.1111/1475-6773.12686 [PubMed: 28345210]
- Ahmad FB, Rossen LM, Sutton P. Provisional drug overdose death counts. National Center for Health Statistics. 2021. [WWW Document], n.d. URL <https://www.cdc.gov/nchs/nvss/vsr/drug-overdose-data.htm> (accessed 3.3.21).
- Alexander GC, Stoller KB, Haffajee RL, Saloner B, 2020. An Epidemic in the Midst of a Pandemic: Opioid Use Disorder and COVID-19. *Ann Intern Med*. 10.7326/M20-1141

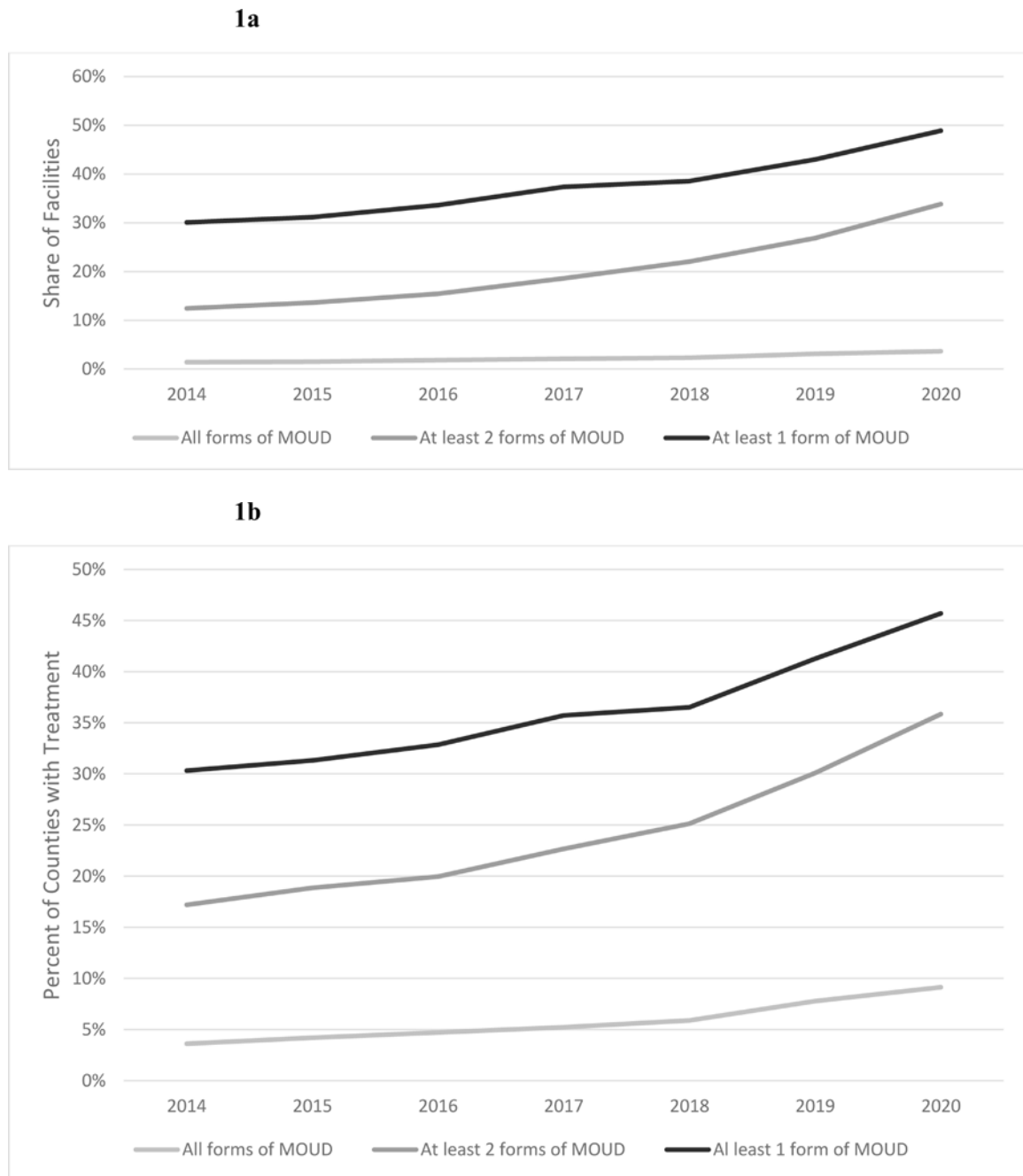
- Amiri S, McDonnell MG, Denney JT, Buchwald D, Amram O, 2021. Disparities in Access to Opioid Treatment Programs and Office-Based Buprenorphine Treatment Across the Rural-Urban and Area Deprivation Continua: A US Nationwide Small Area Analysis. *Value Health* 24, 188–195. 10.1016/j.jval.2020.08.2098 [PubMed: 33518025]
- Beetham T, Saloner B, Gaye M, Wakeman SE, Frank RG, Barnett ML, 2020. Therapies Offered at Residential Addiction Treatment Programs in the United States. *JAMA* 324, 804. 10.1001/jama.2020.8969 [PubMed: 32840587]
- Beetham T, Saloner B, Wakeman SE, Gaye M, Barnett ML, 2019. Access to Office-Based Buprenorphine Treatment in Areas With High Rates of Opioid-Related Mortality: An Audit Study. *Ann. Intern. Med.* 171, 1–9. 10.7326/M18-3457 [PubMed: 31158849]
- Drake C, Donohue JM, Nagy D, Mair C, Kraemer KL, Wallace DJ, 2020. Geographic access to buprenorphine prescribers for patients who use public transit. *Journal of Substance Abuse Treatment* 117, 108093. 10.1016/j.jsat.2020.108093
