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Individuals Dispensed Buprenorphine in the United States Before and After Federal Policy Changes Aimed at Increasing Access

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Abstract

Objectives: Buprenorphine can decrease opioid use disorder and mortality risk but remains underutilized. This study evaluates changes in monthly buprenorphine dispensing associated with federal policy changes in the United States from 2018 to 2023.

Methods: This study used interrupted time series analysis comparing the monthly rate of patients dispensed buprenorphine after the implementation of telehealth flexibilities in March 2020, relaxation of training requirements in April 2021, and removal of waiver requirements in December 2022. Buprenorphine formulated for opioid use disorder was included from the IQVIA Total Patient Tracker.

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Results: Before March 2020, the monthly rate of individuals dispensed buprenorphine was increasing. The rate of increase slowed after each policy change: -0.69 (95% CI $= -1.00$ to -0.39) after telehealth flexibilities were initiated, -0.60 (95% CI $= -0.92$ to -0.27) after relaxing training requirements, and -0.49 (95% CI $= -0.73$ to -0.24) after waiver elimination. After the elimination of the waiver, declines were observed across several specialty groups, including pain medicine, emergency medicine, and primary care, while the rate increased among addiction medicine specialists.

Conclusions: After each policy change, the rate of individuals dispensed buprenorphine increased at a slower rate than before each policy change. These findings suggest that the removal of the waiver, while important, may not be sufficient on its own to meaningfully expand buprenorphine prescribing. Individual and systems-level strategies may be needed to fully optimize the impact of these policy changes focusing on reducing patient, clinician, and institutional stigma, addressing clinician barriers, implementing systems-level improvements, and strengthening payment policies that incentivize prescribing.

Keywords

treatment; buprenorphine; policy evaluation

Overdose deaths remain at historically high levels in the United States, with 79,358 overdose deaths involving opioids in 2023.¹ Buprenorphine can decrease opioid use and mortality risk but remains underutilized.^{2,3}

The Drug Addiction Treatment Act of 2000 authorized eligible clinicians to obtain a waiver to the Controlled Substances Act (“waiver”) to prescribe buprenorphine for opioid use disorder (OUD) treatment to a limited number of patients. In March 2020, the Drug Enforcement Administration granted an exemption for in-person evaluations of new patients, allowing telehealth prescribing.⁴ In April 2021, the US Department of Health and Human Services (HHS) issued Buprenorphine Practice Guidelines relaxing buprenorphine waiver training guidelines.⁵ Finally, in December 2022, the waiver requirement to prescribe buprenorphine was removed.⁶

Prior research found that these policy changes resulted in more clinicians with waivers, but limited impact on increasing buprenorphine prescribing.^{7–11} Little is known about how the removal of the waiver has impacted individuals receiving buprenorphine by patient and prescriber characteristics. This study expands on earlier work by examining the association between these 3 policy changes by patient characteristics and prescriber specialty.

METHODS

Data Sources and Study Population

We analyzed data from IQVIA Total Patient Tracker (TPT) to estimate the rate of individuals dispensed buprenorphine from January 2018 to December 2023. IQVIA receives dispensing data from ~56,400 US retail pharmacies, capturing 94% of retail pharmacy prescriptions, and generates national estimates for retail pharmacy dispensed prescriptions. Buprenorphine formulations approved for pain treatment were excluded. The US Centers for Disease

Control and Prevention institutional review board review did not require approval as human subjects research.

Statistical Analysis

We examined the number of individuals dispensed buprenorphine overall, and by patient age, sex, and prescriber specialty. We used interrupted time series analysis to model trends in the monthly rate of individuals dispensed buprenorphine per 100,000 after each policy change: telehealth flexibilities (March 2020), relaxing waiver training guidelines (April 2021 [effective June 2021]), and waiver removal (December 2022 [effective January 2023]). Prais-Winsten regression with the Cochrane-Orcutt transformation and robust standard errors were used to adjust for first-order serial autocorrelation. We examined the Durbin-Watson statistic to ensure that models adequately corrected for first-order autocorrelation. All models controlled for seasonality and days per month. We considered 2-sided $P < 0.05$ statistically significant. Analyses were conducted with Stata, version 17.0 (StataCorp LLC).

