HHS Public Access

Author manuscript

Drug Alcohol Depend. Author manuscript; available in PMC 2022 October 24.

Published in final edited form as:

Drug Alcohol Depend. 2020 August 01; 213: 108083. doi:10.1016/j.drugalcdep.2020.108083.

Buprenorphine prescription dispensing rates and characteristics following federal changes in prescribing policy, 2017–2018: A cross-sectional study

Douglas R. Roehler[*],

Gery P. Guy Jr.,

Christopher M. Jones

National Center for Injury Prevention and Control, Centers for Disease Control and Prevention, 4770 Buford Highway NE, Atlanta 30341, GA, United States

Abstract

Background: Expansion of buprenorphine for opioid use disorder treatment is a core component of the opioid overdose epidemic response. The Comprehensive Addiction and Recovery Act (CARA) of 2016 authorized nurse practitioners (NPs) and physician assistants (PAs) to obtain a DATA-waiver to prescribe buprenorphine. The objectives of this study are to examine national- and county-level buprenorphine prescription dispensing, patterns by patient demographics and clinician specialty, and county-level characteristics associated with buprenorphine dispensing.

Methods: Retrospective analysis of buprenorphine prescriptions dispensed from approximately 92% of all retail prescriptions in the US (2017–2018). Analyses include rates of buprenorphine prescriptions dispensed, by patient demographics and prescriber specialty, changes in buprenorphine prescriptions dispensed at the national- and county-level, and county-level characteristics associated with buprenorphine dispensing.

Results: Buprenorphine prescriptions dispensed increased by 9.1% nationally, from 40.7–44.4 per 1000 residents. From 2017 to 2018, NPs (351.9%) and PAs (257.3%) had the largest percent increases in dispensed buprenorphine prescriptions, accounting for 79.6% of the total increase. In 2018, county-level characteristics associated with high buprenorphine dispensing included. among others: greater potential buprenorphine treatment capacity, higher drug overdose death rates, and higher rates of Medicaid enrollment. Rural counties were associated with low buprenorphine dispensing.

[*]Corresponding author. droehler@cdc.gov (D.R. Roehler).

Disclaimer

The findings and conclusions in this paper of those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

Declaration of Competing Interest

None.

Appendix A. Supplementary data

Supplementary material related to this article can be found, in the online version, at doi:https://doi.org/10.1016/j.drugalcdep.2020.108083.

Conclusion: Buprenorphine dispensing rates increased in the US from 2017 to 2018, suggesting the addition of NPs and PAs by CARA has contributed to an increase in dispensed buprenorphine prescriptions.

Keywords

Buprenorphine; Opioid use disorder; Policy

1. Introduction

The misuse of prescription opioids and use of illicit opioids contributes to significant morbidity and mortality in the United States. In 2017, 47,600 overdose deaths involved opioids in the United States, nearly double the number of deaths in 2013 (Hedegaard et al., 2018; Scholl et al., 2019). Coinciding with the rise in opioid-involved overdose deaths are increases in other indicators that reflect the magnitude of the opioid crisis. Such indicators include rising opioid-related emergency department visits, injection-related infectious diseases such as viral hepatitis and endocarditis, and rising rates of neonatal abstinence syndrome (Klaman et al., 2017; Ronan and Herzig, 2016; Vivolo-Kantor et al., 2018; Winkelman et al., 2018; Zibbell et al., 2018).

Underlying these opioid-related harms are individuals with opioid use disorder (OUD), a chronic disease that requires treatment for extended periods (Fiellin et al., 2014). Thus, expanding access to medications for opioid use disorder (MOUD) is a central component of the response to the opioid overdose epidemic (Bohnert et al., 2011; Hall et al., 2008; Johnson et al., 2013). MOUD, the combination of medications (methadone, buprenorphine, or naltrexone) with psychosocial services, has proven effective at reducing illicit opioid use and prescription misuse as well as improving health and social outcomes (Kresina et al., 2011; Krupitsky et al., 2011; Lee et al., 2016; Mattick et al., 2009, 2014; Schwartz et al., 2013; Tsui et al., 2014). Despite the evidence supporting the benefits of MOUD, it remains underused in the United States, and access to different MOUD varies widely across and within states (Jones et al., 2015; White House, 2017).

