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Has the treatment gap for opioid use disorder narrowed in the U.S.?: A yearly assessment from 2010 to 2019”

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Abstract

Background: The United States overdose crisis continues unabated. Despite efforts to increase capacity for treating opioid use disorder (OUD) in the U.S., how actual treatment receipt compares to need remains unclear. In this cross-sectional study, we estimate progress in addressing the gap between OUD prevalence and OUD treatment receipt at the national and state levels from 2010 to 2019.

Methods: We estimated past-year OUD prevalence rates based on the U.S. National Survey on Drug Use and Health (NSDUH), using adjustment methods that attempt to account for OUD underestimation in national household surveys. We used data from specialty substance use treatment records and outpatient pharmacy claims to estimate the gap between OUD prevalence and number of persons receiving medications for opioid use disorder (MOUD) during the past decade.

Results: Adjusted estimates suggest past-year OUD affected 7,631,804 individuals in the U.S. in (2,773 per 100,000 adults 12+), relative to only 1,023,959 individuals who received MOUD (365 per 100,000 adults 12+). This implies approximately 86.6% of individuals with OUD nationwide who may benefit from MOUD treatment do not receive it. MOUD receipt increased across states over the past decade, but most regions still experience wide gaps between OUD prevalence and MOUD receipt.

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Ethics approval

The authors declare that they have obtained ethics approval from an appropriately constituted ethics committee/institutional review board where the research entailed animal or human participation.

Declaration of interests

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests: Dr. Keyes reports personal fees for consultation and testimony in litigation.

Conclusions: Despite some progress in expanding access to MOUD, a substantial gap between OUD prevalence and treatment receipt highlights the critical need to increase access to evidence-based services.

Keywords

Medications for opioid use disorder; Treatment gap; Opioid use disorder; Methadone; Buprenorphine; overdose

Introduction

Two decades after initial reports of rising overdose deaths, the U.S. overdose epidemic continues to accelerate. The COVID-19 pandemic has exacerbated this crisis, leading to historically high overdose deaths in 2020, with provisional data indicating continued increases in 2021 (Ahmad FB et al., 2022). Opioids continue to be the central driver of overdose deaths, involved in three quarters of past-year deaths, with unregulated fentanyl – a potent synthetic illicit opioid – being the primary driver (O’Donnell et al., 2021). Despite numerous federal and state initiatives to address overdose deaths (Grogan et al., 2020), such efforts have been slow to keep pace with the escalation of the crisis.

Particularly challenging to the overdose response has been expanding access to evidence-based treatment for opioid use disorder (OUD). Methadone, buprenorphine, and extended-release naltrexone are three FDA-approved medications for OUD (MOUD) that are consistently associated with improved health outcomes, including reduced opioid use, transmission of HIV and Hepatitis-C, and overdose risk (Leshner & Mancher, 2019). Population-based studies have found that compared to no-treatment or treatments not involving medications, MOUD decreases overdose risk by over 50% (Santo et al., 2021). While methadone can only be dispensed by certified opioid treatment programs (OTPs), buprenorphine can be prescribed by providers waived under the Drug Addiction Treatment Act of 2000 (DATA 2000). Naltrexone can be administered several ways, including via a monthly injection by any provider so long as it falls within their scope of practice, but is used primarily for alcohol use disorder and less often for OUD treatment (Volkow & Blanco, 2020).

Despite their effectiveness, low utilization of MOUD has limited their public health impact. Prior research and policy initiatives have focused largely on the need to increase treatment capacity for MOUD to expand access. In 2012, 96% of states had OUD rates higher than their buprenorphine treatment capacity rates and 77.6% of states reported at least 75% of OTPs were operating at 80% capacity or greater (Jones et al., 2015). Since 2012, MOUD treatment capacity has increased inconsistently across the U.S (Abraham et al., 2020; Alderks, 2017).

While evidence of some expansion of treatment capacity is encouraging, overdose deaths continue to rise, and a gap remains in our understanding of how actual MOUD receipt – rather than treatment capacity alone – has kept pace with U.S. OUD trends. This is particularly important given that only half of waived providers actively prescribe buprenorphine (Duncan et al., 2020), indicating treatment capacity may overestimate actual

access to care. Particularly challenging to our understanding of this issue is that data on treatment receipt for methadone, buprenorphine and naltrexone is collected via disjointed databases. Many have instead relied on self-reported estimates from the household-based National Survey on Drug Use and Health to assess treatment receipt, yet this survey is based on self-report and excludes many hard-to-reach and institutionalized populations (Johnson, 2014; Reuters 2021). Moreover, there is a need to better understand where gaps in MOUD receipt are concentrated across U.S. states and how these gaps have shifted over time.

In this study, we combined data on real-world treatment receipt from multiple sources, along with multiplier-adjusted estimates of OUD prevalence (Keyes et al., 2022) to calculate the “treatment gap” between OUD prevalence and receipt of evidence-based MOUD treatment at the national and state levels over the past 10 years. Such estimates are key to informing policy and practice priorities to address the overdose crisis.

Methods

Reporting followed STROBE guidelines for observational studies (von Elm et al., 2007).

Estimating OUD prevalence using NSDUH data

Cross-sectional national and state prevalence estimates for past-year OUD were obtained using publicly-available data from the National Survey on Drug Use and Health (NSDUH), which surveys U.S. household residents aged 12 years or older. We obtained annual national weighted prevalence rates for years 2010 through 2019 and state prevalence rates for the most recent available aggregated year-pair data for 2018–2019 (Substance Abuse and Mental Health Services Administration Center for Behavioral Health Statistics and Quality, 2020). Past-year OUD prevalence estimates include individuals who met diagnostic criteria for past-year abuse or dependence of opioid pain relievers, heroin, or both, based on questions modeled after DSM-IV opioid abuse or dependence criteria. In 2015, the NSDUH implemented methodological changes in the measurement of prescription pain medication, (Center for Behavioral Health Statistics and Quality, 2018) and thus annual national past-year OUD estimates from 2010 to 2014 and 2015 to 2019 are presented separately.

