Introduction: Both opioid use disorder and mortality for opioid overdoses are increasing. Family physicians (FPs) can treat opioid use disorder if they are waivered to prescribe buprenorphine. Our objective was to determine personal, practice, and community characteristics associated with FPs prescribing buprenorphine.

Methods: We used data from the 2017 and 2018 American Board of Family Medicine examination registration questionnaire. The questionnaire asked about current prescribing of buprenorphine, as well as about practice size, organization, and location. Logistic regression was used to determine associations between buprenorphine treatment and individual, practice, and county characteristics.

Results: The questionnaire had a 100% response rate. After excluding FPs in noncontinuity practices and those who could not be linked to a US county, our final sample was 2726. Only 161 (5.9%) prescribed buprenorphine. Practice in a Federal Qualified Health Center (adjusted Odds Ratio [aOR] = 1.98 (95% CI, 1.08, 3.63)), in solo practice (aOR = 2.60 (1.38, 4.92)), or with a mental health professional (aOR = 2.70 (1.73, 4.22)) were positively associated with prescribing buprenorphine. Practice in a rural county or in a whole county mental health professional shortage area were not associated with buprenorphine prescribing.

Discussion: Few FPs prescribed buprenorphine, but those in practice settings with supporting mental health services were more likely to prescribe. With their training in the biopsychosocial model and a more even distribution across the rural continuum, FPs are perfectly situated to meet the increasing need for medication-assisted treatment. However, ensuring they have supporting mental health services will be central to having more FPs provide medication-assisted treatment. (J Am Board Fam Med 2020; 33:118 –123.)

Keywords: Buprenorphine, Family Physicians, Logistic Models, Mental Health Services, Opioid-Related Disorders, Opioids, Rural Health, Primary Health Care

In 2017 there were 70,237 drug overdose deaths in the US, with two thirds of these attributed to opioids.1 Medication-assisted treatment (MAT) with either methadone or buprenorphine is effective in reducing illicit substance use,2 but access to treatment can be challenging. Buprenorphine can be prescribed by clinicians who have completed additional training as part of their usual practice, but methadone can only be accessed at an outpatient treatment facility that patients visit daily. Analyses of the 2012 waivered clinician registry found that nationally there were 5.8 waivered physicians per 10,000 county residents and that family physicians (FPs) were the second most common physician

Conflict of interest: LEP and ZJM are employees of the American Board of Family Medicine.

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specially waivered at 3.6%, behind psychiatry. An update using the 2017 registry found that the availability of any clinician (nurse practitioners and physician assistants) gained the ability to become waivered since 2012) with a waiver increased to 10.3 per 10,000 county residents but rural disparities remained. Unfortunately, this updated analysis did not provide a breakdown by specialty, so the rate of growth in buprenorphine waivered FPs is unknown. Evidence of an increase in availability of MAT is corroborated by an analysis of ambulatory care visits from 2006–2008 and 2012–2014, that found the number of primary care visits where buprenorphine was prescribed increased 6.7-fold.5

Obtaining a waiver to prescribe buprenorphine is not sufficient for patient access as many physicians with a waiver report not using it. A significant barrier is access to mental health services, as counseling is a critical part of treatment, particularly during initiation. A survey of buprenorphine prescribers found that rural physicians were more likely to have patients use nonintegrated counseling services while physicians in urban areas were more likely to have integrated resources.7,8 Access to mental health resources is particularly problematic in rural areas due to lower clinician availability.9,10

While past research has documented disparities in location and logistic barriers to prescribing buprenorphine, it remains unknown if practice features are associated with prescribing buprenorphine. Our objective was to examine whether rurality of practice location, individual physician and practice characteristics, and county-level mental health services are associated with FPs’ prescribing of buprenorphine.