The Drug Addiction Treatment Act of 2000 (DATA, 2000) permitted qualified physicians to obtain a waiver (i.e., DATA-waiver) to prescribe buprenorphine-containing medications for OUD treatment in office-based settings (Drug Addiction Treatment Act of 2000, 2000). This policy change represented a significant step in expanding access to MOUD. One of the intentions of DATA 2000 was to offer medication treatment to a larger and more geographically diverse population than had traditionally been reached by opioid treatment programs (Drug Addiction Treatment Act of 2000, 2000). However, prior research has found large gaps between state need for and state capacity to provide buprenorphine treatment (Jones et al., 2015). A number of factors contribute to this treatment gap. Among clinicians, barriers include limited access to addiction experts and behavioral health services, unwillingness to prescribe, reimbursement concerns, inadequate institutional support such as lack of health system leadership support for providing MOUD, and time constraints (Andrilla et al., 2017; Cunningham et al., 2007; Hutchinson et al., 2014; Walley et al., 2008). Patients also face barriers to treatment. For example, a recent study found that 38–46% of

the heroin-using population in the study were denied appointments from a buprenorphine prescriber, 38% of providers accepting new patients did not allow new uninsured-self-pay patients, and 46% did not accept Medicaid patients (Beetham et al., 2019).

Since the enactment of DATA 2000, additional laws and regulations have expanded the scope of office-based buprenorphine prescribing with the aim of expanding access to treatment. In 2016, the Substance Abuse and Mental Health Services Administration (SAMSHA) promulgated a rule allowing certain qualified physicians to treat up to 275 patients at a time (Center for Substance Use Treatment, 2016). In 2017, through implementation of the Comprehensive Addiction and Recovery Act (CARA) of 2016, eligibility to obtain a DATA-waiver was extended to nurse practitioners and physician assistants (U.S. Congress, 2016; Haffajee et al., 2018). While these policy changes increase the potential for buprenorphine prescribing, the extent to which they have resulted in increased provision of treatment is not known (Ghertner, 2019).

Much of the prior research on buprenorphine prescribing has focused on assessing clinician attitudes and barriers to prescribing buprenorphine, examining the distribution of DATA-waived providers, and tracking aggregate sales data on buprenorphine and policies related to buprenorphine coverage (Andrews et al., 2019; Andrilla et al., 2019a; Knudsen et al., 2017; Stein et al., 2015). Of the limited studies examining buprenorphine prescribing practices, most focused only at the national-level on specific populations (i.e., Medicaid or private insurance), or included only a small subset of states (Saloner et al., 2018; Sharp et al., 2018; Stein et al., 2016; Wen et al., 2019, 2018). To date, no peer-reviewed studies have examined buprenorphine prescription dispensing across all states and counties in the United States, nor examined overall patterns by medical specialty following implementation of the 275-patient limit rule or the CARA provision enabling nurse practitioners and physician assistants to obtain a DATA-waiver.

To address this gap, we analyzed IQVIA retail pharmacy dispensing data to characterize national- and county-level buprenorphine prescriptions in 2017 and 2018 (IQVIA, 2019). In addition, we examined buprenorphine dispensing by medical specialty and county-level characteristics associated with buprenorphine prescription dispensing. These data can help inform the development of more targeted strategies to expand access to MOUD.

2. Materials and methods

We used IQVIA Xponent, National Prescription Audit – New to Brand, and LRx data on buprenorphine prescriptions dispensed in the United States from January 2017 through December 2018. These data contain prescriptions dispensed from approximately 50,400 retail pharmacies in 2881 counties, representing 92% of all retail prescriptions dispensed in the United States. The remaining data are projected to provide national estimates. In IQVIA, a prescription is an initial or refill dispensed pharmaceutical paid for by commercial third party, Medicaid, Medicare Part D, or cash. Only buprenorphine and buprenorphine/naloxone combinations that are FDA-approved for OUD treatment are included in this study. Buprenorphine formulations approved for the treatment of pain (i.e., Butrans, Belbuca, and related generic formulations) were not included. In addition, non-buprenorphine MOUD

(i.e., methadone and naltrexone) were not included. MOUD administered/dispensed through opioid treatment programs, public health, prison systems, Veterans Health Administration, and mail order are not reflected in this study.

We first analyzed buprenorphine prescription dispensing by patient age and sex, and urban/rural categorization (metropolitan, micropolitan, and noncore) and U.S. census region based on the location of the dispensing pharmacy (Ingram and Franco, 2012). State classification can be found here: https://www2.census.gov/geo/pdfs/maps-data/maps/reference/us_regdiv.pdf. The rate of buprenorphine prescriptions dispensed per 1000 persons was examined, along with the absolute and percentage rate change from 2017 to 2018.

Secondly, dispensed buprenorphine prescriptions by specialty was examined in 2017 and 2018. In addition, we calculated the total number of all prescriptions dispensed, buprenorphine prescriptions dispensed, and buprenorphine dispensing rate in 2017 and 2018. The buprenorphine dispensing rate by specialty was defined as number of all prescriptions per 1000 that were buprenorphine. We calculated percent change in number of buprenorphine prescriptions dispensed by specialty from 2017 to 2018.