While the NSDUH is a nationally representative survey, it is likely to substantially underestimate the true U.S. prevalence of OUD. This is because it is based on participant self-report of substance use but also because it excludes non-housed populations who have high rates of OUD, such as individuals who are homeless, incarcerated, or otherwise institutionalized (Johnson, 2014; Reuters, 2021). In fact, a capture-recapture study in Massachusetts estimated that state OUD rates in 2015 were 4.49 times higher than those that had been estimated by the NSDUH (Barocas et al., 2018). To account for this underestimation, we used the Massachusetts multiplier of 4.49 to calculate adjusted national and state-specific OUD prevalence rates (see Keyes et al., 2022 for details of methodology).

Sensitivity analysis: estimating OUD prevalence using multiplier with correction for drug poisoning deaths

As the approach described above only uses a multiplier derived from one state and which may not be consistent across all U.S. regions, we conducted a sensitivity analysis using a

third estimate of state-level OUD prevalence derived from an alternate adjustment approach that uses state drug overdose deaths rather than NSDUH data. Such estimates utilize the formula of $y = d / (0.0156 p + 0.0052(1-p))$, where y is the estimated OUD population, d is the number of drug overdose deaths as reported by CDC (CDC National Center for Health Statistics, 2021) and p is the proportion of deaths that involved a synthetic opioid (see Keyes et al. for full details on prevalence estimation methodology). We compared estimates from the unadjusted and adjusted NSDUH prevalence estimates above to those derived using this approach (Appendix Table 1).

Estimating MOUD treatment receipt

We used multiple sources to obtain point prevalence estimates for MOUD receipt during the study period. National and state counts for individuals receiving MOUD in OTPs were obtained using the National Survey of Substance Abuse Treatment Services (NSSATS), an annual survey conducted by the Substance Abuse and Mental Health Services Administration. NSSATS captures information on all known U.S. public and privately-funded substance use treatment facilities (Substance Abuse and Mental Health Services Administration, 2020). We obtained data on the number of persons receiving care from OTPs, reported by NSSATS as a point prevalence of persons active in treatment on the date the survey was conducted (alternates yearly between March 29 to 31st). NSSATS did not report the number of individuals receiving care from OTPs in 2014 and 2018, so we imputed this number using the average of the preceding and succeeding years. While the majority of treatment from OTPs involves methadone, NSSATS also counts persons receiving OUD treatment in OTPs who were dispensed buprenorphine or naltrexone.

National and state counts for individuals receiving buprenorphine dispensed in pharmacies were obtained using the IQVIA LRx database, which includes all-payer prescriptions from outpatient retail pharmacies, excluding long-term care and mail-order prescriptions (IQVIA Xponent Database 2010–2019, 2021). Given MOUD dispensed directly from an OTP does not pass through outpatient retail pharmacies, most patients captured in NSSATS data are not included in the IQVIA counts. Prescriptions included buprenorphine formulations utilized primarily in the treatment of OUD including Bunavail, Sublocade[®], Suboxone[®], Zubsolv[®], Subutex[®], and generic formulations of these products (i.e., buprenorphine/naloxone and buprenorphine). Buprenorphine products approved by FDA for treatment of pain were excluded. The total number of persons receiving buprenorphine was estimated as the point prevalence of persons with an active prescription on the same day of that year's N-SSATS survey based on methods used in prior analyses combining NSSATS and IQVIA treatment utilization estimates (Krawczyk et al., 2021).

To obtain an estimate of total persons receiving MOUD, we added the number of individuals receiving dispensed buprenorphine from pharmacies with those receiving any MOUD from OTPs on the selected March date. MOUD treatment rates were calculated per 100,000 people in the population 12+ using CDC population counts for the population denominator (CDC National Center for Health Statistics, 2021). To estimate the gap between OUD prevalence and MOUD treatment need, we calculated the proportion of individuals receiving MOUD relative to adjusted NSDUH estimates of OUD prevalence. Given naltrexone is

primarily used in the treatment of alcohol use disorder rather than OUD, and we could not obtain information on patient diagnosis from pharmacy records, we excluded naltrexone from our primary calculations of MOUD receipt. We did conduct sensitivity analyses using MOUD receipt estimates inclusive of extended-release naltrexone (Vivitrol®) pharmacy records (numbers are available in Fig. 2 and Appendix Table 2); however, incorporating these records did not substantially change rates of MOUD receipt or MOUD treatment gap estimates.

Estimating changes in MOUD treatment receipt over time

To obtain estimates of changes in MOUD treatment receipt rates over time, we calculated the percent change in national and state-specific rates of persons receiving MOUD over the past year (2018 to 2019) and past decade (2010 to 2019), using rates per 100,000 population 12+.

We conducted all analyses with SAS Version 9.4 and Microsoft Excel 2018. This study used de-identified secondary claims data and data from publicly available sources and the NYU Langone Institutional Review Board exempted it from review.

