The opioid epidemic: Data-driven case studies

KPMG Government Institute

Issue brief | November 2017

Drug overdoses accounted for over 52,000 American deaths in 2015, and with 2016 totals projected to top 60,000, the opioid epidemic may claim more American lives in a calendar year than the entire Vietnam War.[1] The current opioid epidemic is widely believed to have evolved from a period of overprescribing opioid pain relievers, with prescription trend increases beginning around the turn of the century before leveling off by 2012.[2] While state government legislative action has helped curb the availability of prescription opioids and reduce prescription-opioid-related deaths, the number of deaths related to illicit opioid abuse with drugs, such as heroin and fentanyl, has continued to skyrocket (see Figure 1).

Figure 1: Overdose Deaths Involving Opioids, United States, 2000–2015.[3]
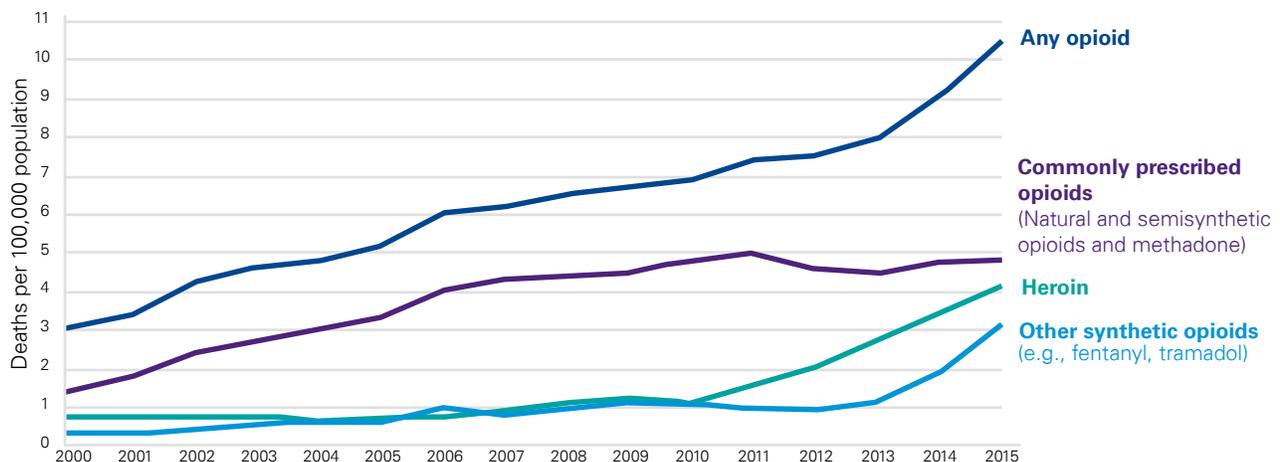
On March 29, 2017, President Trump issued Executive Order 13784 "Establishing the President's Commission on Combating Drug Addiction and the Opioid Crisis," highlighting the urgency to examine and amend funding vehicles, treatment programs, educational initiatives, and other key areas related to the opioid crisis. This was followed by President Trump announcing the opioid epidemic as a public health emergency on October 26, 2017. With the increased attention and potential funds flowing to combat the epidemic, states and local municipalities now have the opportunity to bolster ongoing efforts.

This issue brief explores a number of strategies that state and local municipalities have been deploying over the past years that may serve as examples to others. Despite the struggle to effectively combat the opioid epidemic, a number of efforts have yielded initial positive results and have uncovered promising strategies to attack the multifaceted epidemic through data-driven solutions.

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[1] Annual Surveillance Report Of Drug-Related Risks And Outcomes, Centers for Disease Control and Prevention, 2017.

[2] Longo, Dan L. "Nonmedical Prescription-Opioid Use and Heroin Use." *New England Journal of Medicine*, vol. 374, no. 13, 14 Jan. 2016.

[3] CDC/NCHS, National Vital Statistics System, Mortality. CDC WONDER, Atlanta, GA: US Department of Health and Human Services, CDC; 2016. https://wonder.cdc.gov/.

State and local governments ramping up PDMP efforts

Given the driving impact of overprescribing on the initial onset of the opioid crisis, 49 states and the District of Columbia have implemented prescription drug monitoring programs (PDMPs) that track both prescriber and patient prescription information. PDMPs are capable of both storing and disseminating prescription data to key stakeholders, thereby providing prescribers with the tools to help prevent overprescribing dangerous quantities of drugs, such as opioids, to patients. As of 2014, 22 of the 49 states with PDMPs have adopted at least some form of requirement for prescribers to check their state's PDMP before dispensing a new prescription of schedule II through V drugs to a patient.[4]

However, while most states have developed their own nuanced regulations dictating which stakeholders (judicial officials, law enforcement, regulatory boards, state Medicaid agencies) can obtain PDMP data under given circumstances, national cohesion regarding the proper distribution channels and access rights to PDMP data has yet to materialize. According to the National Alliance for Modern State Drug Laws, only six states allow PDMP access to either their state Department of Health or Commissioner of Public Safety.[5]

