

The sustained impact of COVID-19 on opioid dispensing in California

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Background

During the COVID-19 pandemic, healthcare access had dramatic changes that potentially impacted high-risk opioid prescribing among healthcare providers and high-risk opioid seeking behaviors among opioid recipients.

Objectives

This study aimed to determine the instantaneous and prolonged impact of COVID-19 on high-risk opioid prescribing behaviors to identify their future trends after COVID-19.

Methods

Design: The study utilized a retrospective longitudinal design that included Californian opioid recipients aged ≥ 18 with at least one opioid prescription from January 18, 2019, to December 17, 2021. The data was de-identified, and both participants and investigators were blinded.

Setting: The Controlled Substance Utilization Review and Evaluation System (CURES) is California's prescription drug monitoring program (PDMP). It is a database that collects and tracks information on controlled substance prescriptions dispensed by pharmacies and healthcare providers in the state of California.

Participants: The participants were 18-100 years of California residents and had at least one oral opioid prescription during the study period.

Statistical Analyses: One-sample test for proportions, two-sample t-test, two-sample test for proportions, and Fisher's exact test were adopted to test the difference in the sample numbers, average ages, and genders before and after the pandemic. To analyze the impacts of the pandemic, we implemented interrupted time series analysis with a segmented regression model to estimate. All analyses used Stata/SE 17 (StataCorp LP, College Station, TX), R 3.5, Python 3.8, and MATLAB R2022a (The MathWorks, Inc.).

Results

The study consisted of 3,611,946 California residents (mean [SD] age, 56.4 [14.5] years; 2,008,241 women [55.6%]), who were 18 to 100 years old with at least one record of oral opioid prescription record in the CURES database between January 18, 2019, and December 18, 2021. A total of 7,000,150 observations from 1,737,984 opioid recipients were evaluated in the pre-pandemic period, and 8,972,290 observations from 1,873,962 recipients were evaluated in the post-pandemic period (shown in Table 1). The segmented regression analysis (Shown in Figure 1) reveals that: COVID-19 has a negative immediate impact on high-risk indicators of multiple provider episodes (P-value=0.0125) and high standardized dosage of opioid prescriptions (P-value=0.0312), and has a significantly sustained effect (P-values ≤ 0.05) on all four indicators.

Table 1 Summary statistics of demographic data and baseline characteristics.

	Pre-pandemic (14 months)	Post-pandemic (21 months)	P-value
Total number of opioid recipients	1,737,984	1,873,962	<0.001
Total number of dispensing recorders	7,000,150	8,972,290	<0.001
Total number of prescribers	107,014	111,720	<0.001
Average monthly standardized dosage of opioid per recipient	849.31	814.26	<0.001
Male (n, %)	734,415	801,506	<0.001
Age (median, mean, std)	62, 61.26, 14.46	63, 62.1, 14.18	<0.001
Female (n, %)	1,007,074	1,076,770	<0.001
Age (median, mean, std)	63, 62.27, 15.53	64, 63, 15.17	<0.001
The number of recipients who have a high risk prescribing indicator			
(1) Multiple provider episodes (n, %)	401,417 (23.1%)	451,904 (24.11%)	<0.001
(2) Overlapping opioid prescription for ≥ 7 days (n, %)	140,301 (8.07%)	146,376 (7.81%)	<0.001
(3) Overlapping opioid and benzodiazepine for ≥ 7 days (n, %)	151,115 (8.69%)	151,701 (8.1%)	<0.001
(4) High standardized dosage of opioid prescriptions (n, %)	43,960 (2.53%)	30,932 (1.65%)	<0.001

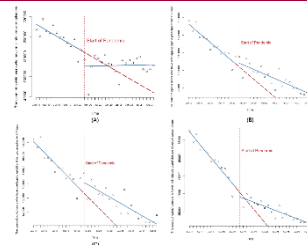


Figure 1 Segmented regressions and their counterfactuals. The vertical red dashed line indicates the time of the pandemic starting. The red dashed line followed blue line represents the counterfactual.

Conclusions

The study indicates that COVID-19 has had both an immediate impact on high-risk opioid prescribing behaviors, as well as a long-term influence on their trend. While there was a notable decrease in high-risk opioid prescriptions before the pandemic, the current situation suggests that the pandemic may impede further progress.

Limitation

Despite its good representativeness and inclusiveness of California residents, the CURES data, originally collected to monitor the controlled substance dispensing and promote a legitimate medical practice, failed to capture the opioids the patients obtained out of California.

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