- Ducharme LJ, Abraham AJ, 2008. State policy influence on the early diffusion of buprenorphine in community treatment programs. *Substance Abuse Treatment, Prevention, and Policy* 3, 17. 10.1186/1747-597X-3-17
- Duncan A, Anderman J, Deseran T, Reynolds I, Stein BD, 2020. Monthly Patient Volumes of Buprenorphine-Waivered Clinicians in the US. *JAMA Netw Open* 3, e2014045–e2014045. 10.1001/jamanetworkopen.2020.14045
- Flavin L, Malowney M, Patel NA, Alpert MD, Cheng E, Noy G, Samuelson S, Sreshta N, Boyd JW, 2020. Availability of Buprenorphine Treatment in the 10 States With the Highest Drug Overdose Death Rates in the United States 26, 6.
- Ghertner R, 2019. U.S. trends in the supply of providers with a waiver to prescribe buprenorphine for opioid use disorder in 2016 and 2018. *Drug Alcohol Depend* 204, 107527. 10.1016/j.drugalcdep.2019.06.029
- Guerrero EG, Kao D, Perron BE, 2013. Travel distance to outpatient substance use disorder treatment facilities for Spanish-speaking clients. *Int J Drug Policy* 24, 38–45. 10.1016/j.drugpo.2012.04.004 [PubMed: 22705358]
- Haffajee RL, Lin LA, Bohnert ASB, Goldstick JE, 2019. Characteristics of US Counties With High Opioid Overdose Mortality and Low Capacity to Deliver Medications for Opioid Use Disorder. *JAMA Netw Open* 2, e196373–e196373. 10.1001/jamanetworkopen.2019.6373
- Hedegaard H, Miniño AM, Warner M. Drug overdose deaths in the United States, 1999–2018. NCHS Data Brief, no 356. Hyattsville, MD: National Center for Health Statistics. 2020., n.d.
