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## Use of buprenorphine for those with employer-sponsored insurance during the initial phase of the COVID-19 pandemic

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### ABSTRACT

**Objective:** To quantify weekly rates of use of buprenorphine for those with employer-based insurance and whether the rate differs based on county-level measures of race, historical fatal drug overdose rate, and COVID-19 case rate.

**Methods:** We used 2020 pharmaceutical claims for 4.8 million adults from a privately insured population to examine changes in the use of buprenorphine to treat opioid use disorder in 2020 during the onset of the COVID-19 pandemic. We quantified variation by examining changes in use rates across counties based on their fatal drug overdose rate in 2018, number of COVID-19 cases per capita, and percent nonwhite.

**Results:** Weekly use of buprenorphine was relatively stable between the first week of January (0.6 per 10,000 enrollees, 95%CI = 0.2 to 1.1) and the last week of August (0.8 per 10,000 enrollees, 95%CI = 0.4 to 1.3). We did not find evidence of any consistent change in use of buprenorphine by county-level terciles for COVID-19 rate as of August 31, 2020, age-adjusted fatal drug overdose rate, and percent nonwhite. Use was consistently higher for counties in the highest tercile of county age-adjusted fatal drug overdose rate when compared to counties in the lowest tercile of county age-adjusted fatal drug overdose rate.

**Discussion:** Our results provide early evidence that new federal- and state-level policies may have steadied the rate of using buprenorphine for those with employer-based insurance during the pandemic.

### 1. Introduction

The COVID-19 pandemic has dramatically decreased certain health care utilization in the United States (Hartnett, 2020). Recent data indicate an increase in opioid-related overdose deaths, which suggests an increased need for opioid use disorder treatment (Centers for Disease Control and Prevention, 2020a). Government officials and treatment providers recognized the importance of maintaining uninterrupted access to medications for opioid use disorder (MOUD), including those typically available in outpatient settings like buprenorphine (Becker & Fiellin, 2020). Both federal and state governments have eased restrictions on MOUD initiation and prescribing accordingly. For example, as of March 2020, buprenorphine-waivered prescribers could initiate

buprenorphine treatment remotely via telemedicine—something that previously had required an in-person visit (Substance Abuse and Mental Health Services Administration, 2020a). The Substance Abuse and Mental Health Services Administration (SAMHSA) has also allowed for a state to request a blanket exception for all stable patients in an opioid treatment program to receive 28 days of take-home doses of MOUD and 14 days of take-home doses for less stable patients (Substance Abuse and Mental Health Services Administration, 2020b).

Several studies have examined national trends in the use of buprenorphine during the pandemic (Cance & Doyle, 2020; Huskamp et al., 2020; Nguyen et al., 2020). We are unaware of national studies that use county-level data to examine changes in treatment for opioid use disorder during the pandemic. County-level analyses can inform if there are

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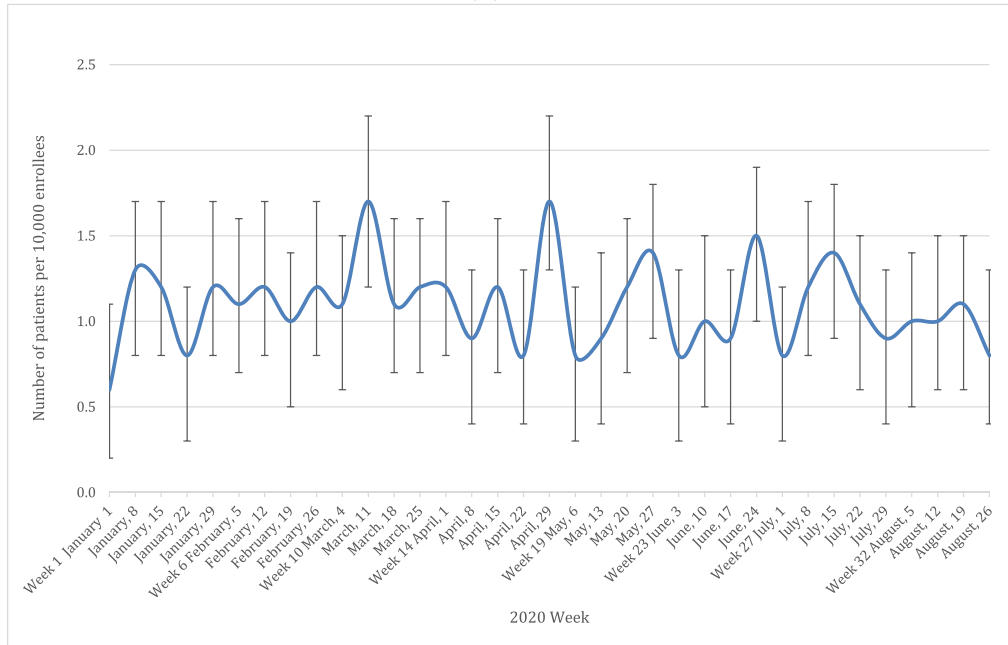
local disparities in the treatment of opioid use disorder during the COVID-19 pandemic. To enhance understanding of the pandemic's impact on medications that are used to treat opioid use disorder, this paper examines buprenorphine use in a commercially insured population during 2020. We examine temporal changes overall and by county characteristics previously associated with variation in the use of MOUD or health care use: percent of white residents (Haffajee et al., 2019; Stein

