Drug and Alcohol Dependence 189 (2018) 37–41

Contents lists available at ScienceDirect

Drug and Alcohol Dependence

journal homepage: www.elsevier.com/locate/drugalcdep

Full length article

State naloxone access laws are associated with an increase in the number of naloxone prescriptions dispensed in retail pharmacies

Jing Xu[a], Corey S. Davis[b,*], Marisa Cruz[c], Peter Lurie[d]

[a] US Food and Drug Administration, 10903 New Hampshire Ave, Silver Spring, MD, 20993, USA
[b] Network for Public Health Law, 3701 Wilshire Blvd. #750, Los Angeles, CA, 90010, USA
[c] US Food and Drug Administration, 10903 New Hampshire Avenue, Silver Spring, MD, 20993, USA
[d] Center for Science in the Public Interest, 1220 L St. N.W., Suite 300, Washington, DC, 20005, USA

ARTICLE INFO

Keywords:
Naloxone
Opioids
Overdose
Law
Public health

ABSTRACT

Background: In response to the ongoing opioid overdose epidemic, many states have enacted laws increasing naloxone access by lay people, such as friends and family members of people who use drugs (PWUD), as well as PWUD themselves.

Method: We utilized Symphony Health Solutions' PHAST Prescription data from 2007 to 2016 to investigate whether naloxone access laws were associated with an increase in naloxone dispensed from retail pharmacies in the United States.

Result: Using a negative binomial regression, we found that naloxone access laws were associated with an average increase of 78 prescriptions dispensed per state per quarter. This represents an average 79% increase in naloxone dispensed from U.S. retail pharmacies, compared with states where there were no such laws.

Conclusion: Our study suggests that naloxone access laws can increase the availability and accessibility of naloxone.

1. Introduction

The opioid epidemic was recently declared a national public health emergency (The White House, 2017). According to the Centers for Disease Control and Prevention (CDC), the number of overdose deaths involving opioids quadrupled between 1999 and 2015, and drug overdose death is now the leading cause of death among Americans under 50 years of age (Centers for Disease Control and Prevention, 2016). While prescription opioids have driven much of this increase in opioid overdoses, overdose deaths from illicit opioids such as heroin and illicitly produced fentanyl analogs have risen sharply in recent years (Centers for Disease Control Prevention, 2015; Green and Gilbert, 2016). Many of these opioid overdose deaths could potentially have been avoided if persons experiencing an overdose had received naloxone, a safe and non-addictive opioid receptor antagonist which has been long used in clinical settings to reverse both prescription and illicit opioid overdoses (Ashton and Hassan, 2006; Beletsky et al., 2012; Chamberlain and Klein, 1994; McClellan et al., 2018).

Because the probability of irreversible opioid-related harm, including overdose-related death, increases with the amount of time a person remains in opioid-induced respiratory depression, it is imperative that naloxone be immediately available at the scene of the overdose (Michiels, 2004). Until quite recently, laws and regulations that were passed prior to the current opioid overdose epidemic made it difficult for many individuals to access naloxone, decreasing the probability that it would be present and able to be quickly administered at the scene of an overdose (Davis et al., 2013; Davis and Carr, 2015).

In recent years, however, many states have enacted naloxone access laws or modified existing legal frameworks to increase access to the medication in both the pharmacy and non-pharmacy context (Davis and Carr, 2017). These laws vary from state to state, but all contain provisions intended to increase access to naloxone in the non-clinical setting (Davis and Carr, 2015). While community-based naloxone programs have seen rapid scale-up over the past decade, little is known about changes in the dispensing of naloxone through retail pharmacies, particularly since the recent passage of many naloxone access laws (Jones et al., 2016; Wheeler et al., 2015),

Our study examined the overall effect of these naloxone laws on pharmacy naloxone dispensing, as well as separately examining the effect of two discrete provisions present in many of these laws. Specifically, we examine third-party prescribing provisions, which permit an authorized healthcare provider to prescribe naloxone to any individual potentially positioned to assist a person experiencing an overdose, whether or not the individual at risk is a patient of the

* Corresponding author at: Network for Public Health Law, 3701 Wilshire Blvd. #750, Los Angeles, CA, 90010, USA.
E-mail addresses: Jing.Xu@fda.hhs.gov (J. Xu), cdavis@networkforphl.org (C.S. Davis), Marisa.Cruz@fda.hhs.gov (M. Cruz), plurie@cspinet.org (P. Lurie).

https://doi.org/10.1016/j.drugalcdep.2018.04.020
Received 2 January 2018; Received in revised form 20 April 2018; Accepted 22 April 2018
Available online 29 May 2018
0376-8716/

prescriber. These laws typically authorize naloxone prescriptions to family members or friends of an individual with an opioid use disorder, as well as any person who may be in a position to assist in an overdose. We also examine the effect of legal provisions that permit naloxone to be dispensed via standing order. These provisions broaden the reach of third-party prescribing by permitting pharmacists to dispense naloxone to any person who meets criteria specified in the order, without that person needing to obtain a traditional prescription for the medication.

No prior study, to our knowledge, has investigated the impact of naloxone access laws on naloxone dispensing in the U.S. retail pharmacy setting. For that reason, we examined whether the presence of state-level naloxone laws, as well as third party and standing order previsions, are associated with changes in dispensed prescriptions for naloxone in outpatient retail pharmacies over time.