Results

National trends in OUD and MOUD receipt

National trends in past-year OUD prevalence and MOUD receipt from 2010 to 2014 and 2015 to 2019 are presented in Fig. 1 with numerical estimates, rates and 95% confidence intervals (CI) presented in Table 1. Using unadjusted NSDUH data, 2,105,757 individuals (830.3 per 100,000 12+, 95% CI: 718.7–941.9) were estimated to have past-year OUD in 2010, and 2,269,135 individuals (855.9 per 100,000, 95% CI: 752.6–959.1) were estimated to have past-year OUD in 2014. There were 2,412,106 individuals (901.1 per 100,000, 95% CI: 796.6–1005.6) estimated to have past-year OUD in 2015, and 1,700,870 (618.0 per 100,000, 95% CI: 522.6–713.4) in 2019. Based on multiplier-adjusted NSDUH data, prevalence estimates were much higher with 9,448,532 individuals (3,725.5 per 100,000, 95% CI: 3,137.5–4,313.5) estimated to have past-year OUD in 2010, and 10,181,609 individuals (3,840.3 per 100,000, 95% CI: 3,428.7–4,251.9) estimated to have past-year OUD in 2014. There were 10,823,120 individuals (4,043.1 per 100,000, 95% CI: 3,611.9–4,474.3) estimated to have past-year OUD in 2015, and 7,631,804 (2,773 per 100,000, 95% CI: 2,341.8–3,204.2) in 2019.

Overall, there was a 105.6% increase in the rate of MOUD receipt across the U.S. from 2010 to 2019, and a 4.9% increase from 2018 to 2019. The number of individuals receiving any MOUD via OTPs or pharmacies increased from 462,047 individuals (177.8 per 100,000) in 2010 to 1,023,959 individuals (365.4 per 100,000) in 2019 (Table 1). As shown in Fig. 2 and Appendix Table 2, this trend was primarily driven by increases in the number of individuals receiving pharmacy-dispensed buprenorphine, which increased more than three-fold from 2010 to 2019. Using adjusted estimates of past-year OUD prevalence, there was a gap in MOUD receipt for 8,986,485 individuals, or 95.1% of individuals with OUD not receiving

MOUD in 2010 (95% C.I.: 94.2–95.8), and 6,607,845 individuals, or 86.6% of individuals with OUD not receiving MOUD in 2019 (95% CI:84.1–88.4) (Table 1).

State-level trends in OUD and MOUD receipt

State-level estimates of past-year OUD prevalence using unadjusted and multiplier-adjusted NSDUH data from 2018 to 2019 and state-level data on MOUD receipt in 2019 are presented in Table 2. Past-year OUD rates were highest in Washington, D.C. (unadjusted rate 1,804 per 100,000 12+; adjusted rate 8,100 per 100,000) and lowest in Minnesota (unadjusted rate 167.4 per 100,000; adjusted rate 751.8 per 100,000).

The MOUD treatment receipt rate in 2019 was lowest in South Dakota with 66.1 per 100,000 persons receiving MOUD, and highest in Vermont, with 1,342.6 per 100,000 persons receiving MOUD. Thirty seven (72.5%) states and Washington, D.C. had more persons receiving MOUD via pharmacy-dispensed buprenorphine than from OTPs. When using the unadjusted prevalence estimates, 12 states had greater rates of MOUD treatment receipt than estimated rates of past-year OUD. This was greatest in Connecticut, Maryland and Rhode Island, where the number of individuals receiving MOUD was approximately double that of the population estimated to have past-year OUD. When using multiplier-adjusted OUD prevalence estimates, however, all 50 states and D.C. had rates of past-year OUD prevalence greater than rates of MOUD treatment receipt. The largest gap was seen in Iowa, North Dakota and D.C., with a respective gap of 97.3%, 96.1% and 95.1% of individuals with past-year OUD estimated to not receive MOUD. The smallest gap was seen in Connecticut, Maryland and Rhode Island, with a respective 53.9%, 58.1%, and 58.6% of individuals with OUD estimated to not receive MOUD.

Between 2010 and 2019, all fifty states experienced increases in MOUD treatment rates, with the greatest percent change in MOUD receipt seen in South Dakota (1846.7%), North Dakota (904.3%) and Alaska (422.4%). Only Washington, D.C. experienced a decrease in rate of MOUD receipt of –9.2%. Between 2018 and 2019, 86% of all states and Washington, D.C. experienced increases in MOUD receipt rates, with the greatest increase seen in North Dakota (38.5%), South Dakota (33.8%) and Colorado (18.5%). Relative decreases in MOUD receipt between 2018 and 2019, while small, were seen in Montana (–2.8%), Kansas (–2.4%) and Tennessee (–1.2%). Nationwide and state counts and rates of MOUD receipt in 2010 and 2018 used in percent change calculations are presented in Appendix Table 3.

Sensitivity analyses using state-level past-year OUD prevalence estimates using the alternative multiplier with correction for drug overdose deaths are presented in Appendix Table 1. OUD prevalence estimates using this method generally lied between the unadjusted and adjusted OUD estimates presented above, but exceeded the adjusted estimates in twenty of the 51 states and Washington, D.C. Thus, even when accounting for variation at the state level for which a constant multiplier from Massachusetts may not apply, the gap between OUD prevalence and MOUD receipt in most states remained high.