Third, we examined buprenorphine prescriptions dispensed at the county-level in 2017 and 2018. Data were available from 2881 (91.4%) U.S. counties. We examined changes in buprenorphine dispensing at the county-level from 2017 to 2018 based on percent change. Additional county-level analyses were conducted to determine changes in dispensed buprenorphine prescriptions among nurse practitioners or physician assistants given their new eligibility to prescribe buprenorphine-based treatment under CARA starting in 2017. These analyses used IQVIA LRx data, in which the county location is based on the prescriber, rather than the dispensing pharmacy. To characterize where increases were observed among nurse practitioners and physician assistants, we examined buprenorphine dispensing rates and potential buprenorphine treatment capacity in 2017 among counties experiencing an increase in prescribing by nurse practitioners and physician assistants. We also examined changes in prescribing among nurse practitioners and physician assistants by urban/rural status.

Lastly, to examine buprenorphine dispensing at the county-level in 2018, we created quartiles using county-level dispensing rates per 1000 population. Two separate multivariable logistic regression models were fit to identify county-level factors associated with being a high dispensing county (top quartile) and a low dispensing county (bottom quartile) in 2018. In addition, we fit a multivariable negative binomial regression model to examine county-level factors associated with buprenorphine dispensing as a continuous variable (see Supplemental Table). The presence of overdispersion and results of Akaike information criterion (AIC) indicated that a negative binomial model was the most appropriate model. County-level variables in the model included: potential buprenorphine treatment capacity, drug overdose death rates for 2017, percent male, percent non-Hispanic white, insurance status, percent without a high school diploma, percent unemployed, poverty rates, urban/rural status, and percent disabled. County-level buprenorphine treatment capacity was calculated by determining the maximum number of patients that could be treated by DATA-waived providers, based on each provider's 30, 100, or 275 patient limit,

per 1000 residents. County characteristics were obtained from the American Community Survey (U.S. Census Bureau, 2018), National Center for Health Statistics (Ingram and Franco, 2012); National Ambulatory Medical Survey, 2018), and Substance Abuse and Mental Health Services Administration (Jones et al., 2015). Variable selection was informed by previous literature examining county-level factors associated with opioid dispensing and data availability (Guy et al., 2017). Variance inflation factors were calculated to assess for multicollinearity; none exceeded 3.8 in the final models. Area under the curve (AUC) was used to evaluate the model's discriminatory power. All testing was 2-tailed, with statistical significance set at $P < 0.05$.

All analyses were performed in Stata, version 14.2 (StataCorp). The Centers for Disease Control and Prevention determined this study was conducted with existing data without individual identifiers; thus, the activity is research not involving human subjects, and Institutional Review Board approval was not required.

3. Results

From 2017 to 2018, buprenorphine dispensing increased by 9.1% (1,296,181 prescriptions) nationally, from 40.7 to 44.4 per 1000 residents (Table 1). Patients aged 60−84 years experienced the largest increase by age category (33.0%), and the West had the largest increase by census region (18.2%). In 2018, dispensing rates were highest among males (52.3 per 1000), those age 20−39 years (95.2 per 1000), in micropolitan counties (71.9 per 1000), and in the Northeast (67.2 per 1000).

From 2017 to 2018, nurse practitioners (351.9%) and physician assistants (257.3%) had the largest percent increases in buprenorphine prescriptions (Table 2). In 2018, nurse practitioners and physician assistants accounted for 9.3% of all buprenorphine prescriptions dispensed, compared to only 2.4% in 2017; accounting for 79.6% of the increase in buprenorphine prescriptions dispensed nationally between 2017 and 2018. The next largest increase by specialty was among obstetricians and gynecologists (10.7%). Addiction medicine physicians and psychiatrists experienced decreased rates between 2017 and 2018 (−8.8% and −6.7%, respectively).

From 2017 to 2018, buprenorphine dispensing rates increased in 67.8% of counties (Fig. 1a). Micropolitan counties had the largest percent of counties with an increase in buprenorphine dispensing (75.7%), while noncore counties had the fewest percent of counties with an increase (59.5%). States (including Washington, D.C.) with the largest percent of counties experiencing increases in buprenorphine dispensing were Washington, D.C. (100%), Delaware (100%), Hawaii (100%), Rhode Island (100%), Washington (94.7%), Oregon (94.1%), and New York (91.8%). States with the lowest percentage of counties experiencing increases were New Jersey (38.1%), Florida (40.3%), Louisiana (43.6%), Kansas (44.3%), and South Dakota (47.4%). Substantial variation was observed in buprenorphine dispensing rates at the county-level in 2018, from an average of 2.6 per 1000 residents in the lowest quartile to 168.5 per 1000 in the highest quartile (Fig. 1b).