- Iloglu S, Joudrey PJ, Wang EA, Thornhill TA, Gonsalves G, 2021. Expanding access to methadone treatment in Ohio through federally qualified health centers and a chain pharmacy: A geospatial modeling analysis. *Drug Alcohol Depend* 220, 108534. 10.1016/j.drugalcdep.2021.108534
- Jones A, Honeremann B, Sharp A, Millett G. Where multiple forms of medication-assisted treatment are available. *Health Affairs Blog*. doi:10.1377/HBLOG20180104.835958. [WWW Document], n.d. URL <https://www.healthaffairs.org/doi/10.1377/hblog20180104.835958/full/> (accessed 9.6.20).
- Jones CM, Campopiano M, Baldwin G, McCance-Katz E, 2015. National and State Treatment Need and Capacity for Opioid Agonist Medication-Assisted Treatment. *Am J Public Health* 105, e55–63. 10.2105/AJPH.2015.302664
- Joudrey PJ, Edelman EJ, Wang EA, 2019. Drive Times to Opioid Treatment Programs in Urban and Rural Counties in 5 US States. *JAMA* 322, 1310–1312. 10.1001/jama.2019.12562 [PubMed: 31573628]
- Kao D, Torres LR, Guerrero EG, Mauldin RL, Bordnick PS, 2014. Spatial accessibility of drug treatment facilities and the effects on locus of control, drug use, and service use among heroin-injecting Mexican American men. *Int J Drug Policy* 25, 598–607. 10.1016/j.drugpo.2013.12.012 [PubMed: 24440123]
- Kleinman RA, 2020. Comparison of Driving Times to Opioid Treatment Programs and Pharmacies in the US. *JAMA Psychiatry*. 10.1001/jamapsychiatry.2020.1624
- Langabeer JR, Stotts AL, Cortez A, Tortolero G, Champagne-Langabeer T, 2020. Geographic proximity to buprenorphine treatment providers in the U.S. *Drug and Alcohol Dependence* 213, 108131. 10.1016/j.drugalcdep.2020.108131