RESULTS

The number of individuals dispensed buprenorphine increased from 1.2 million in 2018 to 1.5 million in 2023 (Table 1). Similar patterns were observed by sex. Increases were observed across all age groups except 20–39 years. The number of individuals dispensed buprenorphine decreased among 8 prescriber specialties and increased among 4. The largest increase occurred among advanced practitioners (eg, nurse practitioners and physician assistants) and addiction medicine specialists.

Before March 2020, the monthly rate of individuals dispensed buprenorphine was increasing 1.82 (95% CI: [1.75, 1.90]) (Table 2). In each subsequent post-policy period, the slope decreased: -0.69 ($-1.00, -0.39$) between March 2020 and June 2021, -0.60 ($-0.92, -0.27$) between June 2021 and January 2023, and -0.49 ($-0.73, -0.24$) after January 2023. These declining, yet positive slopes indicate the rate of individuals dispensed buprenorphine *increased* at a slower rate during each subsequent period than before March 2020. After January 2023, the change in rate was no longer statistically significant. Similar findings were observed by sex, except for a level increase (3.90 [$0.86, 6.95$]) among males in March 2020 (eFigure 1, Supplemental Digital Content 1, <http://links.lww.com/JAM/A605>).

Before March 2020, the rate of individuals dispensed buprenorphine was decreasing among those aged ≤ 19 years and increasing among those aged ≥ 20 years (Table 2, eFigure 2, Supplemental Digital Content 1, <http://links.lww.com/JAM/A605>). Between March 2020 and June 2021, the slope increased (0.02 [$0.01, 0.03$]) among individuals aged ≤ 19 years and decreased among individuals aged 20–39 years (-2.04 [$-2.78, -1.31$]) and 40–64 years (-0.71 [$-1.13, -0.28$]). Between June 2021 and January 2023, the slope decreased among individuals aged 20–39 years (-1.00 [$-1.75, -0.25$]) and aged 40–64 years (-1.29 [$-1.77, -0.82$]). After January 2023, the rate was increasing across all age groups except 20–39 years.

Before March 2020, the monthly rate of individuals dispensed buprenorphine was increasing across 5 prescriber specialties, decreasing among 3, and stable among 4. In March 2020,

a level increase was observed among advanced practitioners (2.47 [0.31, 4.63]), while a level decrease was observed among 6 specialty groups (Table 2, eFigure 3 Supplemental Digital Content 1, <http://links.lww.com/JAM/A605>). Between March 2020 and June 2021, the slope decreased among addiction medicine (−0.11 [−0.18, −0.03]), obstetrics/gynecology (−0.04 [−0.06, −0.02]), pain medicine (−0.05 [−0.08, −0.02]), primary care (−0.58 [−0.80, −0.36]), surgery (−0.03 [−0.05, 0.02]), and medical subspecialties (−0.08 [−0.10, −0.06]). In June 2021, a level increase was observed among 4 specialty groups. Between June 2021 and January 2023, the slope decreased among 2 specialty groups and increased among 3 specialty groups. In January 2023, a level increase was observed among musculoskeletal (0.14 [0.04, 0.23]) and surgery (0.16 [0.03, 0.28]) specialists, while a level decrease was observed among emergency medicine (−0.35 [−0.58, −0.13]), obstetrics/gynecology (−0.23 [−0.42, −0.05]), and primary care (−1.93 [−3.62, −0.23]). After January 2023, the slope decreased among emergency medicine (−0.04 [−0.06, −0.01]), pain medicine (−0.06 [−0.09, −0.04]), and other/unknown specialties (−0.08 [−0.12, −0.03]), and increased among addiction medicine specialists (0.10 [0.01, 0.19]). After January 2023, the rate of individuals dispensed buprenorphine was only increasing among addiction medicine specialists and advanced practitioners.

