Letters

Assessment of Filled Buprenorphine Prescriptions for Opioid Use Disorder During the Coronavirus Disease 2019 Pandemic

The coronavirus disease 2019 (COVID-19) pandemic has profoundly disrupted health care delivery in the US.[1] The Centers for Disease Control and Prevention noted a 9.1% increase in reported 12-month counts of drug overdose deaths from March 2019 to March 2020, from 67 726 to 73 860.[2] On March 13, 2020, a COVID-19 national emergency was declared. To diminish potential barriers to treatment access, 3 days later, federal guidelines on telemedicine use were released, providing authorized practitioners increased flexibility to prescribe buprenorphine to patients with opioid use disorder (OUD) during this public health emergency.[3] Other local, state, and federal policy initiatives have also attempted to preserve access to medication treatment for OUD, yet the cumulative outcome of these undertakings is not clear.

Methods | Using retail pharmacy claims from Symphony Health, US database that includes 92% of retail pharmacy claims,[4] we examined secular trends of total US retail pharmacy sales and sales of buprenorphine products with a US Food and Drug Administration–approved indication for treatment of OUD.[5] We counted the number of individuals who filled prescriptions in each week between May 1, 2019, and June 28, 2020, except for the week of March 8 to March 15, 2020, which was excluded because this was the week before the transitioning week (March 16). The results were not sensitive to analysis including this week.

We plotted the raw and fitted number of individuals filling prescriptions during the prepandemic and pandemic periods. We defined the transition between these periods as occurring on March 16, 2020, when the Substance Abuse and Mental Health Services Administration and Drug Enforcement Administration approved telemedicine use for buprenorphine prescribing. We further stratified national changes by payer, including Medicaid, Medicare Part D, commercial plans, and prescriptions paid in cash. Using quasi-experimental interrupted time series analysis, we examined whether there was a change in the level or rate of growth (slope) of filled prescriptions between the 2 periods. Data analysis was conducted with Stata, version 16.1 (StataCorp LLC), using 2-sided t tests for regressions, with significance set at $P < .05$. The study was exempted from review by Indiana University's Institutional Review Board. Data were deidentified. This study followed the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) reporting guideline.

Results | The weekly number of individuals filling prescriptions of buprenorphine indicated for OUD increased steadily from 172 165 in May 2019 to 216 939 in March 2020—a 26.01% increase. The weekly number of individuals filling prescriptions of any type also increased steadily during this period, albeit at a lower rate of 8.78% (**Figure**, A).

The weekly growth rate in the level of prescription fills for buprenorphine significantly declined by 0.50% (95% CI, −0.84% to −0.15%) between the prepandemic and pandemic periods (**Table**). We found no statistically significant or sudden declines in the level of these prescriptions in March (intercepts). In contrast to buprenorphine prescriptions, the pandemic period was associated with an abrupt and statistically significant decline in both the level (−5.03 million, 95% CI, −6.85 million to −3.20 million) and growth rate (−0.57%, 95% CI, −1.01% to −0.14%) when considering all filled prescriptions collectively.

Filled prescriptions for buprenorphine paid in cash significantly declined in both the levels and growth rate in the pandemic period; no significant changes were found in filled prescriptions paid by Medicaid (Figure, B and Table). In general, the changes in prescriptions paid by Medicare and commercial plans followed the patterns described above for all buprenorphine prescriptions.

Discussion | Our findings suggest that, since the COVID-19 national emergency declaration, the number of individuals filling buprenorphine prescriptions has plateaued but has not decreased; however, filled prescriptions for all medications collectively have decreased considerably. Study limitations include our inability to identify off-label prescribing, illicit diversion, or dispensing of buprenorphine via opioid treatment programs. In addition, we cannot precisely identify treatment initiation vs continuation. Efforts to engage patients with OUD via telehealth may have helped retain patients who otherwise would have discontinued treatment. It is also plausible that continued telehealth service provision plays an important role in addressing the ongoing opioid crisis. Given buprenorphine's role in treating OUD, our findings may contribute to a better understanding of the pandemic's association with the treatment of OUD.