Discussion

Study findings highlight a concerning and persistent gap in OUD treatment receipt across the U.S. Despite a steady increase in the number of individuals who received MOUD over the past decade, the pace of growth in treatment utilization has not kept up with persistently-high rates of OUD and overdose deaths. While point estimates imply a decline in past-year OUD prevalence after 2015, confidence intervals often overlap across years, and changes to the definition of OUD made to NSDUH in 2015 make estimates across this time period difficult to compare. It is also possible that the decline reflects some individuals' transition from prescription opioid to heroin use, as NSDUH is known to particularly under-capture illicit opioid use (Reuter 2021). Lower OUD prevalence may also relate to some individuals' enrollment in treatment or reduced symptomology rather than reduced need of OUD care. The current study contributes novel estimates of the MOUD treatment gap by using real-world administrative data on treatment receipt rather than estimates of treatment capacity. Importantly, we incorporated adjusted prevalence estimates of OUD to account for what are likely significant underestimates of population-based past-year OUD prevalence estimates using household survey data. Using adjusted estimates for OUD prevalence, we estimate that in 2019, approximately 84–88% of individuals with past-year OUD nationwide who could benefit from MOUD did not receive this life-saving treatment. This complements and corroborates prior self-report findings from 2019 NSDUH participants, in which 82% of people with past-year OUD did not endorse having received any MOUD (Substance Abuse and Mental Health Administration, 2020).

State-specific findings indicate wide variation in past-year OUD prevalence and MOUD treatment gaps across U.S. regions. Findings also demonstrate distinct growth patterns in MOUD over the past decade, with some states experiencing little change over the past decade, while others, especially those which had little to no MOUD treatment availability a decade ago, experiencing a substantial relative increase in treatment receipt. State findings additionally reflect what are likely significant underestimates of past-year OUD by the NSDUH, as multiple states reported a greater number of individuals receiving MOUD than estimated to have past-year OUD. When estimating rates of past-year OUD using multiplier-adjusted NSDUH estimates and multiplier with correction for drug overdose deaths, all states and Washington, D.C. had substantially lower treatment receipt than estimated treatment need, a likely more accurate reflection of the current gap in MOUD receipt.

Many factors contribute to a lack of sufficient MOUD receipt relative to need. First, there is a continued shortage of MOUD treatment providers and programs, especially in more remote and rural areas. Recent data show that 46% of counties lack an MOUD medication provider (Haffajee et al., 2019), and 32% have no specialty SUD treatment programs at all (Langabeer et al., 2019). Multiple strategies to expand the pool of buprenorphine prescribers have been proposed, including eliminating special waiver requirements and greater training of physicians and medical trainees (Saloner et al., 2021). In addition to improving supply, however, more efforts are needed to also increase volume of OUD patients among waived providers, many whom are not prescribing at all or to their maximum capacity (Duncan et al., 2020; Krawczyk et al., 2021) or who opt out from being publicly listed on

the buprenorphine locator tool (Ghertner & Ali, 2020). Providing funding incentives for buprenorphine providers or services such as case management and peer support may help encourage increased uptake of patients among existing providers (Saloner et al., 2021). In addition, system barriers such as lack of institutional support, provider stigma, and a lack of referral programs and integrated systems of care are additional hurdles (Jones et al., 2021). Models such as the Hub-and-Spoke, nurse care or collaborative care models may help to address these barriers and improve provision of MOUD (Brooklyn & Sigmon, 2017; LaBelle et al., 2016). Additionally, changes in COVID-19 regulations to allow for phone-initiation of buprenorphine have shown to be particularly beneficial in rural areas as a way to increase remote access to willing buprenorphine providers (Harris et al., 2020).

Efforts to expand access to MOUD via OTPs, which saw a slower relative growth in utilization over the past decade, may be stagnated by multiple legal hurdles that prevent establishment of new OTPs. These include exclusionary zoning restrictions or resource-prohibitive staffing requirements, as well as financial barriers such as lack of universal insurance coverage for OTP services (Pew Charitable Trusts, 2021). In addition to a stagnant supply of OTPs, slow growth in methadone receipt may reflect a preference for buprenorphine among patients given its availability in office-based treatment settings that may allow for a less stigmatizing experience, less frequent travel and better integration with other healthcare services (Frank, 2021). COVID-19-related changes to allow for longer methadone take-home doses and more flexible OTP policies may have the potential to significantly reduce such treatment burden (Krawczyk et al., 2020). Other proposed efforts to make methadone more accessible include expanding methadone medication units that can be integrated into other health settings, as well as establishing mobile methadone units to reach communities lacking access (Pew Charitable Trusts, 2021). More drastic shifts to methadone delivery, such as via community pharmacies and primary care, remain central to advocacy efforts around facilitating access and retention in methadone (Adams et al., 2022).

Critical to improving utilization of MOUD is also addressing hurdles that prevent people with OUD from receiving MOUD even when supply is available. There is a concerning proportion of individuals who seek treatment for OUD but do not receive medications as part of care. Studies shows that over 60% of those in outpatient OUD treatment and nearly 90% of those in residential OUD treatment do not receive any MOUD (Solomon et al., 2021). Particularly vulnerable populations such as those with justice involvement and youth are even less likely to receive MOUD (Cerdá et al., 2021) as MOUD is often highly stigmatized and considered a last-resort treatment. Ensuring programs that treat OUD offer and encourage use of MOUD is fundamental to increasing up-take of evidence-based treatment. In other instances, people with OUD who may have interest in treatment lack sufficient entryways into care. Novel efforts to expand initiation and linkage to MOUD via emergency departments, hospitals, and the criminal justice system are increasingly showing promise as touchpoints for linking people with both primary and specialty care systems, although more work is needed to enhance successful follow up and retention in care (“Treating Opioid Use Disorder in General Medical Settings, ” 2021). Moreover, addressing basic hurdles such as inability to cover copays for prescriptions or treatment (Morgan et al., 2022) remains critical to ensuring patients’ continued adherence to care.