DISCUSSION

Consistent with previous studies, we found no acceleration in the rate of individuals dispensed buprenorphine following COVID-19 telehealth flexibilities, release of the Practice Guidelines, or elimination of the waiver.^{7–11} In fact, after each policy change, the rate of individuals dispensed buprenorphine increased at a slower rate than before each policy change. Although previous research found that these policies may have increased the number of clinicians prescribing buprenorphine,^{7–9} similar to our findings increases in patients receiving buprenorphine were either not observed or not sustained over time.^{10–12} This could be due, in part, to lower prescribing rates observed among newly prescribing clinicians.^{7,8} Overall, these findings suggest that removal of the waiver, while important, may on its own not be sufficient to meaningfully expand prescribing.

We extend the findings of earlier work by examining changes by prescriber specialty. Despite the overall lack of acceleration in buprenorphine dispensing after the elimination of the waiver, there was a significant increase among addiction medicine specialists, while declines were observed across several specialty groups, including pain medicine, emergency medicine, and primary care. Further understanding facilitators and barriers for prescribing among these clinician groups could inform future practice, program, and policy changes to enable broader adoption of prescribing.

Limitations include a lack of data on prescriptions dispensed by mail-order or long-term care facilities and prescriptions written but not dispensed, the inability to differentiate between prescriptions for OUD versus off-label use for pain, and only examining changes in the first year of waiver elimination.

CONCLUSIONS

This study highlights the ongoing challenges with expanding buprenorphine treatment, despite waiver removal, an often-invoked barrier to prescribing.¹³ Prior research has identified multiple individual, system, and societal barriers to prescribing buprenorphine, including stigma toward people with OUD and against MOUD itself; lack of clinician training; administrative burdens (eg, prior authorizations); cost and insufficient reimbursement; and inadequate behavioral health supports.^{12–15} A holistic approach may be needed to fully optimize the impact of these recent policy changes focusing on reducing these barriers.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention or the Substance Abuse and Mental Health Services Administration.

REFERENCES

1. Garnett MF, Miniño AM. Drug Overdose Deaths in the United States, 2003–2023 NCHS Data Brief, No 522. National Center for Health Statistics; 2024.
2. Barham C, Strahan A, Zhang K, et al. National- and state-level pharmacy-based buprenorphine dispensing, United States 2019–2021. *J Gen Intern Med*. 2024;39:1951–1953. [PubMed: 38806799]
3. Santo T Jr, Clark B, Hickman M, et al. Association of opioid agonist treatment with all-cause mortality and specific causes of death among people with opioid dependence: a systematic review and meta-analysis. *JAMA Psychiatry*. 2021;78:979–993. [PubMed: 34076676]
4. Health and Human Services Department. Office of Civil Rights: Notification of Enforcement Discretion for Telehealth Remote Communications during the COVID-19 Nationwide Public Health Emergency. 2021. Accessed March 25, 2024. <https://www.hhs.gov/hipaa/for-professionals/special-topics/emergency-preparedness/notification-enforcement-discretion-telehealth/index.html>
5. Health and Human Services Department. Practice Guidelines for the Administration of Buprenorphine for Treating Opioid Use Disorder. Federal Register; 2021. Accessed March 25, 2024. <https://www.federalregister.gov/documents/2021/04/28/2021-08961/practice-guidelines-for-the-administration-of-buprenorphine-for-treating-opioid-use-disorder>
6. Wavier Elimination (MAT Act). Accessed March 25, 2024. Substance Abuse and Mental Health Services Administration. 2024. <https://www.samhsa.gov/medications-substance-use-disorders/waiver-elimination-mat-act>
7. Jones CM, Olsen Y, Ali MM, et al. Characteristics and prescribing patterns of clinicians waived to prescribe buprenorphine for opioid use disorder before and after release of new practice guidelines. *JAMA Health Forum*. 2023;4:e231982. [PubMed: 37477926]
8. Luo Q, Erikson CE. Changes in waived clinicians prescribing buprenorphine and prescription volume by patient limit. *JAMA*. 2023;329:1792–1794. [PubMed: 37103912]
9. Chua K, Bicket M, Bohnert A, et al. Buprenorphine dispensing after elimination of the waiver requirement. *N Engl J Med*. 2024;390:1530–1532. [PubMed: 38657250]
10. Savitz ST, Stevens MA, Nath B, et al. Trends in the prescribing for opioid use disorder, 2019–2023. *Mayo Clin Proc Inn Qual Out*. 2024;8:308–320.