et al., 2018), age-adjusted fatal drug overdose rate (Haffajee et al., 2019), and COVID-19 case rate (Gluckman et al., 2020).

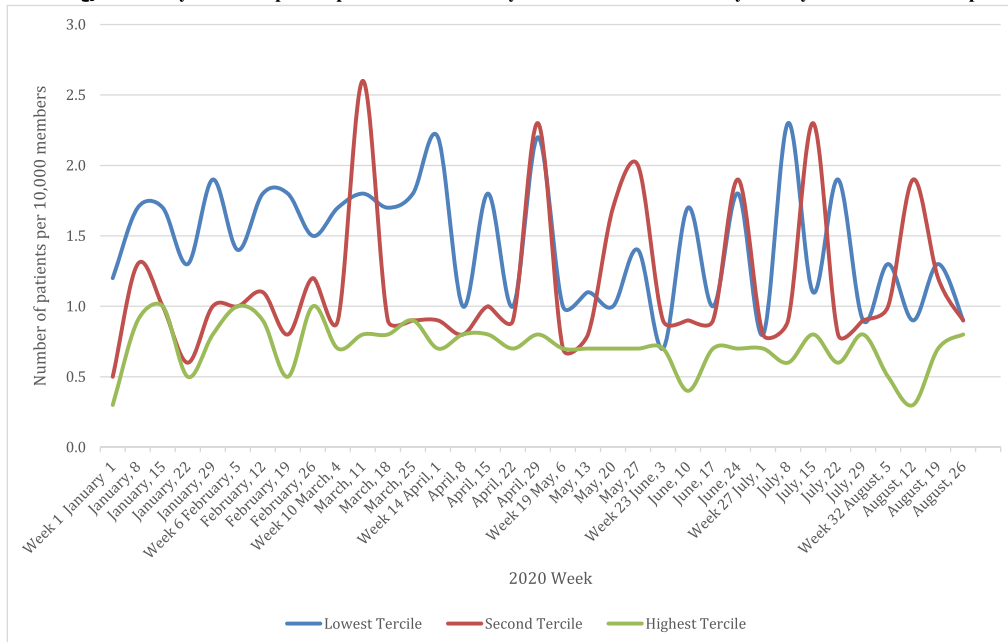
## 2. Methods

We used employer-based pharmaceutical claims from January 1 to August 31, 2020, for 4.8 million adults 19 years of age or older from

**A: Change in weekly use of buprenorphine for adults 19 years of age or older between January 1, 2020 and August 31, 2020<sup>a</sup>**



**B: Change in weekly use of buprenorphine for adults 19 years or older stratified by county COVID-19 cases per capita<sup>a</sup>**



**Fig. 1.** Panel A: Change in weekly use of buprenorphine for adults 19 years of age or older between January 1, 2020 and August 31, 2020<sup>a</sup>.

<sup>a</sup>Regression model only includes week fixed effects where the baseline for all comparisons is the ninth week, when COVID-19 was declared a national public health emergency. Error bars represent 95% confidence interval.

Panel B: Change in weekly use of buprenorphine for adults 19 years or older stratified by county COVID-19 cases per capita<sup>a</sup>.

<sup>a</sup>Tertiles are based on number of COVID-19 cases on August 31st, 2020 per 10,000 population from USAFacts (<https://usafacts.org/issues/coronavirus/>).

