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Effect of State Policy Changes in Florida on Opioid-Related Overdoses

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Abstract

Introduction: With a rapid increase in prescription opioid overdose deaths and a proliferation of pain clinics in the mid-2000s, Florida emerged as an epicenter of the opioid overdose epidemic. In response, Florida implemented pain clinic laws and operationalized its Prescription Drug Monitoring Program. This study examines the effect of these policies on rates of inpatient stays and emergency department visits for opioid-related overdoses.

Methods: Using data from the 2008–2015 State Emergency Department Databases and State Inpatient Databases, quarterly rates of inpatient stays and emergency department visits for prescription opioid-related overdoses and heroin-related overdoses were computed. A comparative interrupted time series analysis examined the effect of these policies on opioid overdose rates. North Carolina served as a control state because it did not implement similar policies during the study period. The data were analyzed in 2019.

Results: Compared with North Carolina, Florida's polices were associated with reductions in the rates of prescription opioid-related overdose inpatient stays and emergency department visits, a level reduction of 2.31 per 100,000 and a reduction in the trend of 0.16 per 100,000 population each quarter. The policies were associated with a reduction of 13,532 inpatient stays and emergency department visits for prescription opioid-related overdoses during the study period. No statistically significant association was found between the policies and heroin-related overdose inpatient stays and emergency department visits.

Conclusions: To address the opioid overdose epidemic, states have implemented policies such as Prescription Drug Monitoring Programs and pain clinic laws designed to reduce inappropriate opioid prescribing. Such laws may be effective in reducing prescription opioid-related overdoses.

INTRODUCTION

Prescription opioids are often prescribed for pain but can also present serious risks, including overdose and opioid use disorder.[1] From 1999 to 2017, nearly 218,000 people died from overdoses related to prescription opioids in the U.S.[2] In the mid-2000s, Florida emerged as an epicenter of the prescription opioid epidemic. From 2002 to 2009, prescription drug overdose deaths in Florida increased 84%, including a 265% increase

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in the death rate from oxycodone.[3] In 2010, among the top 100 physicians nationally dispensing oxycodone directly from their offices/pain clinics, 98 were in Florida.[4] As a response to the rapid increase in prescription drug overdose deaths and proliferation of pain clinics, Florida implemented pain clinic laws restricting the ability of prescribers to dispense opioids at the site of care. Pain clinics were initially required to register with the state by January 2010 with further expansions occurring throughout 2010. By July 2011, the law became fully operational with the state legislature prohibiting physicians from dispensing Schedule II or III drugs from their offices.[4] In addition, dispenser reporting to the newly established Prescription Drug Monitoring Program (PDMP) began in September 2011. The PDMP allowed providers to view the patient prescription history to identify and address problematic use of opioids.[5]

Evidence suggests, in Florida and elsewhere, that pain clinic laws and PDMPs are associated with reductions in overall and inappropriate opioid prescribing and opioid-related overdose deaths.[6–8] However, little is known about how these policies influence inpatient stays and emergency departmnent (ED) vists for prescription opioid-related overdoses. In addition, some have argued that opioid-prescribing policies could unintentionally increase the demand for illicit drugs, such as heroin.[9] This study examines the effect of Florida's pain clinic laws and PDMP implementation on rates of inpatient stays and ED visits for both prescription opioid overdoses and heroin overdoses.

METHODS

Data were from the 2008−2015 Healthcare Cost and Utilization Project state ED databases and state inpatient databases. The State ED Database contains a 100% sample of de-identified ED visits to nonfederal, short-term, general, and specialty hospitals that do not result in an inpatient admission. The State Inpatient Database contains the universe of the de-identified inpatient discharges, including stays that started in the ED. The quarterly rates of inpatient stays and ED visits were computed for prescription opioid-related visits and heroin-related visits. Opioid-related inpatient stays and ED visits were identified using the ICD-9-CM. Prescription opioid-related overdoses were identified using 965.00, 965.02, 965.09, E850.1, and E850.2; heroin-related overdoses were identified using 965.01 and E850.0. These codes have been shown to have a high predictive power and have been validated for their use in monitoring opioid overdose rates and evaluating interventions to reduce overdose.[10] Overdoses involving both prescription opioids and heroin (0.6% of overdoses) were excluded from the analysis.