In addition, many states have found that prescription monitoring has only addressed a portion of the overall opioid epidemic given that many individuals with addiction problems have started turning to illegal opioid use, which is not tracked through the PDMPs. One such example is Florida, where both oxycodone prescriptions and oxycodone-related deaths fell quite dramatically (24 percent and 50 percent, respectively, between 2010 and 2012) after launching its PDMP and increasing regulations on pain clinics and the dispensing of prescription opioids.[6] Unfortunately, after initially being recognized by the CDC as a state success story, overdose deaths related to fentanyl and heroin increased rapidly after 2012, currently placing Florida firmly back in the throes of the opioid epidemic.

Taking it a step further – Initial data-driven success stories

While the PDMP efforts and associated legislations were a good start to addressing prescription behaviors, the shift in the factors that drive the epidemic has increased the need for more multipronged and sophisticated data solutions. In this section, we explore several examples of states that have stepped up efforts to track and solve the opioid epidemic through data-driven approaches. We start with the collaborative approaches undertaken in New England, where five of the six states that comprise the region are among the 13 hardest hit by overdose deaths. Next, we examine the positive effects that a predictive data analytics approach has had at the county level in Pennsylvania. Finally, we highlight the impacts of a nationally leading intensive data monitoring approach in Oklahoma, which has resulted in one of the sharpest reductions in opioid overdose deaths in America.

Figure 2: Graph depicting number of deaths in Florida related to opioid use. Source: Florida Medical Examiners Commission.
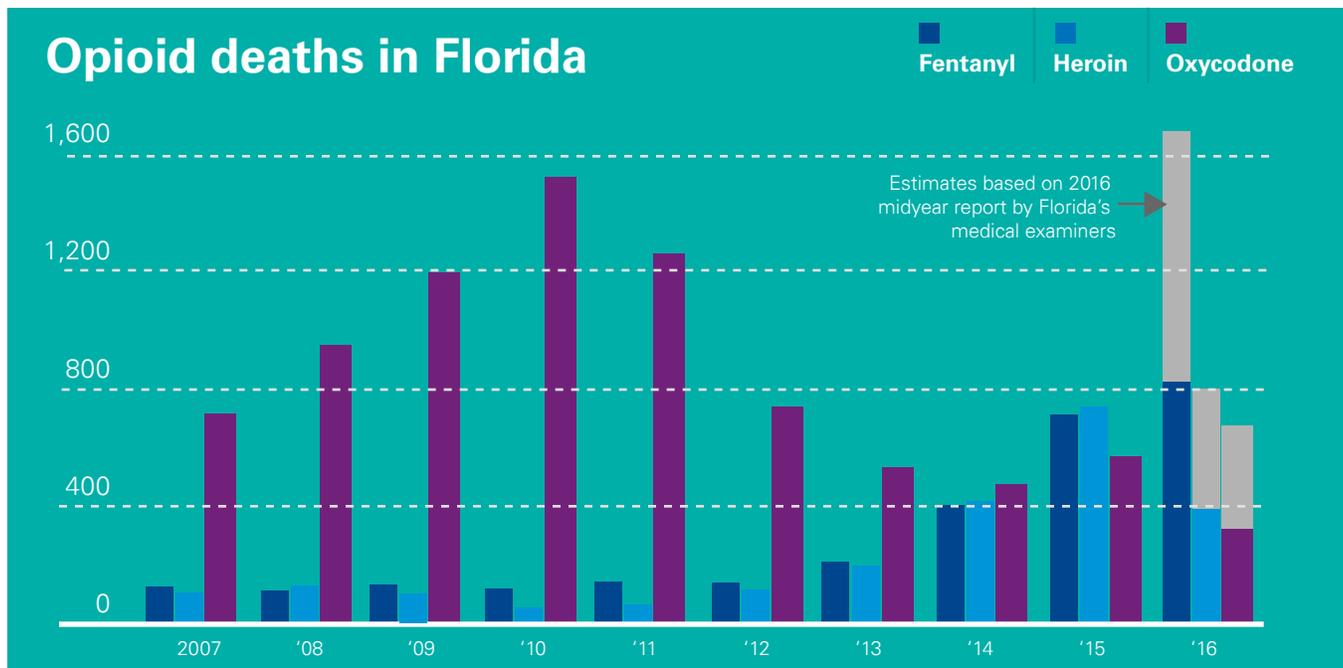
[4] States that Require Prescribers and/or Dispensers to Access PMP Database in Certain Circumstances, National Alliance for Model State Drug Laws, June 2014.

[5] Compilation of Prescription Monitoring Program Maps, National Alliance for Model State Drug Laws, May 2016.

[6] "Opioid Overdose", Centers for Disease Control and Prevention, August 24, 2017.

