



Paramedic/FTO Jordan Ehrlich

By Jeremiah M. Kinsman, MPH, EMT, Jeffrey M. Elder, MD, & Joseph M. Kanter, MD, MPH

# FIGHTING THE OPIOID CRISIS

## FROM THE FRONT LINES

How EMS can share data and partner with public health to help combat the overdose epidemic

**E**MS has been at the forefront of America's public health emergencies for more than 50 years. So when the Centers for Disease Control and Prevention (CDC) announced last January that drug overdoses are now the leading cause of injury-related mortality in the U.S., it was no surprise to the EMS community. EMS providers have directly witnessed the increase in the rate of drug overdose deaths—estimated at 137% over the last 15 years. Opioids—including prescription

painkillers, as well as illicit drugs like heroin—caused the majority of that increase.<sup>1</sup>

In 2014 EMS providers in the U.S. encountered more than 430,000 patients suspected of drug ingestion; they administered naloxone, a medication that reverses the effects of opioids and increases overdose patients' respiratory effort, more than 150,000 times.<sup>2</sup> Despite these efforts and those of the nation's public health and public safety agencies, the CDC estimates 28,647 Americans died from opioid overdoses in 2014, more than any

previous year on record.<sup>1</sup> Clearly more needs to be done to address this deadly problem.

Prehospital medical providers and their public safety partners save lives every day responding to these emergencies, but EMS can also help address the epidemic on the front end, hopefully preventing overdoses before they happen. The position of EMS on the front lines of the opioid overdose epidemic—combined with the standardization of EMS incident response records at the local, state and national levels—makes the information collected by EMS providers a valuable tool. Sharing this data with public health partners can help identify high-risk populations, conduct epidemiologic surveillance and pinpoint geographic hotspots for drug overdoses.

### A Local Problem

New Orleans knows the devastation caused by opioid abuse all too well. Orleans Parish, which includes New Orleans, saw a 508% increase in the rate of drug overdose deaths from 2004 to 2014. There were 110 drug overdose deaths in Orleans Parish in 2014.<sup>3</sup> As the rate of overdose deaths has increased, New Orleans Emergency Medical Services (NOEMS) has seen a parallel rise in EMS responses for drug overdoses and naloxone administrations. During 2015, NOEMS providers administered naloxone to 980 patients.

For the New Orleans Health Department (NOHD) and other local organizations, regular reports from NOEMS describing the state of the epidemic have been extremely valuable. The reports include information on the numbers of opioid-related cardiac arrests, naloxone administrations and EMS patients suspected of using opioids. NOEMS can also conduct near-real-time surveillance and analysis that can recognize when highly potent opioids are sold on the streets and when the number of overdose deaths increases in a matter of days or even hours. The combination of continuous near-real-time surveillance and regular reporting has been vital to Orleans Parish in combating the epidemic.

When NOEMS providers witnessed a sudden rise in the number of opioid overdose deaths in January 2016, EMS records confirmed a fivefold increase. Using incident addresses in the EMS records, NOEMS produced hotspot maps to detect areas where

high numbers of overdoses were occurring. These maps were shared with local public health organizations that provide education on substance abuse and addiction, allowing them to target certain sections of the city and efficiently use their resources. Outreach workers equipped with educational materials, resources on substance abuse treatment and expertise in teaching correct naloxone administration focused their efforts on the hardest-hit neighborhoods, thanks in part to the information found in EMS data.

In addition to helping find overdose hotspots, local EMS databases provide further advantages over other data sources. For the NOHD, NOEMS data is easier to access and more comprehensive than that of other sources. Information on overdoses from hospitals, coroners and public health databases can provide important information regarding the epidemic, but is difficult to access, requiring taxing linkage procedures, and necessitates additional resources for interpretation and analysis. EMS data can illustrate the whole picture of the epidemic occurring in the prehospital setting—capturing the patients who overdose and are not taken to the hospital as well as those taken to any local facility. Furthermore, NOEMS providers understand that patient care reports are a vital link between the field and a broader public health response, so they focus on ensuring precise data entry.

### The National Picture

In October 2015 the White House announced a major initiative to address prescription drug and heroin abuse. The National Highway Traffic Safety Administration's Office of Emergency Medical Services (NHTSA OEMS) has been helping coordinate the federal effort by supporting state and local EMS agencies and using EMS data to gain understanding of the crisis at the national level. The OEMS monitors the EMS response to the opioid overdose epidemic with information from the National EMS Database, which contains EMS records submitted by 49 U.S. states and territories—more than 25 million records per year (see NEMSIS sidebar).

The database has provided information on the frequencies of suspected drug overdose patients encountered by EMS and the administration of naloxone at the national

level. The information collected on patient care reports across the country also offers details on any aid provided prior to EMS arrival, EMS providers' patient assessment and care, and the patient disposition—whether the patient was transported, for example. This information is shared with the Office of National Drug Control Policy (ONDCP) and other federal agencies, which helps inform their understanding of the epidemic and the need for additional resources.