Methods
We used data from the 2017 and 2018 American Board of Family Medicine (ABFM) Family Medicine Certification Examination practice demographic registration questionnaire.11 The questionnaire is completed by FPs applying to continue their ABFM certification 3 to 4 months before the examination date. It is a required component of the registration process and has a 100% response rate. Examination cohorts are representative of the larger pool of ABFM diplomates.11 In both years, a representative 20% sample was given a question set, which also yields a 100% response rate, on additional scope of practice items, including buprenorphine prescribing.
county clustered analysis by calculating the intra-class correlation and found a value of 20%; however, nearly 90% of our rural sample were in counties by themselves, which inflated this value, and we conducted standard regression analyses. We used SAS Version 9.4 (Cary, NC) for all analyses. Our study was approved by the American Academy of Family Physicians Institutional Review Board.

Results
A total of 18,762 FPs completed the 2017 and 2018 questionnaires and 3753 completed the question set that asked about buprenorphine prescribing. Of these, 25 were excluded due to missing county information and 1002 were excluded for not providing continuity care, leaving a final sample size of 2726. Overall 5.9% prescribed buprenorphine. A majority were male, over age 50 years, white race, and held an MD degree (Table 1). Around a third were in hospital-owned or private practice, with 6.3% in a Federally Qualified Health Center (FQHC). Few FPs were in solo practices and slightly more than a third worked collaboratively with a mental health professional. Fifteen percent resided in a rural county and twenty percent lived in a whole-county mental health HPSA. In bivariate analyses, only presence of a mental health professional and practice organization were associated with buprenorphine prescribing with FPs in FQHCs and academic settings having the highest rates (Table 2). FPs in practices with a mental health professional prescribed buprenorphine at nearly double the rate (8.7% vs 4.4%) of those without.

We analyzed practice size by rural/urban location and found that rural FPs in both solo practice and large practices had higher prescribing rates, with solo rural FPs having the highest rate at 17% (Table 3). None of the 7 solo practice rural physicians indicated they held Addiction Medicine certification.

In adjusted analysis, no personal characteristics were associated with buprenorphine prescribing (Table 4). Working in an FQHC (adjusted Odds Ratio [aOR] = 1.98 (95% CI, 1.08, 3.63)) was positively associated with prescribing while working in a Health Maintenance Organization (aOR = 0.37 (0.14, 0.99)) or hospital-owned practice (aOR = 0.53 (0.33, 0.87)) were negatively associated with prescribing buprenorphine compared with private practice. FPs in solo practices had higher odds of prescribing compared with those in large practices (aOR = 2.60 (1.38, 4.92)). Working collaboratively with a mental health professional was positively associated with prescribing buprenorphine (aOR = 2.70 (1.73, 4.22)) while being in a mental health HPSA was not associated with prescribing. There was no association with rural location and prescribing.

Discussion
Using a large representative sample of FPs, we found that only 6% prescribed buprenorphine but that practice in an FQHC, solo practice, or having collaborative mental health were positively correlated with prescribing. These findings indicate that

Table 1. Physician, Practice, and County Characteristics of Family Physicians Registering to Continue their American Board of Family Medicine Certification in 2017 and 2018 (n = 2726)

|                                      | N (%)   |
|--------------------------------------|---------|
| Prescribes Buprenorphine             | 161 (5.9) |
| Physician characteristics            |         |
| Male gender                          | 1,556 (57.1) |
| Age ≥50 years                        | 1,492 (54.7) |
| White race                           | 1,972 (72.3) |
| Hispanic ethnicity                   | 189 (6.9) |
| MD degree vs. DO degree              | 2,458 (90.2) |
| International medical graduate       | 600 (22.0) |
| Practice characteristics             |         |
| Practice organization                |         |
| Academic health center               | 186 (6.8) |
| Federally qualified health center    | 173 (6.3) |
| Federal                              | 90 (3.3) |
| Health maintenance organization      | 173 (6.3) |
| Hospital owned                       | 917 (33.6) |
| Miscellaneous/other                  | 125 (4.6) |
| Other public                         | 128 (4.7) |
| Private practice                     | 934 (34.3) |
| Site size                            |         |
| Solo practice                        | 306 (11.2) |
| 2 to 5 providers                     | 938 (34.4) |
| 6 to 20 providers                    | 838 (30.7) |
| >20 providers                        | 644 (23.6) |
| Any mental health professional       | 967 (35.5) |
| County characteristics               |         |
| Whole county health professional     | 519 (19.0) |
| shortage area—mental health          |         |
| Rural county                         | 405 (14.9) |
Table 2. Physician, Practice, and County Characteristics of Family Physicians Registering to Continue their American Board of Family Medicine Certification in 2017 and 2018 by Whether they Prescribe Buprenorphine (n = 2726)