Rhode Island: Using data to drive a consistent strategic agenda

Rhode Island's data-driven strategy for combatting the opioid epidemic includes a strategic action plan that establishes quantifiable success criteria for assessing progress. Rhode Island used 2015 data for overdose deaths, emergency room visits, prescription totals, and other key statistics as a benchmark reference and set corresponding goals for each of these metrics to be achieved by 2018.[7] The Rhode Island Overdose Prevention and Intervention Task Force Action Plan tracks progress on the key metrics on a periodic basis, varying between monthly and annually depending on the metric. Key strengths of the action plan include a focus on a manageable set of metrics and tracking metrics across the full spectrum of opioid management, starting with prevention and tracking through rescue, treatment, and recovery.

Massachusetts: Focusing on data-driven collaboration

One of the key difficulties in managing the opioid epidemic is that the causes and symptoms fall across the jurisdiction of numerous state agencies, both medical and social. That means that data from a single agency will likely not allow for a comprehensive view across the epidemic. The Commonwealth of Massachusetts established the Chapter 55 report in August 2015, which aggregates information from 10 different data sets across five separate government agencies into an integrated report intended to guide policy and elucidate trends related to the opioid epidemic. Massachusetts hopes to spur collaboration among public organizations and between the government and private sectors to promote a cooperative approach to addressing the opioid epidemic, with the integration of data sets and complex data analysis driving this approach. Among the key findings of the initial report was the staggering discovery that Massachusetts' incarcerated population is 56 times more likely to overdose upon their release from prison than the general population.[8] Such a statistical outlier certainly warrants further exploration, and Massachusetts' county sheriff and police departments have already begun to assume this mantle.

In another example of cross-agency data collaboration in the state, several of Massachusetts' Plymouth County police departments joined forces with one another and recovery experts in December 2015 to embark on an extensive outreach program that enlists officers to visit and connect with overdose victims within 24 hours of their release from the hospital. The program, named Project Outreach, has since expanded to include hospitals, addiction councilors, representatives from the court system, and other key stakeholders working to solve the opioid crisis.[9] Project Outreach augments community education and outreach services through the use of predictive data analytics, offering targeted treatment and recovery options to individuals who have experienced an overdose. Early metrics show promising signs for Plymouth County's fight against opioids, with total overdose deaths in 2017 on pace to reduce by roughly 50 percent compared to 2016 totals.

Pennsylvania: Using predictive data analytics

Feeling the exigent demand for targeted action, governments across the country are beginning to attack the opioid crisis at the local level. In Allegheny County, Pennsylvania, the local Department of Health and Human Services is targeting overdoses by neighborhood with the use of predictive data analytics. Allegheny officials have compiled a list of over 1,300 residents who died from an overdose of prescription opioids, heroin, and/or fentanyl from 2008 through 2014 and are cross-referencing that list with data from the healthcare and corrections systems to discover emerging patterns—trends which, if understood better, could help save lives.

Oklahoma: Adopting real-time PDMP reporting

Emerging as a national leader in data sharing capabilities, the State of Oklahoma became the first state in the country to adopt real-time reporting for its PDMP. The Oklahoma Prescription Monitoring Program (PMP) was enacted into law by the Oklahoma Anti-Drug Diversion Act. Designed to deter the abuse of prescription drugs, the statute requires all dispensers of Schedule II, III, IV, and V controlled substances to submit prescription dispensing information to the Oklahoma Bureau of Narcotics and Dangerous Drugs within five minutes of dispensing a scheduled narcotic. The PMP can be easily accessed by healthcare professionals, law enforcement agencies, state agencies, and health boards. As a result, death totals from overdoses dropped at the third-fastest pace in the nation between 2014 and 2015. Correspondingly, Oklahoma fell from 10th to 20th in per capita opioid-related deaths in the United States over just a one-year period, from 2014–2015.[10]

Final thoughts

The case studies presented in this issue brief demonstrate the potential impact of solutions that leverage data across industry and government agency lines to unite the myriad of stakeholders combatting the opioid epidemic. In the wake of a glut of illicit opioids such as heroin and fentanyl, stakeholders charged with curbing the opioid epidemic need to harness the latent potential of available data sets to uncover trends that lead to lasting prevention, recovery, and treatment solutions. Data sharing and predictive data analytics tools can help synthesize the available information for stakeholders into comprehensive analyses, which can lead to immediate and actionable solutions. Innovative, impactful, and lasting solutions can come from either the state or municipal level; however, these nascent success stories point to a collaborative approach as the foundation of a winning strategy.

[7] Raimondo, Gina M. Rhode Island Overdose Prevention and Intervention Task Force Action Plan. Governor's Overdose Prevention and Intervention Task Force, Spring 2016.
[8] "Chapter 55 Data Visualization." Opioid Epidemic, Massachusetts Department of Public Health, 2017.
[9] Plymouth county law and health officials work toward better program to help addicts. WFXT, July 18, 2017.
[10] "Opioid Overdose." Centers for Disease Control and Prevention, December 16, 2016.

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