11. Ali MM, Credon TB, Jacobus-Kantor L, et al. National trends in buprenorphine prescribing before and during the COVID-19 pandemic. *J Subst Abuse Treat.* 2023;144:108923. [PubMed: 36334383]
12. Cioe K, Biondi BE, Easley R, et al. A systematic review of patients' and providers' perspectives of medications for treatment of opioid use disorder. *J Subst Abuse Treat.* 2020;119:108146. [PubMed: 33138929]
13. Haffajee RL, Bohnert ASB, Lagisetty PA. Policy pathways to address provider workforce barriers to buprenorphine treatment. *Am J Prev Med.* 2018;54(6 suppl 3):S230–S242. [PubMed: 29779547]
14. Lister JJ, Weaver A, Ellis JD, et al. A systematic review of rural-specific barriers to medication treatment for opioid use disorder in the United States. *Am J Drug Alcohol Abuse.* 2020;46:273–288. [PubMed: 31809217]
15. Strahan A, Desai S, Zhang K, et al. Trends in out-of-pocket costs for and characteristics of pharmacy-dispensed buprenorphine medications for opioid use disorder treatment by type of payer, 2015 to 2020. *JAMA Netw Open.* 2023;6:e2254590. [PubMed: 36763363]

TABLE 1.
Number of Individuals Dispensed Buprenorphine From US Retail Pharmacies, 2018–2023

	2018	2019	2020	2021	2022	2023	% change
Overall	1,217,804	1,310,879	1,395,871	1,450,918	1,477,516	1,502,268	23.36
Sex							
Male	688,599	737,802	786,727	818,554	835,728	849,103	23.31
Female	532,161	573,684	610,331	630,671	641,973	653,663	22.83
Age (y)							
≤19	3448	3181	3481	4218	4703	5405	56.77
20–39	700,381	716,592	725,727	717,138	706,384	652,993	–6.77
40–64	480,106	542,133	605,399	655,964	720,618	743,795	54.92
≥65	39,112	51,190	63,619	74,545	87,925	100,435	156.79
Prescriber specialty							
Addiction medicine	32,120	45,646	41,960	41,000	44,724	57,174	78.00
Advanced practitioner [*]	246,119	450,683	619,464	765,050	898,247	993,553	303.69
Emergency medicine	63,469	62,664	61,209	67,236	78,418	80,849	27.38
Hospitalist and palliative care [†]	2539	1828	2419	2107	3225	3174	25.02
Musculoskeletal [‡]	39,066	34,131	32,408	27,387	25,764	25,108	–35.73
OB/GYN	46,118	48,030	41,561	40,158	38,753	32,776	–28.93
Other/unknown [§]	40,731	32,270	32,164	32,056	38,293	37,722	–7.39
Pain medicine	90,787	92,348	84,546	81,680	83,950	77,939	–14.15
Primary care [¶]	878,405	897,551	857,341	827,081	825,027	777,679	–11.47
Psychiatrist	263,601	242,660	219,410	197,016	178,515	153,395	–41.81
Medical subspecialty [#]	68,582	66,304	58,596	51,861	49,240	49,065	–28.46
Surgery ^{**}	39,895	37,049	34,267	29,017	26,219	25,940	–34.98

For data stratified by sex, age, and prescriber specialty, counts do not sum to the overall total because the total is calculated by deduplicating individuals who have multiple prescriptions during the time period which may fall into separate subcategories.

^{*} Advanced practitioner includes nurse practitioner, physician assistant, and naturopathic doctor.

[†] Hospitalist and palliative care includes critical care medicine, pulmonary critical care, pediatric critical care, critical care (neurosurgery), ob/gyn critical care, and hospice and palliative medicine.