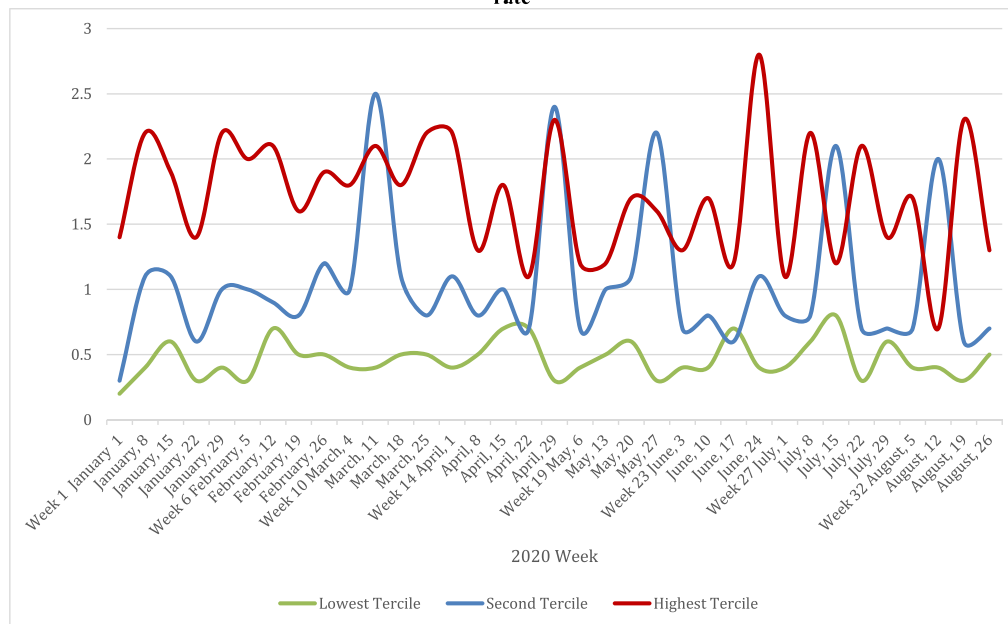
Each line represents a separate regression model that only includes week fixed effects where the baseline for all comparisons is the ninth week, the week prior to COVID-19 being declared a national public health emergency.

Castlight Health. Castlight Health aggregates medical and pharmaceutical claims from self-insured employers and health plans that purchase access to their transparency platform. The data are from approximately 200 self-funded employers and contain patients from all 50 states. We calculated weekly rates of the number of filled buprenorphine prescriptions per 10,000 enrolled adults, excluding formulations indicated for treatment of pain. Several other studies have used the Castlight

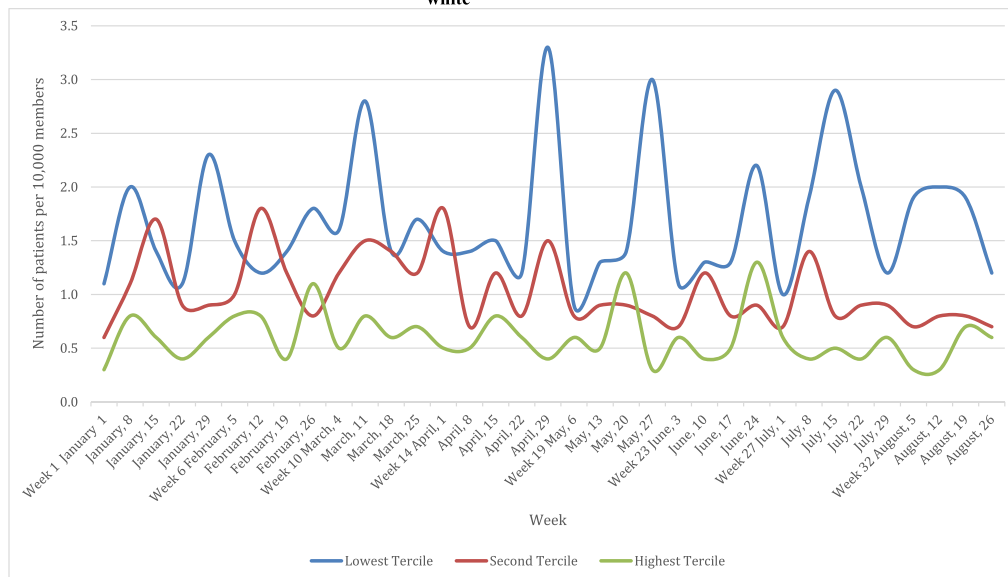
Health data to examine changes in health care utilization during the COVID-19 pandemic (Cantor et al., 2020; Whaley et al., 2020). The sample of beneficiaries has a similar age and gender distribution as the American Community Survey, an annual survey that the United States Census Bureau conducts that collects key demographic data (US Census Bureau, 2021).