Finally, the gap in MOUD receipt reflects an ongoing disconnect between available treatment options and the needs and desires of individuals with OUD. Many struggle to succeed in highly structured treatment settings that are often stigmatizing and punitive. Low-barrier MOUD treatment models, such as bridge clinics, mobile vans or co-located treatment within syringe service programs have all shown to be effective in engaging highly vulnerable patient populations (Jakubowski et al., 2021; Krawczyk et al., 2019). Despite growing attention to these programs, they are still not available at scale. Funding streams that can support expansion of MOUD in non-traditional settings as well as wrap around services that could help connect patients with other needed health and social services may better serve needs and goals of individuals with OUD. It is important to recognize that for a certain proportion people with OUD, seeking treatment may not always be a desired option. Thus, responses to the overdose crisis must ensure that other evidence-based harm reduction services are available to prevent drug-related harm and overdose, such as rapid access to naloxone, syringe service programs and overdose prevention sites (which remain unsanctioned by the federal government in the U.S.), as they can provide lifesaving care and a potential bridge to MOUD for participants who do choose to seek treatment (Pan & Wood, 2020).

Limitations

The current study is subject to limitations that stem largely from a limited ability to calculate precise estimates for OUD prevalence and MOUD utilization using existing data sources. First, estimates of past-year OUD prevalence were based on multiple approaches that each have their own set of limitations: Unadjusted national estimates from the NSDUH miss important populations with OUD, have been subject to some changes in OUD definitions over time, and are based on DSM IV diagnostic criteria that may differ from current guidelines on OUD based on DSM V. Multiplier approaches are limited in that they have been developed using assumptions based on OUD prevalence from the single state of Massachusetts and may not apply equally to all regions. Multiplier approaches used in sensitivity analyses do incorporate state-specific overdose data, but they are limited by inconsistent opioid overdose reporting on death certificates across states. Thus, there is an important need to improve data collection to estimate true OUD prevalence across many different regions and target populations. Second, the number of persons receiving MOUD was estimated from administrative records from the month of March, and may not reflect MOUD treatment volume at other times of the year or include information on length of treatment. Moreover, estimates of MOUD derived from OTP and IQVIA pharmacy data were collected from non-linked data sources on MOUD receipt: as such, persons may have been double counted if they received OTP-dispensed MOUD and pharmacy-dispensed MOUD on the same day data were extracted, or if they were prescribed buprenorphine at an OTP that was picked up at a community pharmacy but were still counted by NSSATS as OTP clients. Both of these scenarios would overestimate MOUD receipt and underestimate the MOUD treatment gap. Third, pharmacy data do not contain information on diagnosis, so some may have been prescribed buprenorphine for non-OUD diagnoses, although this is relatively rare. Lastly, OTP data are based on reporting of number of people in treatment by facilities that participate in the NSSATS, and therefore may be subject to missing data from non-participating OTPs and reporting error.

Conclusions

Despite important progress over the past decade to narrow the gap in MOUD receipt, our findings show a substantial treatment gap remains. Federal, state and local responses to the overdose crisis should continue to adopt policies that help narrow this gap, not only by facilitating greater availability of MOUD providers and treatment facilities, but also by focusing on promoting programs that can facilitate linkage to and provision of MOUD via more flexible modalities that are tailored to the needs and desires of individuals with OUD. COVID-19 related policy changes and recently proposed legislation (Senators Markey and Paul Introduce Bipartisan Legislation to Modernize, Improve Methadone Treatment Amid Skyrocketing Opioid Overdoses and Deaths, 2022) to allow more flexible and convenient access to MOUD may be an initial step towards expanding access to such life-saving treatment, and pending research will reveal longer term influences of these initiatives on the MOUD treatment access gap. Finally, improving initial access to MOUD is only the first step – our research and health systems have a long way to go in addressing the needs of people with OUD to support retention in treatment and services to effectively reduce overdose and improve long-term health and well-being.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Funding sources

This research received funding from the following sources.

Abbreviations:

OUD	Opioid use disorder
MOUD	Medications for opioid use disorder
OTP	Opioid treatment program
FDA	Food and Drug Administration
DEA	Drug Enforcement Administration
NSDUH	National Survey on Drug Use and Health
NSSATS	National Survey of Substance Abuse Treatment Services

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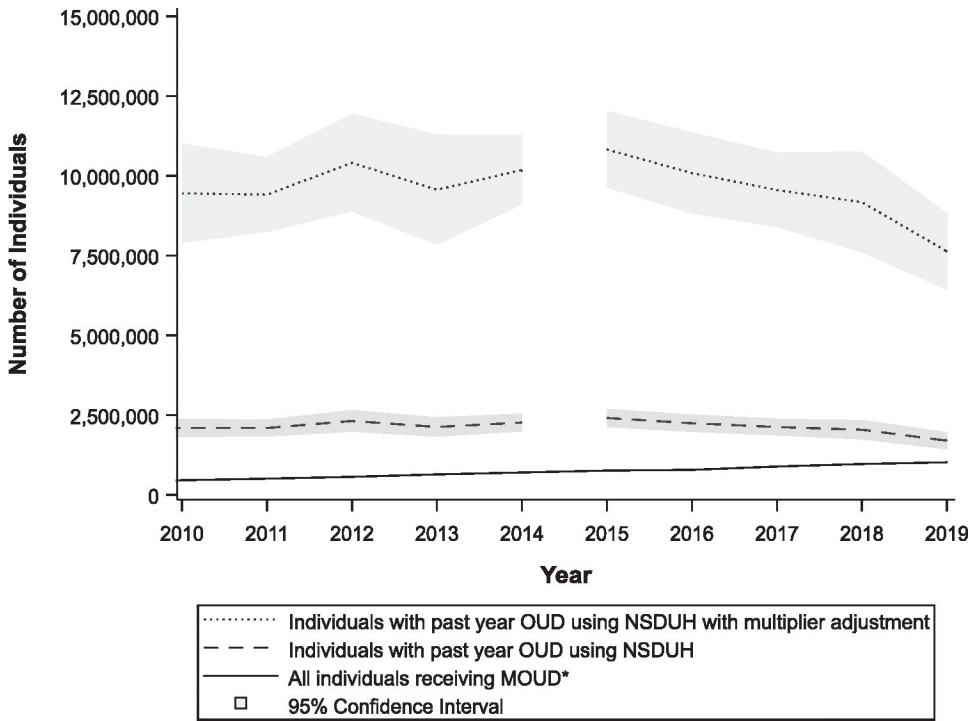