[‡] Musculoskeletal includes rheumatology, physical medicine and rehab, sports medicine, orthopedic surgery, and orthopedic surgery of the spine.

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§ Other specialty includes other specialty and specialty unspecified.

// Pain medicine includes pain medicine and anesthesiology.

¶ Primary care includes internal medicine, internal medicine/pediatrics, pediatrics, family practice, general preventive medicine, geriatrics, and osteopathic medicine.

Medical subspecialty includes allergy/immunology (diagnostic laboratory), clinical neurophysiology, genetics, nutrition, occupational medicine, cardiology, endocrinology, gastroenterology, hematology, hepatology, nephrology, pulmonary disease, allergy, dermatology, dermatopathology, infectious disease, neurology, nuclear medicine, podiatry, radiology, sleep medicine, ophthalmology, otolaryngology, dentistry, pathology, oncology, medical microbiology, and pharmacist.

** Surgery includes urology, surgical critical care medicine, colon and rectal surgery, cardiothoracic surgery, cardiovascular surgery, general surgery, neurological surgery, pediatric neurosurgery, oral and maxillofacial surgery, plastic surgery, other surgery, and thoracic surgery

Source: IQVIA Total Patient Tracker (TPT) 2018–2023.

TABLE 2.
Interrupted Time Series Analysis Estimates for Monthly Rate of Individuals Dispensed Buprenorphine, January 2018 to December 2023

	COVID-19 flexibilities (March 2020)				Practice guideline (June 2021)			Waiver elimination (January 2023)		
	Monthly trend (slope) before March 2020	Change in level	Change in slope	Slope after COVID-19 flexibilities	Change in level	Change in slope	Slope after practice guideline	Change in level	Change in slope	Slope after waiver elimination
Overall	1.82* (1.75–1.90)	1.06 (–1.53 to 3.65)	–0.69* (–1.00 to –0.39)	1.13* (0.83–1.43)	–0.11 (–3.16 to 2.93)	–0.60* (–0.92 to –0.27)	0.53* (0.41–0.66)	–2.03 (–4.52 to 0.45)	–0.49* (–0.73 to –0.24)	0.05 (–0.18 to 0.27)
Sex										
Male	1.96* (1.87–2.06)	3.90* (0.86–6.95)	–0.69* (–1.03 to –0.35)	1.27* (0.94–1.61)	–0.31 (–3.62 to 3.01)	–0.88* (–1.23 to –0.54)	0.40* (0.26–0.52)	–2.04 (–4.86 to 0.78)	–0.35* (–0.64 to –0.07)	0.04 (–0.23 to 0.31)
Female	1.76* (1.71–1.83)	1.27 (–1.03 to 3.56)	–0.77* (–1.05 to –0.49)	1.00* (0.71–1.28)	0.02 (–2.89 to 2.94)	–0.47* (–0.77 to –0.17)	0.53* (0.40–0.65)	–1.99 (–4.27 to 0.28)	–0.42* (–0.64 to –0.19)	–0.11 (–0.10 to 0.31)
Age (y)										
≤19	–0.01* (–0.01 to –0.002)	0.07 (–0.02 to 0.16)	0.02* (0.01–0.03)	0.01* (0.002–0.02)	0.03 (–0.08 to 0.13)	0.001 (–0.01 to 0.01)	0.01* (0.005–0.02)	0.03 (–0.10 to 0.17)	0.01 (–0.01 to 0.02)	0.02* (0.003–0.03)
20–39	1.77* (1.57–1.97)	6.68 (–0.04 to 13.40)	–2.04* (–2.78 to –1.31)	–0.27 (–0.97 to 0.43)	1.96 (–4.85 to 8.78)	–1.00* (–1.75 to –0.25)	–1.27* (–1.55 to –0.99)	–18.53* (–25.13 to –11.93)	–0.50 (–1.14 to 0.13)	–1.77* (–2.38 to –1.17)
40–64	3.99* (3.86–4.12)	3.24 (–0.44 to 6.93)	–0.71* (–1.13 to –0.28)	3.29* (2.88–3.70)	1.45 (–3.50 to 6.39)	–1.29* (–1.77 to –0.82)	1.99* (1.75–2.24)	–3.28 (–0.76 to 7.32)	–0.21 (–0.64 to 0.22)	1.78* (1.44–2.13)
≥65	1.15* (1.11–1.20)	–0.9 (–2.34 to 0.54)	–0.09 (–0.25 to 0.08)	1.07* (0.91–1.23)	0.23 (–1.72 to 2.19)	–0.04 (–0.23 to 0.15)	1.03* (0.92–1.13)	0.37 (–1.36 to 2.09)	–0.18 (–0.37 to 0.01)	0.84* (0.68–1.00)
Prescriber specialty										
Addiction medicine	0.07* (0.04–0.10)	–0.29* (–0.56 to –0.03)	–0.11* (–0.18 to –0.03)	–0.04 (–0.09 to 0.01)	0.29* (0.04–0.54)	0.06 (–0.02 to 0.14)	0.03 (–0.01 to 0.07)	0.07 (–0.45 to 0.59)	0.10* (0.01–0.19)	0.13* (0.05–0.20)
Advanced practitioner [†]	1.88* (1.79–1.97)	2.47* (0.31–4.63)	–0.11 (–0.31 to 0.09)	1.77* (1.60–1.94)	2.71* (0.87–4.54)	–0.51* (–0.72 to –0.30)	1.26* (1.15–1.38)	–0.76 (–3.19 to 1.67)	–0.24 (–0.50 to 0.02)	1.02* (0.80–1.25)
Emergency medicine	0.005 (–0.01 to 0.01)	–0.56* (–0.91 to –0.22)	0.03 (–0.005 to 0.06)	0.03* (0.001–0.07)	–0.08 (–0.32 to 0.16)	–0.01 (–0.05 to 0.03)	0.02* (0.01–0.04)	–0.35* (–0.58 to –0.13)	–0.04* (–0.06 to –0.01)	–0.01 (–0.03 to 0.01)