This study obtained information on county-level race/ethnicity from

**A: Change in weekly use of buprenorphine for adults 19 years stratified by county age-adjusted fatal drug overdose rate<sup>a</sup>**



**B: Change in weekly use of buprenorphine for adults 19 years or older stratified by percent of the county that is non-white<sup>a</sup>**



**Fig. 2.** Panel A: Change in weekly use of buprenorphine for adults 19 years stratified by county age-adjusted fatal drug overdose rate<sup>a</sup>. <sup>a</sup>County-level age-adjusted fatal drug overdose rate is used to create each tercile and the underlying data are from Centers for Disease Control and Prevention data in 2018 (<https://data.cdc.gov/NCHS/NCHS-Drug-Poisoning-Mortality-by-County-United-Sta/rpvx-m2md>). Each line represents a separate regression model that only includes week fixed effects where the baseline for all comparisons is the ninth week, the week prior to COVID-19 being declared a national public health emergency. Panel B: Change in weekly use of buprenorphine for adults 19 years or older stratified by percent of the county that is non-white<sup>a</sup>. <sup>a</sup>Based on share of U.S. county (percent) that is not white in the American Community Survey (<https://api.census.gov/data/2018/acs/acs5/profile/groups/DP05.html>). Each line represents a separate regression model that only includes week fixed effects where the baseline for all comparisons is the ninth week, the week prior to COVID-19 being declared a national public health emergency.

the 2018 American Community Survey (United States Census Bureau, 2020). County age-adjusted fatal drug overdose rate is from the publicly available National Vital Statistics System multiple cause-of-death mortality data from the National Center for Health Statistics (Centers for Disease Control and Prevention, 2020b). We used data from USAFacts (USAFacts, 2020), aggregated from the Centers for Disease Control and Prevention and state health departments, to calculate the number of county COVID-19 cases and population as of August 31, 2020. We classified each county by their respective tercile for each measure.

We estimated a regression model that predicts weekly use of buprenorphine in each county and separately by fatal drug overdose rate, COVID-19 cases per capita as of August 31, 2020, and by percent of nonwhite residents. The regression model used week nine of 2020 as the baseline for comparison, as it was just before the national declaration of COVID-19 as a public health emergency. We graphically present weekly regression-adjusted means. We also estimated similar regression models that include county fixed effects as a robustness check and to control for time invariant characteristics of each county. We report 95% confidence intervals for the results. This study used Stata version 15.1 for all analyses (StataCorp, 2017). The RAND Human Subjects Protection Committee approved the study.

### 3. Results

Overall use of buprenorphine was relatively stable between the first week of January (0.6 per 10,000 enrollees, 95%CI = 0.2 to 1.1) and the last week of August (0.8 per 10,000 enrollees, 95%CI = 0.4 to 1.3) (Fig. 1A) (Appendix 1). We failed to find evidence of any consistent change in use of buprenorphine by COVID-19 rate as of August 31, 2020. (Fig. 1B). The stable trends in buprenorphine rates are shown visually; each line within the figure represents a separate regression model for the tercile to which the county belonged. We also found no consistent statistically significant changes in the use of buprenorphine over time by county age-adjusted fatal drug overdose rate terciles and percent nonwhite terciles (Fig. 2). Use of buprenorphine was consistently higher for counties in the highest tercile of county age-adjusted fatal drug overdose rate when compared to counties in the lowest tercile of county age-adjusted fatal drug overdose rate. In general, the results were similar when estimating the same model with county fixed effects included.

### 4. Discussion

We used a nationwide sample of privately insured individuals to examine the impacts of the COVID-19 pandemic on use of buprenorphine for adults 19 years of age or older, finding that the rate of use of buprenorphine remained stable during the early stages of the pandemic. The national results are consistent with other recent studies during the initial stage of the COVID-19 pandemic (Huskamp et al., 2020; Nguyen et al., 2020). The current study adds important new information using county-level data. We find that the rate of use of buprenorphine was consistent across county-level characteristics, including age-adjusted fatal drug overdose rate, number of COVID-19 cases per capita, and percent of nonwhite county residents. We note the substantial variation in the number of buprenorphine claims each week, as exhibited by the large confidence intervals in Fig. 1. While we found substantial variation in the number of buprenorphine prescriptions filled weekly, we found that the overall rate of buprenorphine prescription fills remained steady during the early stages of the pandemic.