Fig. 1. Trends in past-year opioid use disorder and individuals receiving medications for opioid use disorder: United States, 2010–2019.

Source. Data are from the National Survey on Drug Use and Health, the National Survey of Substance Abuse Treatment Services, IQVIA LRx, Keyes et al. (2022).

Note. OTP = Opioid Treatment Program; MOUD = Medications for Opioid Use Disorder, NSDUH = National Survey on Drug Use and Health.

Prevalence trend line breaks in 2015 reflect the change in prescription pain reliever measurement, used to measure Opioid Use Disorder.

*Total patients receiving MOUD excludes naltrexone dispensed in pharmacies, see Appendix Table 1.

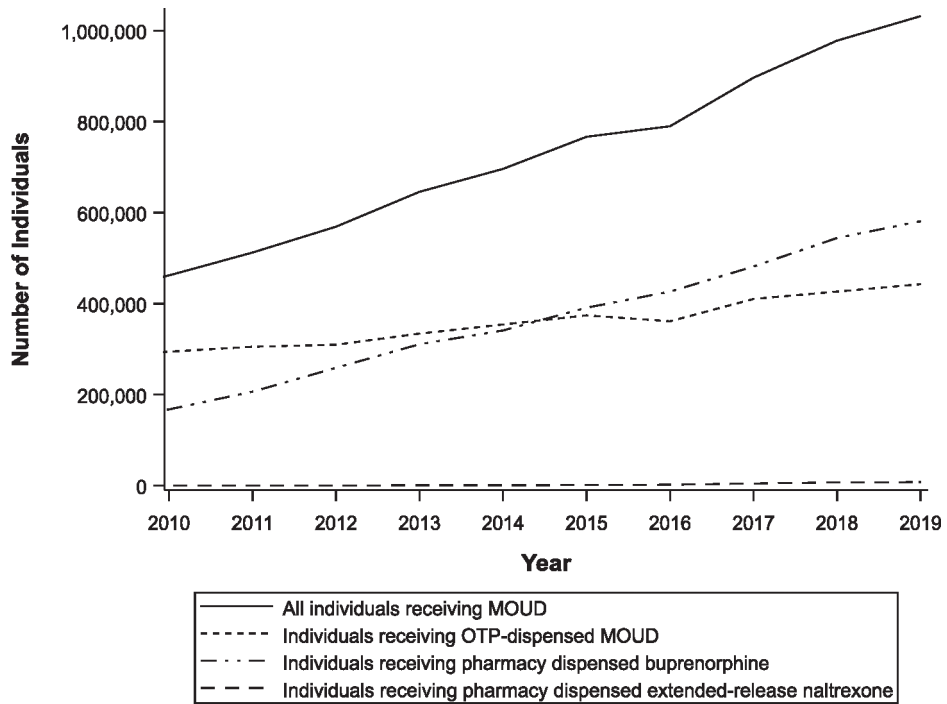


Fig. 2. Individuals receiving medications for opioid use disorder, including extended-release naltrexone: United States, 2010–2019. Source. Data are from the National Survey of Substance Abuse Treatment Services and IQVIA LRx. Note. N-SSATS did not report the number of patients receiving any MOUD in Opioid Treatment Programs in 2014 and 2018. To obtain these values, we used the average of the preceding and succeeding years.

Table 1

Past-Year Opioid Use Disorder (OUD) Prevalence and Individuals Receiving and not Receiving Medications for Opioid Use Disorder (MOUD) by Year. Rates are presented per 100,000 population age 12+, United States, 2010–2019.

