Estimating the impact of prescriber arrest on county-level opioid analgesic supply: New York City and Long Island, New York, 2011-2018

Bennett Allen, Center for Opioid Epidemiology and Policy, Department of Population Health, New York University Grossman School of Medicine

Ellen C. Caniglia, Center for Opioid Epidemiology and Policy, Department of Population Health, New York University Grossman School of Medicine

Victoria A. Jent, Center for Opioid Epidemiology and Policy, Department of Population Health, New York University Grossman School of Medicine

Magdalena Cerdá, Center for Opioid Epidemiology and Policy, Department of Population Health, New York University Grossman School of Medicine

Introduction

Prescriptions for opioid analgesics (OAs) increased substantially in the United States since 2000, and OA diversion has been linked to opioid overdose risk. Law enforcement actors have used criminal sanction of prescribers who facilitate diversion as a leading opioid response strategy. However, little empirical research has measured the impacts of prosecution as an opioid response. As public health/public safety partnerships expand nationally, rigorous assessment of both disciplines' interventions is necessary to inform collaborative practice.

Study Design and Methods

Interrupted time series and meta-analysis were used to estimate the impact of prescriber arrest on county-level opioid analgesic dispensation. Two data sources were used: retail pharmacy prescription dispensation data derived from IQVIA Xponent and prescriber arrest information derived from public prosecution announcements of the US Attorneys for the Eastern and Southern Districts of New York, which hold jurisdiction over the study area. Data covered the five counties comprising New York City (NYC) and two counties comprising Long Island, New York (LINY). Each prescriber arrest event was considered an individual county-level exposure.

We treated each arrest event as an individual study using OA dispensation data from the county in which the arrested prescriber's practice was located. The six-month period before the arrest was categorized as unexposed time and the six-month period after the arrest was categorized as exposed time. We examined four OA prescribing outcomes for each event: overall OA dispensed prescriptions, high-dose OA dispensed prescriptions, OA dispensed prescriptions paid with cash, and concurrent OA and benzodiazepine dispensed prescriptions.

Interrupted time series were modeled separately for each arrest event and for each outcome using negative binomial segmented regression. Models used Newey-West heteroskedasticity and autocorrelation consistent covariance estimators to adjust for potential autocorrelation. A six-

month time window was utilized on either end of each arrest event to six months to avoid event overlap within counties. Coefficients for associations during the one- and six-month periods after arrest events were computed as incidence rate ratios for each model.

We used meta-analysis to generate an overall estimate of the association between prescriber arrests and each outcome for New York City and Long Island, treating each of the arrest events as individuals "studies." Random effects were used to allow for variation in the populations across counties within each jurisdiction. Meta-analyses obtained overall short- and long-term impacts of arrest for each of the four outcomes for New York City and Long Island. In a post-hoc sensitivity analysis, we conducted meta-analysis for events within New York City excluding an outlier event.

Challenges and Opportunities

A primary methodological area of concern was the identification of prescriber arrest events. Prosecutions of prescribers linked to OA diversion often are preceded by costly and lengthy investigations. As such, in New York City and Long Island, many of these prosecutions occur at the federal level. Given this, we identified prescriber arrests through the public arrest announcements made by the US Attorneys for the Southern and Eastern Districts. We excluded cases that indicated arrest due to patient death or drug-induced homicide. While our method of assessing the arrest exposures is likely to capture a majority of prescriber arrests in New York City and Long Island, it is probable that some events occurred at the state level and thus were not included in this analysis. Since most law enforcement interventions occur at the case level, in contrast to population-level public health interventions, care is required in the assessment of exposures.

Discussion Questions

- What are some important methodological considerations for public health researchers to successfully conduct empirical evaluations of case-level law enforcement interventions?
- What are some strategies for public health researchers to leverage administrative data to better understand the impacts of law enforcement interventions on population health outcomes?