	COVID-19 flexibilities (March 2020)				Practice guideline (June 2021)			Waiver elimination (January 2023)		
	Monthly trend (slope) before March 2020	Change in level	Change in slope	Slope after COVID-19 flexibilities	Estimate (95% CI)	Estimate (95% CI)	Change in level	Estimate (95% CI)	Change in slope	Slope after waiver elimination
	Estimate (95% CI)	Estimate (95% CI)	Estimate (95% CI)	Estimate (95% CI)	Estimate (95% CI)	Estimate (95% CI)	Estimate (95% CI)	Estimate (95% CI)	Estimate (95% CI)	Estimate (95% CI)
Hospitalist and palliative Care [‡]	-0.0003 (-0.002 to 0.001)	-0.005 (-0.04 to 0.03)	0.0004 (-0.003 to 0.004)	0.0001 (-0.003 to 0.003)	0.01 (-0.02 to 0.03)	0.003 (-0.001 to 0.01)	-0.03 (-0.06 to 0.012)	-0.001 (-0.01 to 0.01)		
Musculoskeletal [§]	-0.02* (-0.03 to -0.01)	0.05 (-0.06 to 0.17)	-0.02 (-0.04 to -0.001)	-0.04* (-0.05 to -0.02)	0.12 (-0.08 to 0.31)	0.01 (-0.01 to 0.03)	0.14* (0.04 to 0.23)	-0.01 (-0.03 to 0.01)		-0.04* (-0.05 to -0.02)
OB/GYN	0.02* (0.005 to 0.03)	-0.22 (-0.37 to -0.07)	-0.04* (-0.06 to -0.02)	-0.03* (-0.04 to -0.02)	0.25* (0.15 to 0.35)	-0.01 (-0.03 to 0.01)	-0.23* (-0.42 to -0.05)	0.02 (-0.01 to 0.04)		-0.02 (-0.04 to 0.001)
Other/unknown	-0.01 (-0.04 to 0.01)	0.13 (-0.19 to 0.46)	-0.004 (-0.05 to 0.04)	-0.02 (-0.05 to 0.02)	0.09 (-0.12 to 0.29)	0.05* (0.002 to 0.09)	0.24 (-0.04 to 0.52)	-0.08* (-0.12 to -0.03)		-0.05* (-0.09 to -0.004)
Pain medicine [¶]	0.02* (0.01 to 0.03)	-0.46* (-0.73 to -0.20)	-0.05* (-0.08 to -0.02)	-0.03* (-0.06 to -0.004)	-0.02 (-0.29 to 0.26)	-0.003 (-0.03 to 0.03)	-0.20 (-0.46 to 0.06)	-0.06* (-0.09 to -0.04)		-0.10* (-0.12 to -0.07)
Primary care [#]	0.28* (0.18 to 0.37)	-2.47* (-4.43 to -0.50)	-0.58* (-0.80 to -0.36)	-0.30* (0.50 to -0.11)	0.39 (-1.74 to 2.53)	-0.14 (-0.36 to 0.08)	-1.93* (-3.62 to -0.23)	-0.10 (-0.25 to 0.06)		-0.54* (-0.68 to -0.41)
Psychiatrist	-0.16* (-0.19 to -0.14)	-0.44 (-1.03 to 0.14)	-0.02 (-0.09 to 0.04)	-0.18* (-0.24 to -0.12)	-0.31 (-0.87 to 0.25)	-0.11* (-0.17 to -0.05)	-0.16 (-0.54 to 0.23)	0.03 (-0.004 to 0.07)		-0.26* (-0.30 to -0.23)
Medical subspecialty ^{**}	0.002 (-0.01 to 0.01)	-0.18* (-0.31 to -0.04)	-0.08* (-0.10 to -0.06)	-0.08* (-0.09 to -0.06)	0.09 (-0.07 to 0.24)	0.04* (0.02 to 0.06)	0.19 (-0.03 to 0.42)	0.02 (-0.02 to 0.07)		-0.01 (-0.05 to 0.03)
Surgery ^{††}	-0.01* (-0.02 to -0.01)	0.03 (-0.11 to 0.17)	-0.03* (-0.05 to -0.02)	-0.04* (-0.06 to -0.03)	0.12* (0.01 to 0.23)	0.01* (0.002 to 0.03)	0.16* (0.03 to 0.28)	0.004 (-0.01 to 0.02)		-0.03* (-0.04 to -0.01)