At the county level, of those with increases in buprenorphine dispensing between 2017 and 2018, 66.3% of these counties experienced increases in part due to prescriptions prescribed by nurse practitioners or physician assistants; and these increases were more likely to occur in counties with higher dispensing rates in 2017. For example, 40% of counties with increases in prescriptions in 2018 among nurse practitioners or physician assistants were in the highest quartile of dispensing in 2017, 28% in the second highest quartile, 20% in the third highest quartile, and 12% in the lowest quartile. Similarly, increases in buprenorphine prescriptions among nurse practitioners and physician assistants were more likely to occur in counties with greater potential buprenorphine treatment capacity in 2017. For example, 44% of counties with increases in nurse practitioner or physician assistant prescriptions in 2018 were already in the highest quartile of potential treatment capacity, 31% were in the second highest quartile, 11% in the third highest quartile, and 15% were in the lowest quartile in 2017. Additionally, the increase in prescriptions among nurse practitioners and physician assistants was 1.3 times greater in rural counties compared to micropolitan and metropolitan counties.

After adjustment in the multivariable logistic regression models, the following characteristics were associated with being a high buprenorphine dispensing county (Table 3): greater potential buprenorphine treatment capacity, adjusted odds ratio (AOR) of 1.15 (95% CI, 1.12–1.18); higher drug overdose deaths rates (AOR = 1.04, 95% CI, 1.04–1.05); lower percentage male (AOR = 0.81, 95% CI, 0.75−0.87); higher percentage non-Hispanic white (AOR = 1.05, 95% CI, 1.04–1.06); higher percentage disabled (AOR = 1.06, 95% CI, 1.01–1.11); higher percentage enrolled in Medicaid (AOR = 1.04, 95% CI, 1.01–1.07); lower percentage enrolled in Medicare (AOR = 0.96, 95% CI, 0.93–1.00); and higher percentage below poverty (AOR = 1.06, 95% CI, 1.02–1.10). Noncore county status was negatively associated with being a high buprenorphine dispensing county compared to metropolitan counties (AOR = 0.36, 95% CI, 0.24−0.48).

County-level characteristics associated with being a low buprenorphine dispensing county were (Table 3): lower potential buprenorphine treatment capacity (AOR = 0.84, 95% CI, 0.80−0.88); lower drug overdose deaths rates (AOR = 0.96, 95% CI, 0.95−0.97); higher percentage male (AOR = 1.09, 95% CI, 1.04–1.14); lower percentage non-Hispanic white (AOR = 0.99, 95% CI, 0.98–1.00); higher Medicare enrollment (AOR = 1.06, 95% CI, 1.03–1.09); lower unemployment rates (AOR = 0.80, 95% CI, 0.72−0.88); and higher percentage without high school diploma (AOR = 1.04, 95% CI, 1.01–1.07). Noncore status was associated with being a low buprenorphine dispensing county compared to metropolitan counties (AOR = 2.70, 95% CI, 2.07–3.52). Results of the multivariable negative binomial regression model examining buprenorphine dispensing as a continuous variable found similar associations between county-level characteristics and buprenorphine dispensing as those found in the multivariable logistic regression models. The AUC for the logistic regression model examining factors associated with high dispensing counties was 0.84, while the AUC for the model examining factors associated with low dispensing counties was 0.81. We examined county-level residuals from the logistic regression models for evidence of autocorrelation using Moran's I statistic. We found that residuals from the models exhibited modest spatial clustering (Moran's $I = 0.05$, $p < 0.001$, and Moran's $I = 0.08$, $p < 0.001$).

4. Discussion

The number of buprenorphine prescriptions dispensed from retail pharmacies in the United States increased by nearly 1.3 million prescriptions between 2017 and 2018, nearly all provider specialty groups contributed to this increase, and the majority of counties experienced an increase in buprenorphine dispensing. In addition, having a higher drug overdose death rate was associated with being a high buprenorphine dispensing county, indicating buprenorphine is being dispensed in areas with greatest need. Greater potential buprenorphine treatment capacity at the county-level was also associated with being a high buprenorphine dispensing county, and the inverse was true for counties with low buprenorphine dispensing. This suggests having more DATA-waivered providers in a community may translate into increases in buprenorphine dispensing, however, prior research has shown that many providers with a DATA-waiver do not prescribe buprenorphine or do not prescribe to their patient limit (Jones and McCance-Katz, 2019). Particularly noteworthy is the finding that nurse practitioners and physician assistants were responsible for 79.6% of the total increase in dispensed buprenorphine prescriptions from 2017 to 2018, indicating the expansion of buprenorphine prescribing eligibility under CARA appears to be having its intended effect.