- Larochelle MR, Bernson D, Land T, Stopka TJ, Wang N, Xuan Z, Bagley SM, Liebschutz JM, Walley AY, 2018. Medication for Opioid Use Disorder After Nonfatal Opioid Overdose and Association With Mortality. *Annals of Internal Medicine* 169, 137–145. 10.7326/M17-3107 [PubMed: 29913516]
- McBain RK, Dick A, Sorbero M, Stein BD, 2020. Growth and Distribution of Buprenorphine-Waivered Providers in the United States, 2007–2017. *Ann. Intern. Med.* 172, 504–506. 10.7326/M19-2403 [PubMed: 31905379]
- McBournie A, Duncan A, Connolly E, Rising J, 2019. Methadone Barriers Persist, Despite Decades Of Evidence [WWW Document]. *Health Affairs Blog*. URL <https://www.healthaffairs.org/doi/10.1377/hblog20190920.981503/full/> (accessed 9.10.21).
- Mohlman MK, Tanzman B, Finison K, Pinette M, Jones C, 2016. Impact of Medication-Assisted Treatment for Opioid Addiction on Medicaid Expenditures and Health Services Utilization Rates in Vermont. *Journal of Substance Abuse Treatment* 67, 9–14. 10.1016/j.jsat.2016.05.002 [PubMed: 27296656]
- Mojtabai R, Mauro C, Wall MM, Barry CL, Olfson M, 2019. Medication Treatment For Opioid Use Disorders In Substance Use Treatment Facilities. *Health Affairs* 38, 14–23. 10.1377/hlthaff.2018.05162 [PubMed: 30615514]
- Morgan JR, Schackman BR, Leff JA, Linas BP, Walley AY, 2018. Injectable naltrexone, oral naltrexone, and buprenorphine utilization and discontinuation among individuals treated for opioid use disorder in a United States commercially insured population. *J Subst Abuse Treat* 85, 90–96. 10.1016/j.jsat.2017.07.001 [PubMed: 28733097]
- National Survey of Substance Abuse Treatment Services (N-SSATS), 2016. 2016. https://www.dasis.samhsa.gov/dasis2/nssats/NSSATS_2016/2016_nssats_puf_codebook.pdf, n.d.
- ODMAP, 2020. Overdose Detection Mapping Application Program - [WWW Document]. URL <http://www.odmap.org/> (accessed 7.27.20).
- Olfson M, Zhang V, Schoenbaum M, King M, 2020. Trends in Buprenorphine Treatment in the United States, 2009–2018. *JAMA* 323, 276–277. 10.1001/jama.2019.18913 [PubMed: 31961408]
- Olsen Y, Fitzgerald RM, Wakeman SE, 2021. Overcoming Barriers to Treatment of Opioid Use Disorder. *JAMA*. 10.1001/jama.2021.1741
- Patrick SW, Richards MR, Dupont WD, McNeer E, Buntin MB, Martin PR, Davis MM, Davis CS, Hartmann KE, Leech AA, Lovell KS, Stein BD, Cooper WO, 2020. Association of Pregnancy and Insurance Status With Treatment Access for Opioid Use Disorder. *JAMA Netw Open* 3, e2013456–e2013456. 10.1001/jamanetworkopen.2020.13456
- Rosenblum A, Cleland CM, Fong C, Kayman DJ, Tempalski B, Parrino M, 2011. Distance Traveled and Cross-State Commuting to Opioid Treatment Programs in the United States. *Journal of Environmental and Public Health* 2011, e948789. 10.1155/2011/948789
- Samples H, Williams AR, Crystal S, Olfson M, 2020. Impact Of Long-Term Buprenorphine Treatment On Adverse Health Care Outcomes In Medicaid. *Health Affairs* 39, 747–755. 10.1377/hlthaff.2019.01085 [PubMed: 32364847]
- Stein BD, Pacula RL, Gordon AJ, Burns RM, Leslie DL, SORBERO MJ, BAUHOFF S, MANDELL TW, DICK AW, 2015. Where Is Buprenorphine Dispensed to Treat Opioid Use Disorders? The Role of Private Offices, Opioid Treatment Programs, and Substance Abuse Treatment Facilities in Urban and Rural Counties. *Milbank Q* 93, 561–583. 10.1111/1468-0009.12137 [PubMed: 26350930]
- Stein BD, Sorbero M, Dick AW, Pacula RL, Burns RM, Gordon AJ, 2016. Physician Capacity to Treat Opioid Use Disorder With Buprenorphine-Assisted Treatment. *JAMA* 316, 1211–1212. 10.1001/jama.2016.10542 [PubMed: 27654608]
- Substance Abuse and Mental Health Services Administration, 2020. FAQs: Provision of methadone and buprenorphine for the treatment of Opioid Use Disorder in the COVID-19 emergency [WWW Document]. URL <https://www.samhsa.gov/sites/default/files/faqs-for-oud-prescribing-and-dispensing.pdf>
- Substance Abuse and Mental Health Services Administration. (2019). Key substance use and mental health indicators in the United States: Results from the 2018 National Survey on Drug Use and Health (HHS Publication No. PEP19–5068, NSDUH Series H-54). Rockville, MD: Center