Monthly rate of individuals per 100,000 with at least 1 buprenorphine prescription filled. All models control for days per month and seasonality (quarterly covariates).

* Indicates statistical significance ($P < 0.05$).

[‡] Advanced Practitioner includes nurse practitioner, physician assistant, and naturopathic doctor.

[§] Hospitalist and palliative care includes critical care medicine, pulmonary critical care, pediatric critical care, critical care (neurosurgery), ob/gyn critical care, and hospice and palliative medicine.

[¶] Musculoskeletal includes rheumatology, physical medicine and rehab, sports medicine, orthopedic surgery, and orthopedic surgery of the spine.

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// Other specialty includes other specialty and specialty unspecified.

Pain medicine includes pain medicine and anesthesiology.

Primary care includes geriatrics, internal medicine, internal medicine/pediatrics, pediatrics, family practice, general practice, general preventive medicine, and osteopathic medicine.

** Medical subspecialty includes allergy/immunology (diagnostic laboratory), clinical neurophysiology, genetics, nutrition, occupational medicine, cardiology, endocrinology, gastroenterology, hematology, hepatology, nephrology, pulmonary disease, allergy, dermatology, dermatopathology, infectious disease, neurology, nuclear medicine, podiatry, radiology, sleep medicine, ophthalmology, otolaryngology, dentistry, pathology, oncology, medical microbiology, and pharmacist.

†† Surgery includes urology, surgical critical care medicine, colon and rectal surgery, cardiothoracic surgery, cardiovascular surgery, general surgery, neurological surgery, pediatric neurosurgery, oral and maxillofacial surgery, plastic surgery, other surgery, and thoracic surgery.

Source: IQVIA Total Patient Tracker (TPT) 2018-2023