

## Buprenorphine uptake during pregnancy following the 2017 guidelines update on prenatal opioid use disorder

**OBJECTIVE:** Prenatal opioid use disorder (OUD) has significantly risen, from 3.5 to 8.2 per 1000 deliveries between 2010 and 2017.<sup>1</sup> In August 2017, options for the treatment of prenatal OUD expanded from methadone only: the American College of Obstetricians and Gynecologists (ACOG) and American Society of Addiction Medicine (ASAM) committee opinion on opioid use and OUD in pregnancy recommended buprenorphine as a noninferior alternative first-line treatment for prenatal OUD.<sup>2</sup> However, evidence shows that pregnant patients receive medications for OUD at low rates<sup>3</sup> and face barriers when seeking treatment (especially concerning accessing buprenorphine)<sup>4</sup> and that few obstetrician-gynecologists are licensed to prescribe buprenorphine.<sup>5</sup> Therefore, we sought to determine the influence of these guidelines on buprenorphine uptake among pregnant individuals with OUD.

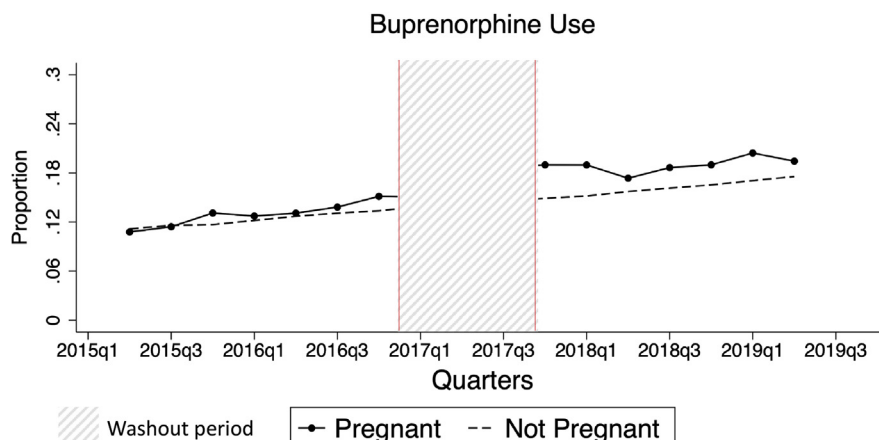
**STUDY DESIGN:** We analyzed 2014–2019 MarketScan Commercial Claims and Encounters Data. The longitudinal sample was composed of women aged 15 to 45 years with diagnosed OUD. Using causal inference methods, we estimated difference-in-differences models comparing changes in buprenorphine use before and after the ACOG-ASAM guideline between pregnant and nonpregnant (control group) women with OUD. Our policy variable of interest was the interaction between the postguideline and

pregnancy indicators. Recognizing that there are likely individual characteristics correlated to both the exposure and outcome, we included individual-level fixed effects to capture all individual-specific time-invariant determinants of buprenorphine receipt. We regressed our buprenorphine outcomes on the policy interaction, pregnancy indicator, postguideline indicator, and individual fixed effects using ordinary least squares. We evaluated the difference-in-differences assumption of parallel trends in the exposure categories graphically. We chose this specific difference-in-differences approach, with nonpregnant women as a comparison group, to account for confounding factors affecting buprenorphine uptake and correlated with the guideline changes during this period. A *P* value threshold of .05 was used to determine statistical significance. Analyses were performed with Stata (version 16; StataCorp, College Station, TX). The Boston University Medical Campus Institutional Review Board ruled this study as Not Human Subjects Research.

**RESULTS:** Among 86,522 unique women included, 2137 (2.5%) were pregnant at least once during the study period. The mean (standard deviation) ages at baseline were 27.6 (6.0) years in the pregnant group and 30.9 (7.9) years in the control group (shown in the online [Supplemental Table](#)). Most patients resided in urban settings (70,704 [81.7%]).