- for Behavioral Health Statistics and Quality, Substance Abuse and Mental Health Services Administration. Retrieved from <https://www.samhsa.gov/data/>, n.d.
- Substance Abuse and Mental Health Services Administration. (2020). Key substance use and mental health indicators in the United States: Results from the 2019 National Survey on Drug Use and Health (HHS Publication No. PEP20-07-01-001, NSDUH Series H-55). Rockville, MD: Center for Behavioral Health Statistics and Quality, Substance Abuse and Mental Health Services Administration. Retrieved from <https://www.samhsa.gov/data/>, n.d.
- Swensen ID, 2015. Substance-abuse treatment and mortality. *Journal of Public Economics* 122, 13–30. 10.1016/j.jpube.2014.12.008
- Thomas CP, Doyle E, Kreiner PW, Jones CM, Dubenitz J, Horan A, Stein BD, 2017. Prescribing patterns of buprenorphine waived physicians. *Drug and Alcohol Dependence* 181, 213–218. 10.1016/j.drugalcdep.2017.10.002 [PubMed: 29096292]
- U.S. Department of Health and Human Service Office of Inspector General. Geographic Disparities Affect Access to Buprenorphine Services for Opioid Use Disorder. January 2020, OEI- 12- 17- 00240, [oig.hhs.gov/oei/reports/oei- 12- 17- 00240.asp](https://oig.hhs.gov/oei/reports/oei-12-17-00240.asp), n.d.
- Volkow ND, 2020. Collision of the COVID-19 and Addiction Epidemics. *Ann Intern Med.* 10.7326/M20-1212
- Volkow ND, Frieden TR, Hyde PS, Cha SS, 2014. Medication-Assisted Therapies — Tackling the Opioid-Overdose Epidemic. *New England Journal of Medicine* 370, 2063–2066.
- Wakeman SE, Larochelle MR, Ameli O, Chaisson CE, McPheeters JT, Crown WH, Azocar F, Sanghavi DM, 2020. Comparative Effectiveness of Different Treatment Pathways for Opioid Use Disorder. *JAMA Netw Open* 3, e1920622–e1920622. 10.1001/jamanetworkopen.2019.20622
- Weimer MB, Wakeman SE, Saitz R, 2021. Removing One Barrier to Opioid Use Disorder Treatment: Is It Enough? *JAMA.* 10.1001/jama.2021.0958
- Yarbrough CR, Abraham AJ, Adams GB, 2020. Relationship of County Opioid Epidemic Severity to Changes in Access to Substance Use Disorder Treatment, 2009–2017. *Psychiatr Serv* 71, 12–20. 10.1176/appi.ps.201900150 [PubMed: 31575353]