This study is not without limitations. First, while we used claims from a large and diverse commercially insured study population, we do not know if our findings generalize to other commercially insured populations, Medicaid enrollees, or the uninsured. We note that during the pandemic, research found considerable increases in the number of individuals with Medicaid insurance (Lucia et al., 2020), as well as increases in the share of uninsured individuals and declines in the number of commercially insured individuals. Future studies should examine

whether similar results are found for each of these populations (Gangopadhyaya et al., 2020). We also did not examine methadone treatment of opioid use disorder, given that it is seldom used in commercially insured populations (Polsky et al., 2019). Third, there may be differences in the ability to detect COVID-19 cases across counties based on county-level sociodemographic factors. We did not adjust for these dynamics. Fourth, we are not able to identify new buprenorphine prescriptions versus continued prescriptions, nor are we able to identify buprenorphine being used off label for treatment of pain. Fifth, we used 2018 overdose data as a proxy for severity of the opioid crisis within a county, while recognizing the limitations of overdose data in reflecting the severity of opioid crisis in a county, and that 2018 data, the most recent overdose data available, may not accurately reflect the situation in 2020. Recent data during the pandemic indicate that there has been a substantial increase in the number of drug overdoses (Centers for Disease Control and Prevention, 2021). Finally, we did not evaluate the impacts of specific changes in federal and state policies related to MOUD use due to the pandemic, another area ripe for future studies.

The COVID-19 pandemic has prompted substantial regulatory changes in the opioid use disorder treatment landscape. Policy-makers have implemented multiple policies to facilitate remote medication treatment and safer in-person services. These policies may be helping patients with employer-based insurance maintain continuity of MOUD treatment. However, more work is needed to evaluate specific policies, including state MOUD policies pursuant to SAMHSA's guidance and other state emergency declarations, and how they have impacted use of MOUD. Similarly, studies must look at populations that either have other forms of insurance or lack insurance. The COVID-19 pandemic has had a disproportionately severe effect on communities of color (Khanzanchi et al., 2020). Additional efforts need to understand and address disparities and differential access to MOUD during and beyond the pandemic. In addition, if there is increased demand for opioid use disorder treatment, then the current levels of MOUD treatment may be inadequate and additional steps may be needed to enhance access to MOUD. Finally, the current study is not able to examine the health impacts of COVID-19 on opioid use disorder outcomes, but future work must examine how COVID-19 has impacted health care outcomes for those with opioid use disorder.

### 5. Conclusion

Our results highlight that use of buprenorphine remained relatively stable for those with employer-based insurance despite the dramatic changes to the health care delivery system and insurance status created by the COVID-19 pandemic. Policy-makers and public health officials should continue to monitor and track MOUD use and evaluate policies enacted during the pandemic.

#### CRediT authorship contribution statement

Jonathan Cantor: Conceptualization, methodology, data curation, data analysis, project management, writing.

Andrew W. Dick: Methodology, data analysis, writing.

Rebecca Haffajee: Data curation, data analysis, writing.

Megan F. Pera: Data curation, writing.

Dena M. Bravata: Data curation, writing.

Bradley D. Stein: Conceptualization, data analysis, writing.

Christopher Whaley: Conceptualization, methodology, data curation, project management, writing.

The contents of this article have not been previously published or presented.

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article do not necessarily reflect the official views or policy of her current employer, the U.S. Department of Health and Human Services, or the U.S. Government.

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**Appendix 1**

**Appendix Table 1**

Weekly regression adjusted means for buprenorphine use between January 1, 2020 and August 31, 2020.