Thuy D. Nguyen, PhD
Sumedha Gupta, PhD
Engy Ziedan, PhD
Kosali I. Simon, PhD
G. Caleb Alexander, MD, MS
Brendan Saloner, PhD
Bradley D. Stein, MD, PhD

Author Affiliations: Department of Health Management and Policy, School of Public Health, University of Michigan, Ann Arbor (Nguyen); Department of Economics, Indiana University-Purdue University Indianapolis (Gupta); Department of Economics, Tulane University, New Orleans, Louisiana (Ziedan); O'Neill School Public and Environmental Affairs, Indiana University Bloomington (Simon); Department of Epidemiology, Johns Hopkins Bloomberg School of

Figure. Weekly Averages of Individuals With Filled Prescriptions Before and During the Coronavirus Disease 2019 Pandemic

A Buprenorphine vs any prescription

B Individuals filling buprenorphine prescription by payer
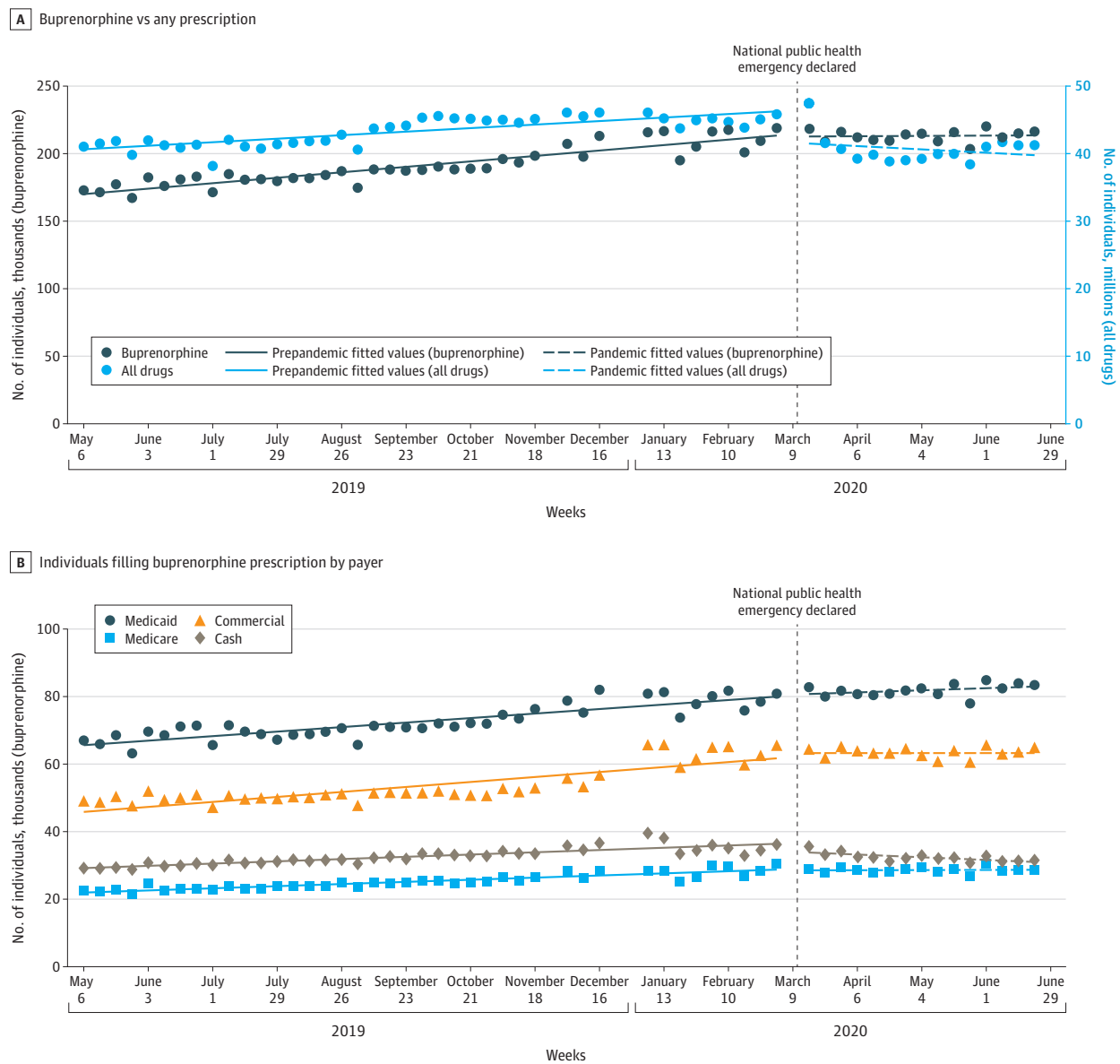
Data from Symphony Health, a US database that includes 92% of retail pharmacy claims, 71% of mail order pharmacy claims, and 65% of specialty pharmacy activity. We counted the number of individuals who filled prescriptions in each week between May 6, 2019, and June 28, 2020, except for the week of March 8 to March 15, 2020, which was excluded because this was the week before the transitioning week (March 16). We also excluded several weeks with national holidays: November 26, 2019, December 24, 2019, and January 1, 2020, to smooth the data. Buprenorphine prescriptions of 1 048 575 unique individuals were identified by the national drug codes of buprenorphine products from the Centers for Disease Control and Prevention; 2 buprenorphine products (Butrans and Belbuca) were excluded from the sample because they are indicated for pain management.