### FIGURE

#### Buprenorphine administration by pregnancy status during the study period



ACOG, American College of Obstetricians and Gynecologists; ASAM, American Society of Addiction Medicine.

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Our individual-level fixed effects model found a 2.1 percentage point (95% confidence interval [CI], 1.0–3.2) increase in the prevalence of buprenorphine use among pregnant women compared with nonpregnant women with OUD following the guideline change, corresponding to a 12% increase relative to the preguideline period (see [Figure](#)). In a sensitivity analysis, we excluded the year 2017, and the results remained similar (2.3%; 95% CI, 0.8–3.7;  $P < .001$ ). Buprenorphine initiation rates increased after guideline release among those with no previous history of treatment from 12 initiations per 100 person-years (PY) to 13 per 100 PY in nonpregnant women and from 17 initiations per 100 PY to 21 per 100 PY in pregnant women (both  $P < .01$ ).

**CONCLUSION:** Our findings suggested that the ACOG-ASAM 2017 OUD guidelines led to increased buprenorphine uptake among pregnant women with OUD compared with nonpregnant women. Professional society guidelines could be an effective tool to address the current US drug overdose epidemic.

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## SUPPLEMENTAL TABLE

## Demographic characteristics of women with opioid use disorder by pregnancy history during the study period

Characteristic	All (N = 86,522)	Never pregnant (n = 84,385)	Ever pregnant (n = 2137)	Chi-squared P value
Study sample				
Administration at any time (buprenorphine quarters)	85,818 (15.1)	82,188 (15.0)	3630 (17.4)	<.01
Initiation, rates per 100 person-years	15,818 (12.7)	15,001 (12.5)	817 (18.1)	—
Preguideline initiation	10,379 (12.4)	9852 (12.2)	527 (16.8)	<.01
Postguideline initiation	5439 (13.4)	5149 (13.1)	290 (21.0)	
Age at first enrollment (y), mean (SD)	30.8 (7.9)	30.9 (7.9)	27.6 (6.0)	
<30	38,599 (44.6)	37,290 (44.2)	1309 (61.2)	<.01
≥30	47,923 (55.3)	47,095 (55.8)	828 (38.7)	
Regions				
Northeast	17,462 (20.2)	17,004 (20.2)	458 (21.4)	<.01
Midwest	15,426 (17.8)	14,970 (17.7)	456 (21.3)	
South	39,494 (45.6)	38,582 (45.7)	912 (42.7)	
West	13,371 (15.5)	13,076 (15.5)	295 (13.8)	
Unknown	769 (0.9)	753 (0.9)	16 (0.7)	
Urban	70,704 (81.7)	68,970 (81.7)	1734 (81.1)	.49
Health plan types				
PPO	51,007 (59.0)	49,735 (58.9)	1272 (59.5)	<.01
HMO	7043 (8.1)	6860 (8.1)	183 (8.6)	
POS	7184 (8.3)	7074 (8.4)	110 (5.1)	
Other	21,288 (24.6)	20,716 (24.5)	572 (26.8)	
Comorbid substances at any time				
Alcohol	18,117 (20.9)	17,738 (21.0)	379 (17.7)	<.01
Amphetamines	8925 (10.3)	8721 (10.3)	204 (9.5)	.27
Cannabis	11,221 (13.0)	10,929 (13.0)	292 (13.7)	.33
Cocaine	8339 (9.6)	8116 (9.6)	223 (10.4)	.21
Hallucinogens	868 (1)	858 (1.0)	10 (0.5)	.01
Sedative	12,686 (14.7)	12,406 (14.7)	280 (13.1)	.04
Relationship to employee				
Employee	34,755 (40.2)	34,090 (40.4)	665 (31.1)	<.01
Spouse	24,568 (28.4)	23,965 (28.4)	603 (28.2)	
Child or other dependent	27,200 (31.4)	26,330 (31.2)	870 (40.7)	

Data are presented as number (percentage), unless otherwise specified.

HMO, health maintenance organization; POS, point of service; PPO, preferred provider organization; SD, standard deviation.

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