	Terciles of COVID-19 cases per capita for all counties <sup>a</sup>				Terciles of percent non-white from ACS <sup>b</sup>			Terciles of age-adjusted fatal drug overdose rate <sup>c</sup>		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	All	Lowest	Second	Highest	Lowest	Second	Highest	Lowest	Second	Highest
Week 1	0.6 (0.2-1.1) <sup>d</sup>	1.2 (0.3-2.0)	0.5 (-0.6-1.5)	0.3 (0.0-0.6)	1.1 (-0.1-2.3)	0.6 (-0.0-1.1)	0.3 (-0.2-0.7)	0.2 (-0.2-0.5)	0.3 (-0.7-1.4)	1.4 (0.6-2.2)
Week 2	1.3 (0.8-1.7)	1.7 (0.8-2.5)	1.3 (0.2-2.3)	0.9 (0.6-1.2)	2.0 (0.8-3.2)	1.1 (0.5-1.6)	0.8 (0.4-1.3)	0.4 (0.1-0.7)	1.1 (0.1-2.2)	2.2 (1.4-3.0)
Week 3	1.2 (0.8-1.7)	1.7 (0.9-2.5)	1.0 (-0.0-2.1)	1.0 (0.7-1.3)	1.4 (0.2-2.6)	1.7 (1.1-2.2)	0.6 (0.2-1.1)	0.6 (0.3-1.0)	1.1 (0.0-2.1)	1.9 (1.1-2.7)
Week 4	0.8 (0.3-1.2)	1.3 (0.5-2.1)	0.6 (-0.4-1.7)	0.5 (0.2-0.8)	1.1 (-0.1-2.3)	0.9 (0.3-1.5)	0.4 (-0.0-0.9)	0.3 (-0.0-0.6)	0.6 (-0.4-1.7)	1.4 (0.6-2.2)
Week 5	1.2 (0.8-1.7)	1.9 (1.1-2.7)	1.0 (-0.1-2.1)	0.8 (0.5-1.1)	2.3 (1.1-3.5)	0.9 (0.3-1.4)	0.6 (0.1-1.0)	0.4 (0.0-0.7)	1.0 (-0.1-2.0)	2.2 (1.4-3.0)
Week 6	1.1 (0.7-1.6)	1.4 (0.5-2.2)	1.0 (-0.0-2.1)	1.0 (0.7-1.3)	1.5 (0.3-2.7)	1.0 (0.4-1.6)	0.8 (0.4-1.2)	0.3 (0.0-0.7)	1.0 (-0.1-2.0)	2.0 (1.2-2.8)
Week 7	1.2 (0.8-1.7)	1.8 (0.9-2.6)	1.1 (0.0-2.2)	0.9 (0.6-1.3)	1.2 (-0.0-2.4)	1.8 (1.2-2.3)	0.8 (0.3-1.2)	0.7 (0.4-1.0)	0.9 (-0.2-1.9)	2.1 (1.3-2.9)
Week 8	1.0 (0.5-1.4)	1.8 (0.9-2.6)	0.8 (-0.2-1.9)	0.5 (0.2-0.8)	1.4 (0.2-2.6)	1.2 (0.6-1.8)	0.4 (-0.0-0.9)	0.5 (0.2-0.9)	0.8 (-0.3-1.8)	1.6 (0.8-2.4)
Week 9	1.2 (0.8-1.7)	1.5 (0.7-2.4)	1.2 (0.2-2.3)	1.0 (0.7-1.3)	1.8 (0.6-3.0)	0.8 (0.2-1.4)	1.1 (0.7-1.6)	0.5 (0.2-0.9)	1.2 (0.2-2.3)	1.9 (1.1-2.7)
Week 10	1.1 (0.6-1.5)	1.7 (0.9-2.5)	0.9 (-0.1-2.0)	0.7 (0.4-1.0)	1.6 (0.4-2.8)	1.2 (0.6-1.8)	0.5 (0.1-1.0)	0.4 (0.1-0.7)	1.0 (-0.0-2.1)	1.8 (1.0-2.6)
Week 11	1.7 (1.2-2.2)	1.8 (0.9-2.6)	2.6 (1.5-3.6)	0.8 (0.5-1.1)	1.7 (1.6-4.0)	1.5 (1.0-2.1)	2.8 (0.4-1.3)	0.8 (0.1-0.7)	2.5 (1.5-3.5)	2.1 (1.3-2.9)
Week 12	1.1 (0.7-1.6)	1.7 (0.9-2.6)	0.9 (-0.2-2.0)	0.8 (0.5-1.2)	1.4 (0.2-2.6)	1.4 (0.8-2.0)	0.6 (0.1-1.0)	0.5 (0.2-0.8)	1.1 (0.0-2.1)	1.8 (1.0-2.6)
Week 13	1.2 (0.7-1.6)	1.8 (1.0-2.6)	0.9 (-0.2-2.0)	0.9 (0.6-1.2)	1.7 (0.5-2.9)	1.2 (0.6-1.8)	0.7 (0.3-1.1)	0.5 (0.2-0.9)	0.8 (-0.3-1.8)	2.2 (1.4-3.0)
Week 14	1.2 (0.8-1.7)	2.2 (1.4-3.1)	0.9 (-0.2-1.9)	0.7 (0.4-1.0)	1.4 (0.2-2.6)	1.8 (1.3-2.4)	0.5 (0.1-1.0)	0.4 (0.1-0.7)	1.1 (0.0-2.1)	2.2 (1.4-3.0)