While these findings are encouraging, significant gaps remain in access to evidence-based treatment for OUD. Researchers have previously found that far more patients are in need of treatment than the number that can access treatment (Jones et al., 2015). Among the more than 2 million American adults aged 18–64 with past-year OUD, only 34.5% reported receiving any substance use treatment in the past year (Jones and McCance-Katz, 2019). Clinicians face multiple challenges when deciding to prescribe buprenorphine. Inadequate medical education on substance use disorders, low self-efficacy for treating patients with OUD, and concerns about buprenorphine diversion are reasons commonly cited by clinicians for not providing medication-based treatment (Cunningham et al., 2006; Jones and McCance-Katz, 2019; Kissin et al., 2006; Netherland et al., 2009). Furthermore, systems-level barriers to not providing MOUD include lack of access to or integration with behavioral health providers and addiction specialists, inadequate institutional support, and low or limited insurance reimbursement (Hutchinson et al., 2014; Jones and McCance-Katz, 2019). Emerging service delivery models such as Vermont's Hub-and Spoke model, the nurse care manager model in Massachusetts, and Rhode Island's Centers of Excellence are designed to address many of these barriers and are producing encouraging results (Rhode Island Department of Behavioral Healthcare, 2016; Brooklyn and Sigmon, 2017; LaBelle et al., 2016; Rawson et al., 2019). Implementing and tailoring these models for other jurisdictions, along with public education campaigns that aim to counter stigma and increase public awareness about evidence-based treatment for OUD, could further amplify the increases in buprenorphine dispensing seen in this study.

Factors other than the need for buprenorphine treatment and the availability of buprenorphine prescribers also correlate with buprenorphine dispensing. In our study, community-factors, including urban/rural status, race/ethnicity composition, and insurance status were associated with buprenorphine dispensing. Consistent with prior research demonstrating limited availability of DATA-waivered providers in rural areas, we found

rural counties were more likely to have low buprenorphine dispensing rates (Andrilla et al., 2019b). Expanding DATA-waiver eligibility under CARA to nurse practitioners and physician assistants has been identified as one potential solution to increase access to MOUD in rural areas (Andrilla et al., 2018). A recent study by Andrilla et al., estimated an additional 15% of people with OUD in rural areas could be treated with buprenorphine as a result of the expansion under CARA (Andrilla et al., 2018). In our analysis, we found the increase in buprenorphine prescriptions among nurse practitioners and physician assistants was 1.3 times greater in rural counties compared to micropolitan and metropolitan counties, demonstrating the important value of nurse practitioners and physician assistants in expanding access to buprenorphine in rural areas. Although this is encouraging, the ability of nurse practitioners and physician assistants to provide MOUD in some states is limited due to state-level policies. For example, as of 2017, nearly half of states prohibited nurse practitioners from prescribing buprenorphine unless they were working with a DATA-waivered physician, and a small minority of states do not allow nurse practitioners or physician assistants to prescribe buprenorphine (Vestal, 2017). Additional efforts to address the unique barriers facing nurse practitioners and physician assistants as well as all DATA-waivered clinicians in rural areas are needed (Andrilla et al., 2017, 2019a).

In addition to urban-rural differences in buprenorphine dispensing, we found counties with a higher percentage of non-Hispanic white population were more likely to be high buprenorphine dispensing counties. This finding may support recent research efforts that found patients with OUD who were black were less likely to receive buprenorphine, raising concerns about the equitable distribution of evidence-based care for OUD (Lagisetty et al., 2019). We also found counties with a higher percentage of Medicaid enrollees were more likely to be high dispensing counties. This finding is consistent with recent research demonstrating significant increases in buprenorphine utilization at the county- and state-level after expansion of Medicaid coverage (Clemans-Cope et al., 2019a,b; Wen et al., 2018). Together, these findings highlight the importance of community context in developing and implementing strategies to respond to the opioid crisis. These findings also underscore the need to better understand and consider issues of health inequity among disadvantaged populations, including racial minorities and Medicaid enrollees, as an avenue to improve access to MOUD.

Finally, although nearly all prescriber specialties experienced increases in buprenorphine dispensing between 2017 and 2018, there was wide variation in these increases across specialties, and addiction medicine specialists and psychiatrists actually experienced modest declines in buprenorphine dispensing in 2018 compared to 2017. Further study to understand the reasons behind the changes and to identify tailored strategies to increase dispensing among different specialties is warranted.