Year	Unadjusted OUD prevalence using NSDUH		Adjusted OUD prevalence using NSDUH + multiplier		Individuals receiving MOUD ^{b,c}		No. and % of individuals with OUD not receiving MOUD using adjusted OUD prevalence	
	No. (95% CI)	Rate (95% CI)	No. (95% CI)	Rate (95% CI)	No.	Rate	No. (95% CI)	Percent (95% CI)
2010	2,105,757 (1,822,754, 2,388,760)	830.3 (718.7, 941.9)	9,448,532 (7,906,683, 11,003,019)	3,725.5 (3,137.5, 4,313.5)	462,047	177.8	8,986,485 (7,444,636, 10,540,972)	95.1 (94.2, 95.8)
2011	2,097,321 (1,837,662, 2,356,979)	814.2 (713.2, 915.2)	9,410,679 (8,249,279, 10,584,659)	3,653.2 (3,202.4, 4,104.0)	511,842	194.8	8,898,837 (7,737,437, 10,072,817)	94.6 (93.8, 95.2)
2012	2,319,213 (1,984,901, 2,653,525)	891.8 (763.4, 1020.2)	10,406,309 (8,892,072, 11,934,460)	4,001.5 (3,433.1, 4,569.9)	568,712	214.4	9,837,597 (8,323,360, 11,365,748)	94.5 (93.6, 95.2)
2013	2,130,957 (1,831,884, 2,430,030)	812.1 (698.1, 926.2)	9,561,604 (7,850,567, 11,285,426)	3,644.0 (2,977.6, 4,310.4)	645,015	241.1	8,916,589 (7,205,552, 10,640,411)	93.3 (91.8, 94.3)
2014	2,269,135 (1,995,155, 2,543,115)	855.9 (752.6, 959.1)	10,181,609 (9,111,867, 11,264,965)	3,840.3 (3,428.7, 4,251.9)	695,273	257.3	9,486,336 (8,416,594, 10,569,692)	93.2 (92.4, 93.8)
2015 ^a	2,412,106 (2,132,242, 2,691,969)	901.1 (796.6, 1005.6)	10,823,120 (9,638,508, 12,022,200)	4,043.1 (3,611.9, 4,474.3)	765,316	280.6	10,057,804 (8,873,192, 11,256,884)	92.9 (92.1, 93.6)
2016	2,247,523 (1,980,621, 2,514,426)	834.2 (735.1, 933.2)	10,084,636 (8,826,662, 11,356,095)	3,743.0 (3,272.6, 4,213.4)	787,708	287.0	9,296,928 (8,038,954, 10,568,387)	92.2 (91.1, 93.1)
2017	2,129,367 (1,871,149, 2,387,584)	782.6 (687.6, 877.5)	9,554,470 (8,401,939, 10,719,772)	3,511.3 (3,099.7, 3,922.9)	891,942	321.9	8,662,528 (7,509,997, 9,827,830)	90.7 (89.4, 91.7)
2018	2,044,469 (1,745,139, 2,343,799)	746.8 (637.7, 856.0)	9,173,532 (7,605,871, 10,753,460)	3,351.0 (2,782.6, 3,919.4)	970,831	348.3	8,202,701 (6,635,040, 9,782,629)	89.4 (87.2, 91.0)
2019	1,700,870 (1,438,043, 1,963,696)	618.0 (522.6, 713.4)	7,631,804 (6,445,983, 8,827,825)	2,773.0 (2,341.8, 3,204.2)	1,023,959	365.4	6,607,845 (5,422,024, 7,803,866)	86.6 (84.1, 88.4)

Note. MOUD=Medications for Opioid Use Disorder

Source. Unadjusted OUD prevalence from the National Survey on Drug Use and Health, adjusted OUD prevalence using Keyes et al. multiplier method, derived from capture-recapture data from the state of Massachusetts, (Barocas et al., 2018) which estimated OUD rates were 4.49 times higher than the NSDUH state-level estimates in 2015. Number of individuals receiving MOUD obtained by adding pharmacy dispensed buprenorphine from IQVIA and number of clients in opioid treatment programs using the National Survey of Substance Abuse Treatment Services.

^aIn 2015, NSDUH questions regarding prescription pain relievers were changed, prompting a new baseline for the measure, and any dependent measures, including opioid use disorder. As such, 2010–2014 and 2015–2019 estimates are not directly comparable

^bNSATS did not report number of individuals receiving any MOUD in opioid treatment programs in 2014 and 2018. To obtain these values, we took the average of the preceding and succeeding years.

^cTotal persons receiving MOUD excludes naltrexone dispensed in pharmacies, see Appendix Table 2.

Table 2

Number and Change in Rates of Past-Year Opioid Use Disorder (OUD) and Persons Receiving Medications for Opioid Use Disorder (MOUD) by State: United States, 2010–2019.

State	Unadjusted OUD prevalence using NSDUH, 2018–2019 No. (Rate)	Adjusted OUD prevalence using NSDUH + multiplier, 2018–2019 No. (Rate)	Total individuals receiving MOUD No. (Rate)	Percent change ^b in rate from 2010 to 2019	Percent change ^b in rate from 2018 to 2019
Alabama	44,000 (1,050.9)	197,560 (4,718.5)	23,897 (570.8)	110.0%	7.0%
Alaska	4,000 (656.9)	17,960 (2,949.7)	2,437 (400.2)	422.4%	12.3%
Arizona	51,000 (821.8)	228,990 (3,689.8)	19,390 (312.4)	111.3%	10.2%
Arkansas	11,000 (430.1)	49,390 (1931.4)	4,827 (188.8)	350.9%	16.0%
California	206,000 (612.3)	924,940 (2749)	64,566 (191.9)	59.3%	2.4%
Colorado	37,000 (749.6)	166,130 (3,365.6)	10,947 (221.8)	243.9%	18.5%
Connecticut	14,000 (450.7)	62,860 (2,023.9)	28,970 (932.7)	53.4%	11.1%
Delaware	10,000 (1,190.7)	44,900 (5,346.5)	8,590 (1,022.9)	147.7%	3.9%
D.C.	11,000 (1,804)	49,390 (8,100)	2,428 (398.2)	-9.2%	8.1%
Florida	169,000 (903.9)	758,810 (4,058.7)	50,258 (268.8)	94.8%	2.0%
Georgia	49,000 (545.2)	220,010 (2,447.8)	22,793 (253.6)	99.7%	1.6%
Hawaii	8,000 (660.6)	35,920 (2,965.9)	2,259 (186.5)	116.4%	-0.2%
Idaho	12,000 (802.5)	53,880 (3,603)	2,934 (196.2)	207.8%	10.8%
Illinois	50,000 (461.3)	224,500 (2,071.5)	26,729 (246.6)	69.4%	6.6%
Indiana	48,000 (841.4)	215,520 (3,777.7)	24,526 (429.9)	134.9%	7.8%
Iowa	21,000 (784.7)	94,290 (3,523.2)	2,514 (93.9)	235.8%	5.6%
Kansas	15,000 (611.8)	67,350 (2,747.1)	3,913 (159.6)	97.8%	-2.4%
Kentucky	55,000 (1,445)	246,950 (6,488.2)	31,047 (815.7)	389.3%	2.4%
Louisiana	35,000 (892.1)	157,150 (4,005.5)	15,418 (393)	114.5%	0.9%
Maine	15,000 (1,265.9)	67,350 (5,683.9)	11,609 (979.7)	69.7%	4.6%
Maryland	22,000 (426.1)	98,780 (1,913.3)	41,389 (801.7)	82.7%	1.7%
Massachusetts	45,000 (747.9)	202,050 (3,358.1)	50,354 (836.9)	112.8%	-0.7%
Michigan	33,000 (383.9)	148,170 (1,723.9)	32,717 (380.7)	119.0%	6.9%
Minnesota	8,000 (167.4)	35,920 (751.8)	11,048 (231.2)	126.8%	2.7%
Mississippi	11,000 (436.3)	49,390 (1,958.8)	6,774 (268.7)	170.9%	3.9%
Missouri	23,000 (439.3)	103,270 (1,972.4)	10,684 (204.1)	130.2%	10.9%