Week 15	0.9 (0.4-1.3)	1.0 (0.1-1.8)	0.8 (-0.2-1.9)	0.8 (0.5-1.1)	1.4 (0.2-2.6)	0.7 (0.1-1.3)	0.5 (0.1-1.0)	0.5 (0.2-0.8)	0.8 (-0.3-1.8)	1.3 (0.5-2.1)
Week 16	1.2 (0.7-1.6)	1.8 (1.0-2.6)	1.0 (-0.1-2.1)	0.8 (0.5-1.1)	1.5 (0.3-2.7)	1.2 (0.6-1.8)	0.8 (0.4-1.2)	0.7 (0.4-1.0)	1.0 (-0.1-2.0)	1.8 (1.0-2.6)
Week 17	0.8 (0.4-1.3)	1.0 (0.1-1.8)	0.9 (-0.2-1.9)	0.7 (0.4-1.0)	1.2 (-0.0-2.4)	0.8 (0.2-1.4)	0.6 (0.1-1.0)	0.7 (0.3-1.0)	0.7 (-0.3-1.8)	1.1 (0.3-1.9)
Week 18	1.7 (1.3-2.2)	2.2 (1.3-3.0)	2.3 (1.2-3.4)	0.8 (0.5-1.1)	3.3 (2.1-4.6)	1.5 (1.0-2.1)	3.4 (-0.1-0.8)	0.4 (0.0-0.7)	2.4 (1.4-3.5)	2.3 (1.5-3.1)
Week 19	0.8 (0.3-1.2)	1.0 (0.1-1.8)	0.7 (-0.4-1.8)	0.7 (0.4-1.0)	0.9 (-0.3-2.1)	0.8 (0.2-1.4)	0.6 (0.2-1.0)	0.4 (0.1-0.7)	0.7 (-0.3-1.8)	1.2 (0.4-2.0)
Week 20	0.9 (0.4-1.4)	1.1 (0.3-2.0)	0.8 (-0.2-1.9)	0.7 (0.4-1.0)	1.3 (0.1-2.5)	0.9 (0.3-1.4)	0.5 (0.1-1.0)	0.5 (0.1-0.8)	1.0 (-0.1-2.0)	1.2 (0.4-2.0)
Week 21	1.2 (0.7-1.6)	1.0 (0.1-1.8)	1.7 (0.7-2.8)	0.7 (0.4-1.0)	1.4 (0.2-2.6)	0.9 (0.3-1.5)	1.2 (0.7-1.6)	0.6 (0.3-1.0)	1.1 (0.0-2.1)	1.7 (0.9-2.5)
Week 22	1.4 (0.9-1.8)	1.4 (0.5-2.2)	2.0 (0.9-3.1)	0.7 (0.4-1.1)	3.0 (1.8-4.2)	0.8 (0.3-1.4)	0.3 (-0.1-0.8)	0.3 (-0.0-0.6)	2.2 (1.1-3.2)	1.6 (0.8-2.4)
Week 23	0.8 (0.3-1.3)	0.7 (-0.1-1.6)	0.9 (-0.2-2.0)	0.7 (0.4-1.1)	1.1 (-0.1-2.3)	0.7 (0.1-1.2)	0.6 (0.2-1.1)	0.4 (0.1-0.7)	0.7 (-0.4-1.7)	1.3 (0.5-2.1)
Week 24	1.0 (0.5-1.5)	1.7 (0.9-2.6)	0.9 (-0.2-2.0)	0.4 (0.1-0.8)	1.3 (0.1-2.5)	1.2 (0.6-1.8)	0.4 (0.0-0.9)	0.4 (0.1-0.7)	0.8 (-0.2-1.9)	1.7 (0.9-2.5)
Week 25	0.9 (0.4-1.3)	1.0 (0.2-1.8)	0.9 (-0.1-2.0)	0.7 (0.4-1.1)	1.3 (0.1-2.5)	0.8 (0.3-1.4)	0.5 (0.1-1.0)	0.7 (0.4-1.1)	0.6 (-0.4-1.7)	1.2 (0.4-2.0)
Week 26	1.5 (1.0-1.9)	1.8 (1.0-2.7)	1.9 (0.8-2.9)	0.7 (0.4-1.0)	2.2 (1.0-3.4)	0.9 (0.3-1.5)	1.3 (0.9-1.7)	0.4 (0.0-0.7)	1.1 (0.1-2.2)	2.8 (2.0-3.6)
Week 27	0.8 (0.3-1.2)	0.8 (-0.0-1.6)	0.8 (-0.2-1.9)	0.7 (0.4-1.0)	1.0 (-0.2-2.2)	0.7 (0.1-1.3)	0.6 (0.2-1.1)	0.4 (0.1-0.7)	0.8 (-0.3-1.8)	1.1 (0.3-1.9)
Week 28	1.2 (0.8-1.7)	2.3 (1.5-3.1)	0.9 (-0.2-1.9)	0.6 (0.3-0.9)	1.9 (0.7-3.1)	1.4 (0.8-2.0)	0.4 (-0.1-0.8)	0.6 (0.2-0.9)	0.8 (-0.2-1.9)	2.2 (1.4-3.0)
Week 29	1.4 (0.9-1.8)	1.1 (0.2-1.9)	2.3 (1.2-3.3)	0.8 (0.5-1.1)	2.9 (1.7-4.1)	0.8 (0.2-1.3)	0.5 (0.1-1.0)	0.8 (0.5-1.1)	2.1 (1.0-3.1)	1.2 (0.4-2.0)
Week 30	1.1	1.9	0.8	0.6	2.0	0.9	0.4	0.3	0.7	2.1