This study is subject to limitations. First, in our analyses, we could not differentiate between prescriptions received for OUD treatment versus those diverted to other uses such as off-label use for pain. Second, when examining prescriber specialty, we are unable to determine the specialty of nurse practitioners or physician assistants. Third, county-level analyses were aggregated by the county in which the buprenorphine prescription was dispensed; therefore, persons who received their prescription and lived in a different county than

the pharmacy were not part of the population denominator for the dispensing county. Fourth, the findings using percent change estimates may overemphasize minor changes in buprenorphine dispensing in counties with low dispensing rates. Fifth, our analysis included 91% of counties in the U.S.; when comparing sociodemographic characteristics between the counties included in our analysis and those not included, we observed a higher percentage of rural counties not included, likely a result of lower IQVIA pharmacy coverage in these areas. However, since our sample includes 91% of counties in the U.S., we believe our findings represent the U.S. experience with respect to buprenorphine dispensing. Sixth, this analysis only included buprenorphine medications with FDA approval for OUD treatment. We did not examine methadone or extended-release naltrexone dispensing. County-level rates and characteristic associated with these medications may be different from that for buprenorphine. Lastly, previous studies have found a moderate degree of spatial dependency with respect to buprenorphine-waivered providers (Ghertner, 2019). When testing county-level residuals we observed a modest degree of spatial autocorrelation that is unlikely to change our results. Future research should further investigate the relationship between county spatial distribution and buprenorphine dispensing practices.

Expanding access to and use of medications to treat OUD remains a critical component of the response to the opioid overdose epidemic (Department of Health and Human Services, 2018). Buprenorphine dispensing has increased significantly in the United States, across a range of physician specialties and among nurse practitioners and physician assistants, and in most U.S. counties. Together, these findings suggest recent legislative and regulatory efforts might have played a role in increasing buprenorphine dispensing. However, significant variation in buprenorphine dispensing across counties continues to exist, with a 66-fold variation between the highest and lowest dispensing counties, suggesting opportunities remain from both clinical and policy perspectives to address these gaps.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgment

Randall Young, MA and Marissa Grossman, PhD, MPH, Division of Toxicology and Human Health Sciences, Agency for Toxic Substances and Disease Registry, CDC

Role of funding source

Nothing declared Contributors: DR refined the research idea, wrote parts of the paper, and reviewed the manuscript. GG analyzed the data, refined the research idea, wrote parts of the paper, and reviewed the manuscript. CJ designed the research idea, wrote parts of the paper, and reviewed the manuscript. All authors have contributed to and approved the final manuscript. Conflict of Interest: The authors have no conflicts to disclose. Acknowledgements: Randall Young, MA; Shannon Graham, MA, Agency for Toxic Substances and Disease Registry, CDC