State	Unadjusted OUD prevalence using NSDUH, 2018–2019 No. (Rate)	Adjusted OUD prevalence using NSDUH + multiplier, 2018–2019 No. (Rate)	Total individuals receiving MOUD No. (Rate)	Percent change ^b in rate from 2010 to 2019	Percent change ^b in rate from 2018 to 2019
Montana	9,000 (980.8)	40,410 (4,403.9)	2,435 (265.4)	330.5%	-2.8%
Nebraska	5,000 (309.1)	22,450 (1,388)	1,546 (95.6)	100.9%	6.2%
Nevada	22,000 (839.1)	98,780 (3,767.6)	5,229 (199.4)	101.7%	7.2%
New Hampshire	9,000 (750.9)	40,410 (3,371.5)	9,142 (762.7)	156.6%	-0.6%
New Jersey	69,000 (905.7)	309,810 (4,066.6)	32,987 (433)	66.1%	2.3%
New Mexico	10,000 (559.5)	44,900 (2,512)	10,159 (568.4)	265.9%	1.3%
New York	77,000 (459.1)	345,730 (2,061.2)	77,303 (460.9)	38.1%	7.4%
North Carolina	60,000 (667.7)	269,400 (2,998.2)	39,413 (438.6)	140.8%	4.2%
North Dakota	7,000 (1,098.5)	31,430 (4,932.2)	1,230 (193)	904.3%	38.5%
Ohio	143,000 (1,429.9)	642,070 (6,420.2)	48,133 (481.3)	286.7%	3.5%
Oklahoma	17,000 (511.2)	76,330 (2,295.5)	11,028 (331.6)	146.9%	14.0%
Oregon	32,000 (877.2)	143,680 (3,938.8)	13,616 (373.3)	140.2%	12.0%
Pennsylvania	72,000 (649.7)	323,280 (2,917.3)	72,197 (651.5)	132.6%	8.5%
Rhode Island	5,000 (539.1)	22,450 (2,420.5)	9,290 (1,001.6)	110.7%	-0.6%
South Carolina	12,000 (271.5)	53,880 (1,219)	14,686 (332.3)	125.5%	6.4%
South Dakota	2,000 (271)	8,980 (1,216.6)	488 (66.1)	1846.7%	33.8%
Tennessee	50,000 (856.8)	224,500 (3847.1)	29,819 (511)	161.6%	-1.2%
Texas	51,000 (211.6)	228,990 (950.1)	32,711 (135.7)	71.1%	5.9%
Utah	14,000 (540.1)	62,860 (2,424.9)	9,458 (364.9)	68.1%	3.5%
Vermont	7,000 (1,270.5)	31,430 (5,704.7)	7,397 (1,342.6)	191.7%	6.6%
Virginia	48,000 (656.9)	215,520 (2,949.5)	21,980 (300.8)	160.2%	6.8%
Washington	57,000 (876.8)	255,930 (3,936.8)	31,050 (477.6)	193.3%	11.8%
West Virginia	12,000 (770.3)	53,880 (3,458.6)	15,576 (999.8)	117.5%	0.1%
Wisconsin	24,000 (480)	107,760 (2,155.3)	13,308 (266.2)	116.6%	11.4%
Wyoming	3,000 (611.3)	13,470 (2,744.9)	760 (154.9)	276.5%	4.1%
United States	1,824,000 (650.9)	7,631,804 (2,723.5)	1,023,959 (365.4)	105.6%	4.9%

Note. MOUD=Medications for Opioid Use Disorder.

Source. Unadjusted OUD prevalence from the National Survey on Drug Use and Health, adjusted OUD prevalence using Keyes et al. 2022 multiplier method, derived from capture-recapture data from the state of Massachusetts, (Barocas et al., 2018) which estimated OUD rates were 4.49 times higher than the NSDUH state-level estimates in 2015. Number of individuals receiving MOUD obtained by combining pharmacy dispensed buprenorphine from IQVIA and number of clients in opioid treatment programs using the National Survey of Substance Abuse Treatment Services.

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^aRates are per 100 000 people aged 12 years.

^bPercent change in rates; State-specific MOUD rates for 2010 and 2018 located in Appendix Table 3.

^cTotal individuals receiving MOUD excludes those receiving naltrexone dispensed in pharmacies.