The study period was divided into two segments: preimplementation (January 2008 to September 2011) and postimplementation (October 2011 to September 2015). Data beyond the third quarter of 2015 were not analyzed given the transition to ICD-10-CM. A comparative interrupted time series analysis was applied. North Carolina served as a control state because it did not implement PDMP, pain clinic law, or other major statewide opioid prescribing policy during the study period, and its data were available. Prais–Winston regression with a Cochrane–Orcutt transformation and robust standard errors were used to adjust for first-order serial autocorrelation. The reduction in inpatient stays and ED visits associated with the Florida policies was estimated by calculating the differences in the rate

of opioid-related overdose inpatient stays and ED visits assuming that the trends in Florida remained unchanged (the counterfactual). Analyses were performed using Stata, version 14.2. Data were analyzed in 2019.

RESULTS

Figure 1 shows trends in observed and predicted rates of opioid-related overdose inpatient stays and ED visits for Florida and North Carolina from 2008 to 2015. Quarterly rates of prescription opioid-related overdose inpatient stays and ED visits increased in Florida during the preintervention period by an average of 0.17 per 100,000 each quarter. However, during the postintervention period, rates decreased an average of 0.04 per 100,000 each quarter. Comparatively, the rates of prescription opioid-related inpatient stays and ED visits in North Carolina continued increasing during the same time period.

Compared with North Carolina, Florida's polices were associated with reductions in the rates of prescription opioid-related overdose inpatient stays and ED visits, a level of reduction of 2.31 per 100,000 (p=0.001) and a reduction in the trend of 0.16 per 100,000 (p=0.021) each quarter (Table 1). The policies in Florida were associated with an estimated reduction of 13,532 inpatient stays and ED visits for prescription opioid-related overdoses from October 2011 to September 2015. Both states experienced increases in heroin-related overdose inpatient stays and ED visit rates in the postintervention period. There was no statistically significant association between the Florida policies and heroin-related overdose inpatient stays and ED visits.

DISCUSSION

Florida's PDMP and pain clinic laws were associated with decreases in prescription opioid-related overdose inpatient stays and ED visits with no observed effect on heroin-related overdose inpatient stays and ED visits during the study period. These findings are consistent with previous research demonstrating a reduction in opioid-prescribing and opioid-related overdose deaths associated with pain clinic laws and PDMPs.[2–4] Pain clinic laws and PDMPs may prevent opioid overdoses by reducing access to harmful amounts of opioids among patients at risk for overdose.

Although this study is unable to determine if the observed effects were owing to the pain clinic laws versus PDMP implementation, the PDMP literature indicates that the impact of a PDMP policy is driven by its strength and robustness.[6,7,11–13] Mandated use PDMP policies have been shown to reduce opioid prescribing and overdoses,[11–13] whereas mere implementation without such requirements have limited effects.[14] Thus, given that the PDMP policy in Florida only included implementation, it is likely that the effects found in this study are largely because of the pain clinic law.

Limitations

This analysis has limitations. First, because Florida's pain clinic laws and PDMP were implemented at the same time, the analysis is unable to determine which policy was associated with the reduction in prescription opioid-related overdoses. Second, the analysis

did not account for other local and national interventions that might have affected opioid use and overdose rates differently in Florida and North Carolina. Third, data beyond the third quarter of 2015 were not analyzed given the transition to ICD-10-CM. Lastly, overdoses related to illicit synthetic opioids cannot be separated from those resulting from prescription opioids. For example, overdoses attributable to prescription fentanyl cannot be distinguished from those attributable to illicitly manufactured fentanyl. Thus, increases in overdoses attributable to illicitly manufactured fentanyl would result in underestimating the effect of the policies on prescription opioid overdoses.

CONCLUSIONS

To address the opioid overdose epidemic, states have implemented policies to reduce inappropriate opioid prescribing. An important component of these efforts is studies that empirically test their impact, whether intended or unintended. These results add to the evidence base demonstrating that Florida's PDMP and pain clinic laws were associated with decreases in prescription opioid-related overdose inpatient stays and ED visits. Additionally, the findings do not indicate that these polices were associated with further increases in heroin overdoses beyond the underlying secular trend.