| Physician characteristics | Prescribes Buprenorphine, N (%) | Does not Prescribe Buprenorphine, N (%) |
|--------------------------|---------------------------------|----------------------------------------|
| Gender                   |                                 |                                        |
| Male                     | 100 (6.4)                       | 1456 (93.6)                            |
| Female                   | 61 (5.2)                        | 1109 (94.8)                            |
| Age                      |                                 |                                        |
| Under 50                 | 67 (5.4)                        | 1167 (94.6)                            |
| 50 or older              | 94 (6.3)                        | 1398 (93.7)                            |
| Race                     |                                 |                                        |
| White                    | 113 (5.7)                       | 1859 (94.3)                            |
| Non-White                | 48 (6.4)                        | 706 (93.6)                             |
| Ethnicity                |                                 |                                        |
| Hispanic or Latino       | 13 (6.9)                        | 176 (93.1)                             |
| Not Hispanic             | 148 (5.8)                       | 2389 (94.2)                            |
| Degree type              |                                 |                                        |
| DO                       | 13 (4.9)                        | 255 (95.1)                             |
| MD                       | 148 (6.0)                       | 2310 (94.0)                            |
| International medical graduate |                      |                                        |
| Yes                      | 35 (5.8)                        | 565 (94.2)                             |
| No                       | 126 (5.9)                       | 1993 (94.1)                            |
| Practice characteristics |                                 |                                        |
| Practice Organization*   |                                 |                                        |
| Academic Health Center   | 19 (10.2)                       | 167 (89.8)                             |
| Federally qualified health center | 27 (15.6)                        | 146 (84.4)                             |
| Federal                  | 2 (2.2)                         | 88 (97.8)                              |
| Health maintenance organization | 5 (2.9)                       | 168 (97.1)                             |
| Hospital owned           | 31 (3.4)                        | 886 (96.6)                             |
| Miscellaneous/other      | 9 (7.2)                         | 116 (92.8)                             |
| Other public             | 8 (6.3)                         | 120 (93.8)                             |
| Private practice         | 60 (6.4)                        | 874 (93.6)                             |
| Site size                |                                 |                                        |
| Solo practice            | 28 (9.2)                        | 278 (90.8)                             |
| 2 to 5 providers         | 51 (5.4)                        | 887 (94.6)                             |
| 6 to 20 providers        | 42 (5.0)                        | 796 (95.0)                             |
| >20 providers            | 40 (6.2)                        | 604 (93.8)                             |
| Any mental health professional* |                   |                                        |
| Yes                      | 84 (8.7)                        | 883 (91.3)                             |
| No                       | 77 (4.4)                        | 1682 (95.6)                            |
| County characteristics   |                                 |                                        |
| Whole county health professional shortage area—mental health |                           |                                        |
| Yes                      | 26 (5.0)                        | 493 (95.0)                             |
| No                       | 135 (6.1)                       | 2072 (93.9)                            |
| Rurality                 |                                 |                                        |
| Rural                    | 26 (6.4)                        | 379 (93.6)                             |
| Urban                    | 135 (5.8)                       | 2186 (94.2)                            |

*P value for \(\chi^2\) test < .05.
few FP s are prescribing buprenorphine but reinforces past work that those in practices with mental health resources, which includes FQHCs, are more likely prescribe.6,14

Prior work found that rural buprenorphine prescribers were less likely to be in solo practices.7 We found that solo practice was positively and significantly associated with prescribing buprenorphine and that rural FPs in solo practice settings had the highest rates of prescribing. We suspected these FPs might hold additional certification in addiction medicine and may be running an addiction focused practice but, none held addiction certification. This finding, together with lack of association between mental health HPSA status and prescribing suggests that FPs in any practice setting can overcome access barriers to mental health care for their opioid use disorder (OUD) patients. However, past work documented a sharp decline in the colocation of primary care physicians with both psychologists and behavioral health clinicians with increasing rurality,15 indicating a policy lever to support FPs treating OUD.