(continued on next page)

Appendix Table 1 (continued)

	Terciles of COVID-19 cases per capita for all counties <sup>a</sup>				Terciles of percent non-white from ACS <sup>b</sup>			Terciles of age-adjusted fatal drug overdose rate <sup>c</sup>		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	All	Lowest	Second	Highest	Lowest	Second	Highest	Lowest	Second	Highest
Week 31	(0.6–1.5) 0.9	(1.1–2.8) 0.9	(–0.2–1.9) 0.9	(0.3–0.9) 0.8	(0.8–3.2) 1.2	(0.3–1.5) 0.9	(–0.0–0.9) 0.6	(–0.0–0.6) 0.6	(–0.3–1.8) 0.7	(1.3–2.9) 1.4
Week 32	(0.4–1.3) 1.0	(0.1–1.8) 1.3	(–0.2–2.0) 1.0	(0.5–1.1) 0.5	(–0.1–2.4) 1.9	(0.4–1.5) 0.7	(0.2–1.0) 0.3	(0.2–0.9) 0.4	(–0.4–1.7) 0.7	(0.6–2.2) 1.7
Week 33	(0.5–1.4) 1.0	(0.5–2.2) 0.9	(–0.0–2.1) 1.9	(0.2–0.8) 0.3	(0.7–3.1) 2.0	(0.1–1.2) 0.8	(–0.1–0.8) 0.3	(0.1–0.7) 0.4	(–0.4–1.7) 2.0	(0.9–2.5) 0.7
Week 34	(0.6–1.5) 1.1	(0.1–1.7) 1.3	(0.8–2.9) 1.2	(–0.0–0.6) 0.7	(0.8–3.2) 1.9	(0.2–1.4) 0.8	(–0.2–0.7) 0.7	(0.0–0.7) 0.3	(0.9–3.0) 0.6	(–0.1–1.5) 2.3
Week 35	(0.6–1.5) 0.8	(0.5–2.2) 0.9	(0.2–2.3) 0.9	(0.4–1.0) 0.8	(0.7–3.1) 1.2	(0.2–1.3) 0.7	(0.2–1.1) 0.6	(–0.0–0.6) 0.5	(–0.5–1.6) 0.7	(1.5–3.1) 1.3
Observations	794,059	242,366	272,106	279,587	255,356	271,886	266,817	253,371	264,951	275,737

<sup>a</sup> Terciles are based on number of COVID-19 cases on August 31st, 2020 per 10,000 population from USAFacts (<https://usafacts.org/issues/coronavirus/>).

<sup>b</sup> Based on share of U.S. county (percent) that is not white in the American Community Survey (<https://api.census.gov/data/2018/acs/acs5/profile/groups/DP05.html>).

<sup>c</sup> County-level age-adjusted fatal drug overdose rate is used to create each tercile and the underlying data are from Centers for Disease Control and Prevention data in 2018 (<https://data.cdc.gov/NCHS/NCHS-Drug-Poisoning-Mortality-by-County-United-Sta/rpvx-m2md>).

<sup>d</sup> In parentheses are 95% confidence intervals.

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