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

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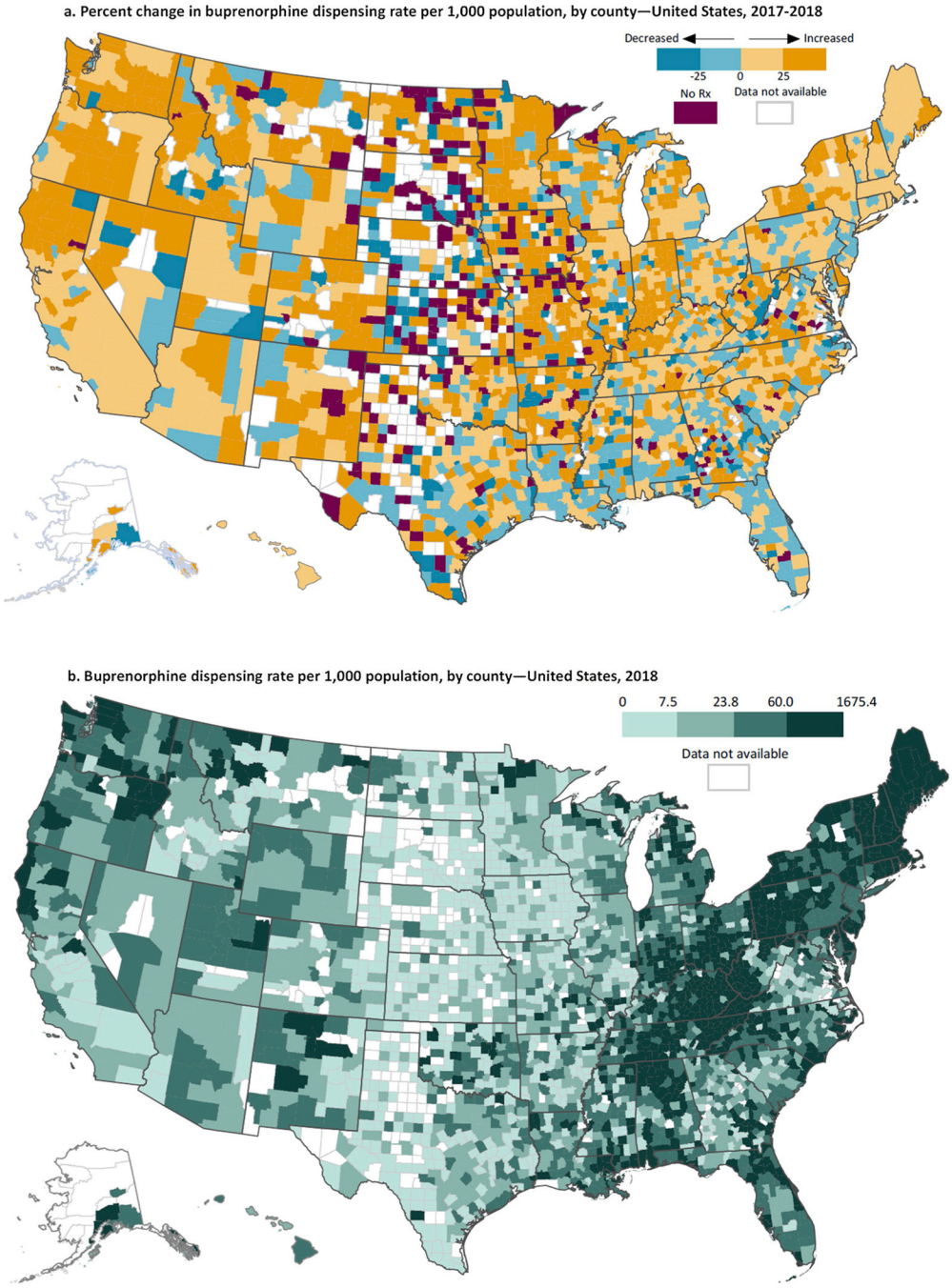

Fig. 1.

a Percent change in buprenorphine dispensing rate per 1000-population, by county-united states, 2017–2018. b Buprenorphine dispensing rate per 1000 population, by county-united states, 2018.

Source: IQVIA Xponent 2017–2018, Data Extracted 2019. The data reflect approximately 92% of prescriptions from retail pharmacies and are projected nationally.

Table 1

Buprenorphine dispensing rate per 1000 population - United States, 2017–2018.

	2017	2018	Absolute change	Percent change
Total	40.7	44.4	3.7	9.1
Patient Sex				
Female	33.4	37.1	3.7	11.1
Male	48.0	52.3	4.3	9.0
Patient Age (yrs)				
10–19	0.8	0.8	0.0	0.0
20–39	91.3	95.2	3.9	4.3
40–59	52.5	61.1	8.6	16.4
60–84	10.6	14.1	3.5	33.0
85+	2.6	3.1	0.5	19.2
Urban/Rural (prescriber) *				
Metropolitan	37.8	41.3	3.5	9.3
Micropolitan	62.7	71.9	9.2	14.7
Noncore	55.6	62.9	7.3	13.1
Region †				
Northeast	62.6	67.2	4.6	7.3
Midwest	34.4	39.2	4.8	14.0
South	48.5	52.5	4.0	8.2
West	19.2	22.7	3.5	18.2

Source: IQVIA Xponent 2017–2018, Data Extracted 2019 (total, urban/rural, region), IQVIA National Prescription Audit New to Brand 2017–2018, Data Extracted 2019. The data reflect approximately 92% of prescriptions from retail pharmacies and are projected nationally.

* 2013 NCHS Urban-Rural Classification Scheme was used for the creation of the county type variables (https://www.cdc.gov/nchs/data_access/urban_rural.htm).

† For list of states in each U.S. census region, see: https://www2.census.gov/geo/pdfs/maps-data/maps/reference/us_regdiv.pdf.

Table 2

Buprenorphine dispensing rates per 1000 population by prescriber specialty, 2017–2018.