Other reports of ABFM data found that the percent of graduating residents and early-career FPs who intend, or are, prescribing buprenorphine is higher than that of mid-to-late career FP’s and is increasing.13 These findings indicate that early career FPs may be more likely to prescribe as addiction medicine training is becoming more common in family medicine residencies16 but, that other educational or practice changes will need to occur to induce FPs further from training to prescribe buprenorphine.

Our study is subject to limitations. First, our data are cross-sectional and we cannot infer causality. Second, we lacked data on how many patients FPs are treating and there may be differential associations for those treating 100, or more, patients. Third, despite a large overall sample size, with only 6% prescribing and 15% rural, we lacked power to run stratified analyses or test for interactions.

In conclusion, we found that few FPs prescribed buprenorphine but, those with practice settings and features supporting mental health services were more likely to prescribe. With training in the bio-

### Table 3. Percent of Family Physicians Prescribing Buprenorphine by Primary Practice Site Size and Rural/Urban Status in 2017 and 2018

| Site size                      | Rural, N (%) | Urban, N (%) | Total, N (%) |
|-------------------------------|--------------|--------------|--------------|
| Solo practice (n = 306)       | 7 (17.1)     | 21 (7.9)     | 28 (9.2)     |
| 2 to 5 providers (n = 938)    | 6 (3.3)      | 45 (6.0)     | 51 (5.4)     |
| 6 to 20 providers (n = 838)   | 9 (6.4)      | 33 (4.7)     | 42 (5.0)     |
| >20 providers (n = 644)       | 4 (9.8)      | 36 (6.0)     | 40 (6.2)     |

Number and percent represent the percentage of family physicians in each size of practice who prescribe buprenorphine.

### Table 4. Adjusted Associations between Personal, Practice, and County Characteristics with Family Physicians Prescribing Buprenorphine in 2017 and 2018

|                          | Odds Ratio (95% CI) |
|--------------------------|---------------------|
| **Physician characteristics** |                     |
| Male gender              | 1.39 (0.97, 1.97)   |
| Age ≥ 50 years           | 1.03 (0.73, 1.46)   |
| White race               | 0.82 (0.55, 1.22)   |
| Hispanic ethnicity       | 1.18 (0.63, 2.22)   |
| MD degree vs. DO degree  | 1.01 (0.55, 1.84)   |
| International medical graduate | 1.08 (0.69, 1.68) |
| **Practice characteristics** |                     |
| Academic health center   | 1.29 (0.67, 2.48)   |
| Federally qualified health center | 1.98 (1.08, 3.63) |
| Federal                  | 0.24 (0.05, 1.03)   |
| Health maintenance organization | 0.37 (0.14, 0.99) |
| Hospital owned           | 0.53 (0.33, 0.87)   |
| Miscellaneous/other      | 0.97 (0.45, 2.08)   |
| Private practice         | Reference           |
| Other public             | 0.84 (0.36, 1.93)   |
| **Site size**            |                     |
| Solo practice            | 2.60 (1.38, 4.92)   |
| 2 to 5 providers         | 1.48 (0.89, 2.45)   |
| 6 to 20 providers        | 0.90 (0.56, 1.44)   |
| >20 providers            | Reference           |
| Any mental health professional | 2.70 (1.73, 4.22) |
| **County characteristics** |                     |
| Health professional shortage area—mental health | 0.72 (0.42, 1.23) |
| Rural County             | 1.28 (0.73, 2.23)   |

CI, confidence interval
psychosocial model, and whole-person orientation, and a more even distribution with the population across the rural continuum, FPs are perfectly situated to meet increasing need for MAT. However, ensuring they have supporting mental health services may be central to more FPs providing MAT.

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