2. Materials and methods

2.1. Naloxone dispensed in outpatient retail settings

Symphony Health's PHAST Prescription Monthly database was used to provide nationally projected dispensed prescriptions in outpatient retail settings. The dataset is a syndicated view of U.S. retail and mail order pharmacy prescription activity, updated monthly (Symphony Health, 2017). PHAST Prescription Monthly covers over 54,000 retail pharmacies, including specialty pharmacies. This represents approximately 90% of all U.S. retail prescriptions and includes cash, Medicaid, and commercial insurance payments. The dataset includes therapeutic class and product, payment type, prescriber specialty, manufacturer, patient age/gender, and geographic area.

We extracted the 2007–2016 retail data on dispensed naloxone prescription at the state and quarterly level. We report the annual number of retail naloxone prescriptions dispensed stratified by patient age, medication marketing status (branded/generics), payer type, and prescriber's medical specialty.

2.2. Naloxone access laws

States with naloxone laws containing either standing order or third-party provisions enacted as of June 1, 2016, were first extracted from the Prescription Drug Abuse Policy System, (PDAPS) (Prescription Drug Abuse Policy System, 2017) website. We independently reviewed state naloxone laws and used Lexis Advance and state legislative websites to confirm the presence, type, and effective date of naloxone access laws for all states (see Appendix). Discrepancies were minor and were resolved by research team consensus. For analysis, the date for each naloxone access law was defined as the first day of the first quarter following the actual effective date. Naloxone access laws were evaluated as 1) separate dichotomous variables for each provision of the naloxone access law (standing order and third-party); and 2) a composite indicator, coded as present if the state had a law with either type of provision and zero if had neither. Every state was coded as such for each quarter.

2.3. Opioid overdose deaths

Because state legislative efforts and prescriber behaviors may in part reflect state-specific variation in the underlying severity of the opioid epidemic; state-level prescribing data for each year were adjusted for the state-specific numbers of opioid overdoses from the preceding year. We obtained opioid overdose death information for 2005 to 2015 from the CDC WONDER dataset, which collects information from death certificates filed in 50 states and the District of Columbia (Centers for Disease Control Prevention, 2017). In accordance with prior CDC publications (Rudd, 2016; Rudd et al., 2016), we identified the total opioid overdose deaths using ICD-10 cause-of-death codes of T40.1 for Heroin; T40.2, T40.3, and T40.4 for prescription opioids; and T40.6 for unspecified narcotics.

2.4. Buprenorphine prescriptions

Patients on medication-assisted treatment (MAT) for opioid use disorder (OUD) have been shown to be less likely to experience opioid overdoses (Schwartz et al., 2013; Volkow et al., 2014). Our model controlled for the use of MAT using only buprenorphine data, as the typical clinic-based dispensation of methadone for MAT is not captured in retail pharmacy data, and we found only minimal naltrexone prescribing during our study period. Due to buprenorphine's outpatient usability, it has significantly enhanced access to OUD treatment (Dick et al., 2015; Substance Abuse and Mental Health Services Administration, 2017). In 2016, access to buprenorphine further increased when the per-physician limit on the number of patients allowed to receive it was raised (Substance Abuse and Mental Health Services Administration, 2016). We identified MAT-specific buprenorphine prescriptions using codes for specific antagonists from PHAST Prescription Monthly data.

2.5. Models

We utilized temporal and geographic variations in the passage of naloxone access laws and changes in their provisions to assess their impact on state-level naloxone pharmacy dispensing on a quarterly basis. Particularly in the early years of this study, the number of dispensed naloxone prescriptions in a state in a given quarter was often zero. These characteristics render a count data model appropriate for the regression analysis. We chose the Negative Binomial estimator over the Poisson model as the variance of our outcome variables is larger than its mean (Long, 1997). Our model includes relevant state population as a covariate to normalize for exposure. We recognize that states have been taking various strategies to expand access to take-home naloxone. As a result, some of the difference in dispensing naloxone might be due to other programs or policies not related to naloxone access laws. We also controlled for state-specific linear trends in our model to help account for state-level factors varying over time that affect both the enactment of naloxone access laws and naloxone prescribing. These interactions of each state dummy variable with a time trend will help pick up increasing or decreasing trends in dispensing naloxone in each state that might be correlated with naloxone policies.

State-fixed effects and year-fixed effects are included to capture any time-invariant state or secular trends in the distribution of naloxone.

3. Results

3.1. State naloxone access laws

The first naloxone law with a third-party naloxone prescribing provision and the first law with a naloxone-related standing order provision became effective in 2001 and 2010, respectively. The number of states with standing orders or third-party prescribing provisions increased dramatically between 2010 and 2016 (Fig. 1). As of 2016, 47 out of 50 states and the District of Columbia (92%) had either standing orders or third-party prescribing provisions; one state (Minnesota) had only a standing order provision, six states (Connecticut, Idaho, Michigan, Nebraska, Oklahoma, and Oregon) only had third-party prescribing provisions, 40 states had both, and four states (District of Columbia, Kansas, Montana, and Wyoming) had neither.

3.2. Characteristics of naloxone recipients

The overall number of dispensed naloxone prescriptions increased dramatically during the study period, starting from 1488 in 2007 and ending with 147,457 in 2016 (Fig. 2). The per-state average numbers of dispensed prescriptions in 2016 for the states with 1) only a standing