Specialty	Buprenorphine Prescriptions		Total Prescriptions		Buprenorphine Dispensing Rate per 1000 prescriptions		Percent change in Number Buprenorphine Prescriptions (2017 to 2018)
	2017	2018	2017	2018	2017	2018	
All	13,241,028	14,537,209	3,809,272,224	3,776,864,137	3.5	3.8	9.8%
Specialty							
Addiction Medicine	291,850	266,297	741,135	674,407	393.8	394.9	−8.8%
Medical Subspecialties*	230,554	250,955	384,876,909	379,367,271	0.6	0.7	8.8%
Primary Care[b]	7,199,741	7,462,933	1,768,822,335	1,704,600,839	4.1	4.4	3.7%
Pain Medicine[a]	625,316	639,499	32,440,743	21,122,441	19.3	20.5	2.3%
Surgery	394,700	400,270	143,715,008	140,261,442	2.7	2.9	1.4%
Obstetrics/Gynecology	351,077	388,499	97,337,643	92,922,541	3.6	4.2	10.7%
Emergency Medicine	472,922	508,059	51,702,209	47,897,670	9.1	10.6	7.4%
Psychiatry	2,535,350	2,366,421	144,742,661	140,549,919	17.5	16.8	−6.7%
Nurse Practitioner	222,266	1,004,500	510,561,996	554,504,470	0.4	1.8	351.9%
Pediatrics	168,705	182,719	135,507,901	131,623,578	1.2	1.4	8.3%
Physical Medicine & Rehab	212,920	225,488	16,116,032	15,066,259	13.2	15	5.9%
Physician Assistant	97,210	347,333	266,763,881	276,922,402	0.4	1.3	257.3%
Other[c]	438,416	494,275	255,967,145	261,379,646	1.7	1.9	12.7%

Source: IQVIA National Prescription Audit New to Brand 2017–2018, Data Extracted 2019. The data reflect approximately 92% of prescriptions from retail pharmacies and are projected nationally.

*Medical Subspecialties include allergy, immunology, cardiology, endocrinology, gastroenterology, hematology, hepatology, infectious disease, oncology, nephrology, pulmonary disease, and rheumatology.

[a]Pain medicine includes pain medicine, anesthesiology.

[b]Primary Care includes internal medicine, family practice, and general practice.

[c]Other includes: neurophysiology, dermatology, dermato-pathology, genetics, hospice and palliative medicine, naturopathic doctor, neurology, nuclear medicine, nutrition, occupational mdicine, optometry, otology, pathology, pharmacist, podiatry, psychology, radiology, sports medicine, clinical pharmacology, medical microbiology, unspecified, and other.

Table 3

County-level characteristics associated with buprenorphine dispensing in 2018.

	High dispensing counties		Low dispensing counties	
	AOR (95% CI)	***p*-value**	**AOR (95% CI)**	***p*-value**
Treatment capacity (waivered buprenorphine providers per 1000)	1.15 (1.12, 1.18)	< 0.001	0.84 (0.80, 0.88)	< 0.001
Drug overdose death rate (2017)	1.04 (1.04, 1.05)	< 0.001	0.96 (0.95, 0.97)	< 0.001
Percent male	0.81 (0.75, 0.87)	< 0.001	1.09 (1.04, 1.14)	< 0.001
Percent non-Hispanic white	1.05 (1.04, 1.06)	< 0.001	0.99 (0.98, 1.00)	0.009
Percent disabled	1.06 (1.01, 1.11)	0.02	0.96 (0.92, 1.00)	0.05
Insurance status (%)				
Uninsured	0.97 (0.93, 1.00)	0.06	1.00 (0.97, 1.02)	0.73
Medicare	0.96 (0.93, 1.00)	0.03	1.06 (1.03, 1.09)	< 0.001
Medicaid	1.04 (1.01, 1.07)	0.009	0.99 (0.96, 1.01)	0.32
Percent unemployed	1.07 (0.96, 1.18)	0.24	0.80 (0.72, 0.88)	< 0.001
Percent without a high school diploma	1.03 (0.99, 1.06)	0.09	1.04 (1.01, 1.07)	0.003
Income below the Federal Poverty Level (%)	1.06 (1.02, 1.10)	0.001	0.98 (0.95, 1.01)	0.14
Urban/Rural [*]				
Metropolitan	Ref		Ref	
Micropolitan	0.88 (0.67, 1.15)	0.34	0.88 (0.65, 1.19)	0.40
Noncore	0.36 (0.27, 0.48)	< 0.001	2.70 (2.07, 3.52)	< 0.001

Data Sources: IQVIA Xponent 2018. Data extracted in 2019 **(Buprenorphine dispensing)**; Substance Abuse and Mental Health Services Administration (treatment capacity); National Vital Statistics System (drug overdose death rates); American Community Survey (percent male, percentage non-Hispanic white, percentage disabled, insurance status, percent unemployed, percentage without a high school diploma, income below the Federal Poverty Level); National Center for Health Statistics (urban/rural status).

Results are from multivariable logistic regression models that include 2881 (91.7%) U.S. counties.

[*]2013 NCHS Urban-Rural Classification Scheme was used for the creation of the county type variables (https://www.cdc.gov/nchs/data_access/urban_rural.htm).

CI=confidence interval.