Highlights

- In 2020 45% of counties had a facility offering any MOUD.
- In 2020, 9% of counties had a facility offering all forms of MOUD.
- In 2020, 83% of individuals are 10 miles from a facility offering MOUD treatment.
- More population dense areas have higher rates of facilities providing MOUD.

**Figure 1.**

1a: Share of facilities offering types of MOUD (2014–2020)

1b: Share of counties offering types of MOUD (2014–2020)

Notes: MOUD includes buprenorphine, methadone and naltrexone. In Panel A, the yellow line indicates the share of facilities that report offering at least one form of MOUD in each year. The grey line indicates the share of facilities that report offering two or more forms of MOUD treatment. The orange line indicates the share of facilities that offer all three forms of MOUD over time. In Panel B, each line corresponds to the share of counties with a facility providing access to MOUD treatment.

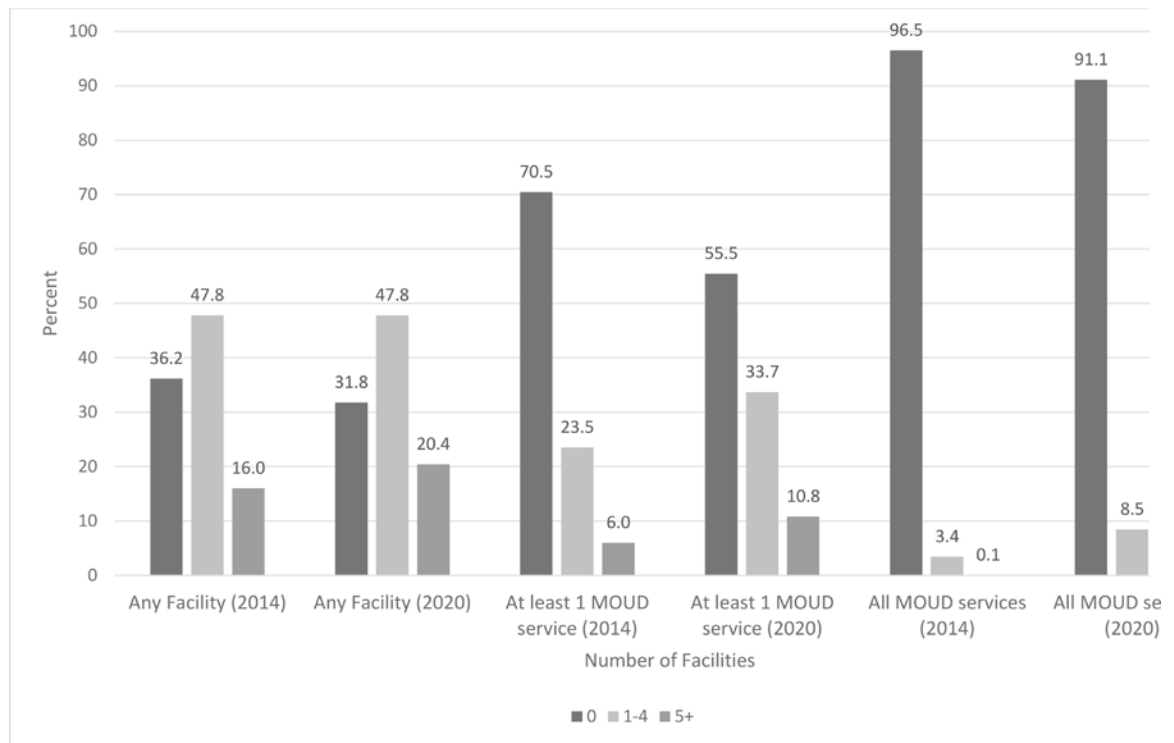


Figure 2:
County-Level Measures for Facilities and MOUD

Notes: Each bar represents the percentage of counties with 0, 1–4, or 5+ treatment facilities meeting criteria listed at base.