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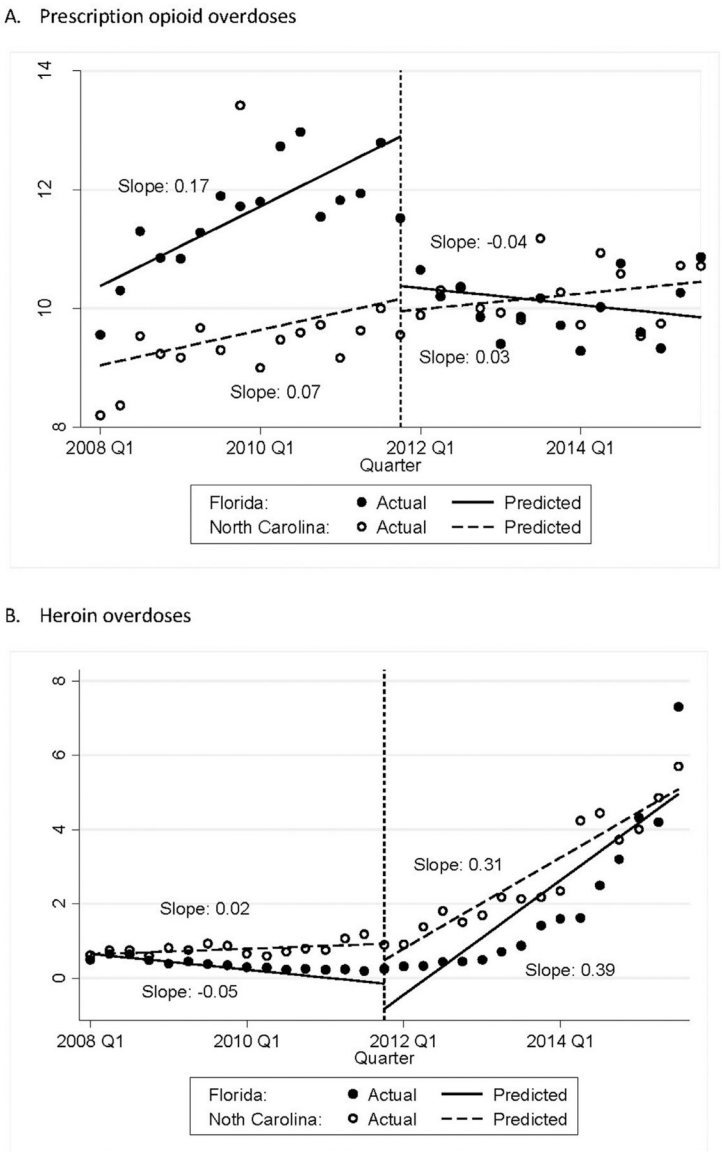

Figure 1.

Opioid-related overdose visit rates per 100,000 individuals before and after the implementation of a prescription drug monitoring program and pain clinic laws in Florida. Q, quarter.

Table 1.

Estimated Change in Opioid-Related Stays and Visits per 100,000 Associated With Policy Changes in Florida[a]

	Change associated with efforts in Florida				
Overdose type	**Level change[b] (95% CI)**	***p*-value**	**Change in slope[c] (95% CI)**	***p*-value**	**Estimated reduction in stays and visits from October 2011 to September 2015 (95% CI)**
Prescription opioid	−2.31 (−3.58, −1.04)	**0.001**	−0.16 (−0.30, −0.03)	**0.021**	13,532 (8,223, 18,842)
Heroin	−0.26 (−1.78,1.28)	0.736	0.15 (−0.08, 0.38)	0.191	*d*

Note: Boldface indicates statistical significance ($p<0.05$).

[a]The preimplementation period was January 2008 to September 2011. The postimplementation period was October 2011 to September 2015.

[b]Level change represents the intercept, a one-quarter increase or decrease at October 2011 distinct from ongoing trends.

[c]Slope represents the change in rate per quarter after implementation.

[d]This value was not calculated because no statistically significant association was found between efforts in Florida and nonfatal heroin overdose visit rates.

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