Public Health, Baltimore, Maryland (Alexander); Department of Health Policy and Management, Johns Hopkins Bloomberg School of Public Health, Baltimore, Maryland (Saloner); RAND Corporation, Pittsburgh, Pennsylvania (Stein).

Accepted for Publication: October 24, 2020.

Published Online: December 21, 2020. doi:10.1001/jamainternmed.2020.7497

Corresponding Author: Thuy D. Nguyen, PhD, Department of Health Management and Policy, School of Public Health, University of Michigan, 1415 Washington Heights, M3234 SPH II, Ann Arbor, MI 48109 (thuydn@umich.edu).

Table. Changes in Prescription Fills Before and During the COVID-19 Pandemic[a]

| | Mean (95% CI) | | | | | |
| | Buprenorphine vs any prescription | | Buprenorphine prescriptions by payer (thousands of individuals) | | | |
Variable	Buprenorphine (thousands)	Any prescription (millions)	Medicaid	Medicare	Commercial	Cash
Predicted No. of individuals (intercepts)[b]						
Prepandemic (3/2/2020 to 3/8/2020)	215.41 (211.64 to 219.19)	46.52 (45.49 to 47.54)	80.65 (79.09 to 82.21)	29.06 (28.42 to 29.70)	62.44 (60.59 to 64.29)	36.72 (35.93 to 37.52)
Pandemic (3/16/2020 to 3/22/2020)	212.71 (207.17 to 218.26)	41.49 (39.98 to 43.00)	80.75 (78.46 to 83.04)	28.53 (27.60 to 29.47)	63.25 (60.54 to 65.97)	33.81 (32.64 to 34.99)
Before-after change in level[c]	−2.7 (−9.41 to 4.00)	−5.03 (−6.85 to −3.20)	0.1 (−2.67 to 2.88)	−0.53 (−1.66 to 0.60)	0.81 (−2.47 to 4.10)	−2.91 (−4.33 to −1.49)
Weekly growth rate, %[d]						
Prepandemic	0.52 (0.45 to 0.59)	0.3 (0.22 to 0.39)	0.46 (0.38 to 0.53)	0.62 (0.53 to 0.70)	0.66 (0.55 to 0.78)	0.51 (0.43 to 0.59)
Pandemic	0.03 (−0.31 to 0.36)	−0.27 (−0.70 to 0.16)	0.19 (−0.18 to 0.56)	0.04 (−0.38 to 0.46)	0.001 (−0.56 to 0.56)	−0.61 (−1.02 to −0.20)
Before-after change in growth rate[e]	−0.50 (−0.84 to −0.15)	−0.57 (−1.01 to −0.14)	−0.27 (−0.65 to 0.11)	−0.58 (−1.01 to −0.15)	−0.66 (−1.24 to −0.09)	−1.12 (−1.54 to −0.70)

[a] National pharmacy claims data between May 2019 and June 2020 from Symphony Health. We excluded several weeks with national holidays (November 26, 2019, December 24, 2019, and January 1, 2020), and week of March 8, 2020 to smooth the data.

[b] The predicted means (intercepts) are calculated from ordinary least squares regressions of the weekly number of individuals filling prescriptions on weekly trends.

[c] The differences in the intercepts and their 95% CI are used to test the before-after change.

[d] The predicted growth rates are calculated as the slopes from log-linear regressions of logged number of individuals on weekly trends.

[e] The differences in the predicted slopes and their 95% CI are used to test the before-after change.

1. Cutler D. How will COVID-19 affect the health care economy? *JAMA*. 2020; 323(22):2237-2238. doi:10.1001/jama.2020.7308

2. Ahmad FB, Rossen LM SP. Provisional drug overdose death counts. National Center for Health Statistics. Reviewed September 16, 2020. Accessed October 10, 2020. https://www.cdc.gov/nchs/nvss/vsrr/drug-overdose-data.htm

3. American Society of Addiction Medicine. Access to buprenorphine in office-based settings: ASAM COVID-19 Task Force Recommendations. Published 2020. Accessed October 10, 2020. https://www.asam.org/Quality-Science/covid-19-coronavirus/access-to-buprenorphine

4. Stein BD, Sorbero M, Dick AW, Pacula RL, Burns RM, Gordon AJ. Physician capacity to treat opioid use disorder with buprenorphine-assisted treatment. *JAMA*. 2016;316(11):1211-1212. doi:10.1001/jama.2016.10542

5. Centers for Disease Control and Prevention. Data resources: analyzing opioid prescription data and oral morphine milligram equivalents (MME), 2018 version. Reviewed October 9, 2020. Accessed January 8, 2020. https://www.cdc.gov/drugoverdose/resources/data.html