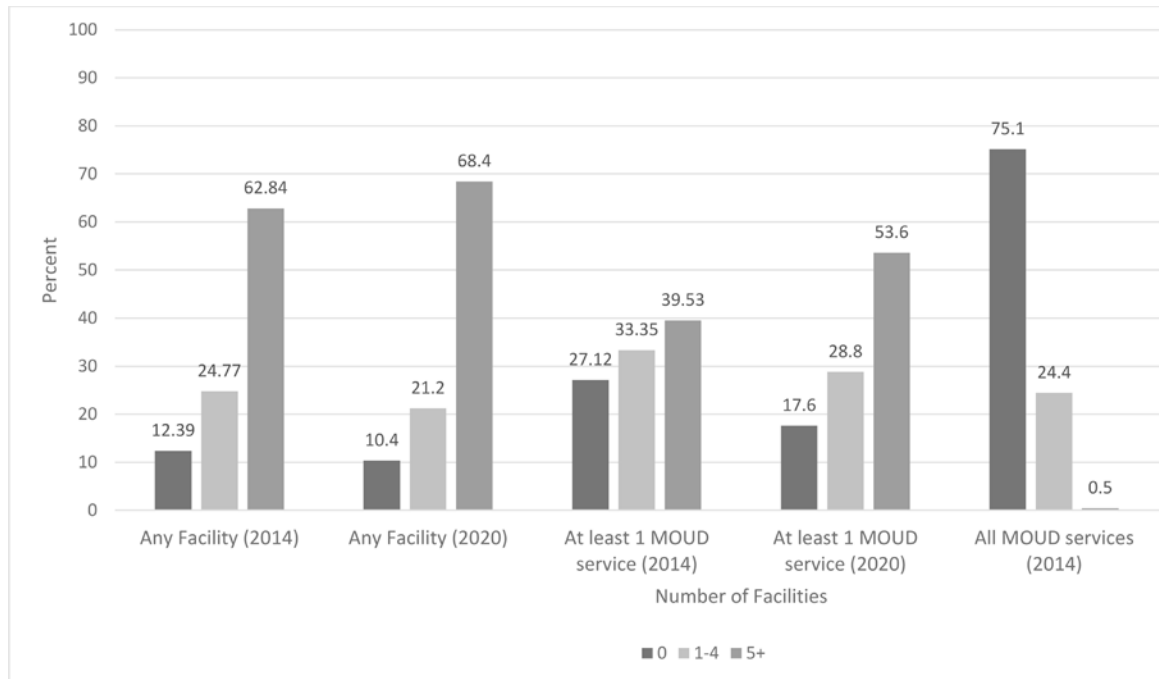


Figure 3:

Percent of population by Census Block Group with a Treatment Facility within 10-miles

Notes: Each bar represents the percentage of the population within 10 miles of 0, 1–4, or 5+ treatment facilities meeting criteria listed at base.

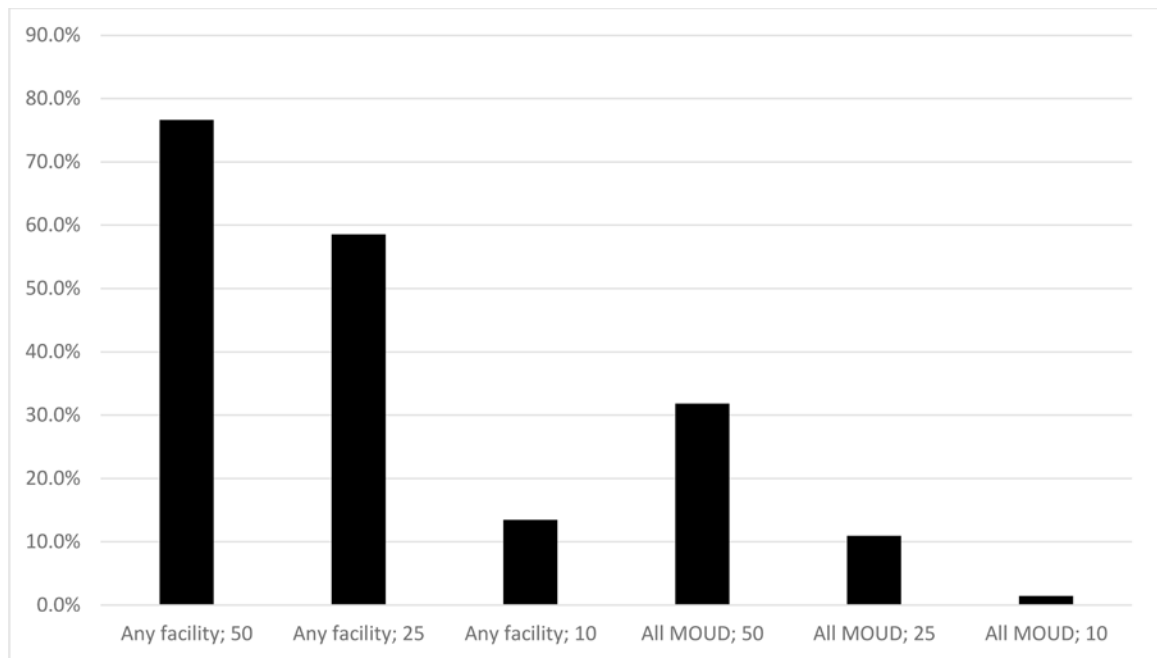


Figure 4:
Share of the country that does not have a facility in the county but within 10-, 25-, and 50-miles in 2020

Notes: Denominator is the total population of counties that do not have a treatment facility in the county. The numerator is the total population that does not have a facility in their county but does have a facility within 10-, 25- and 50-miles from the centroid of their census tract.