The CDC also provides robust and unique information on opioid overdose deaths, but mortality and hospital data generally take significantly longer to be finalized and available. Public health agencies at all levels often need more timely data when combating public health emergencies. In comparison to CDC mortality data, publicly accessible EMS records are added to the National EMS Database on a quarterly, monthly and even weekly basis, and while the data does not directly estimate the mortality rate of drug overdose deaths, the frequency of EMS encounters with suspected drug overdose patients and the rate of naloxone administrations provide a reliable proxy for assessing the state of the epidemic.

### EMS Data and Policy Decisions

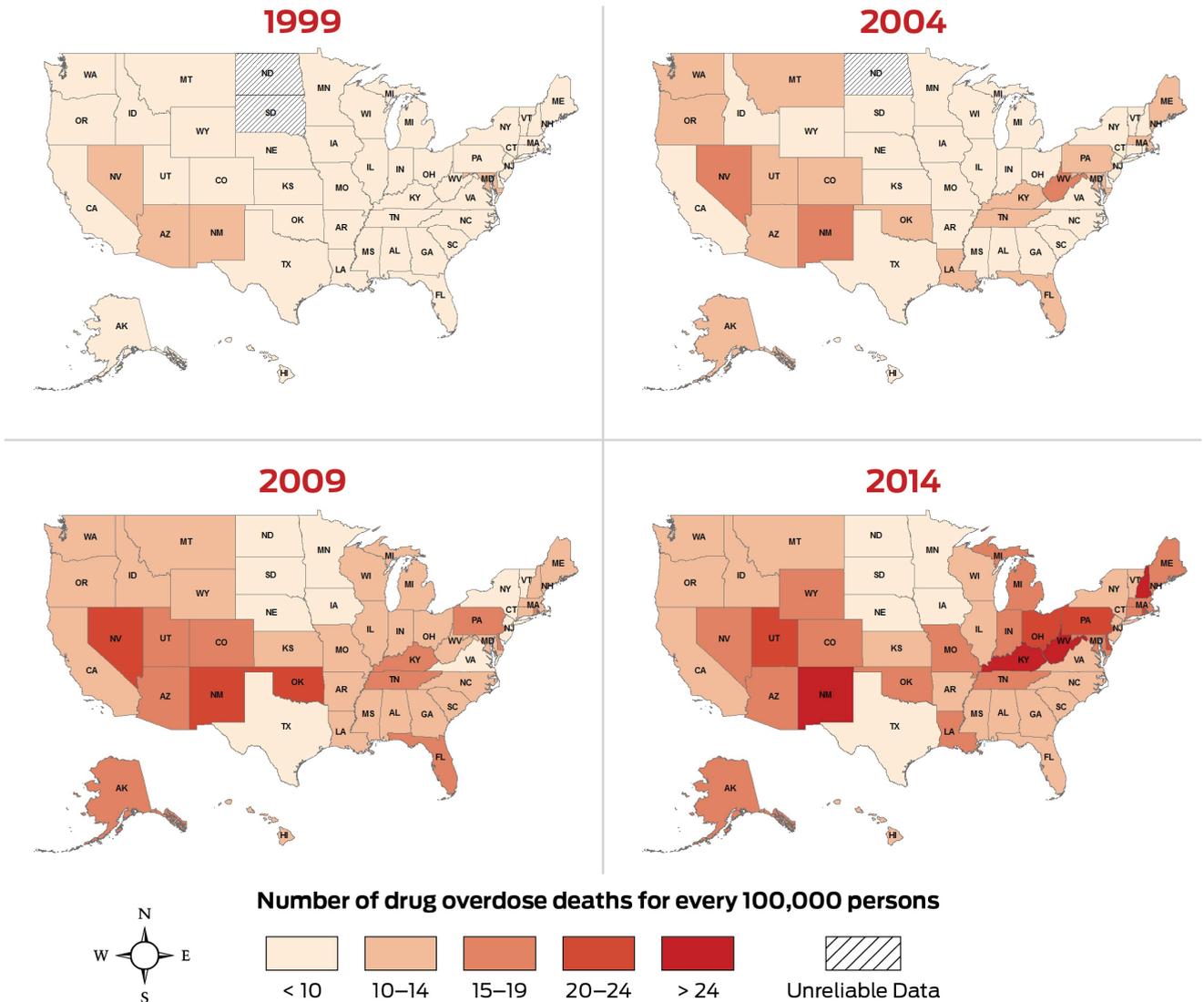
In addition to helping with day-to-day monitoring and response to the crisis, EMS data can be used for research that helps inform prehospital care and policy decisions at all levels.

NHTSA, the CDC and the Food and Drug Administration are collaborating on a number of opioid-related research projects that use data from the National EMS Database.

The CDC's National Center for Injury Prevention and Control is leading a study looking at trends in the number of patients requiring multiple naloxone administrations in the prehospital setting, which may indicate increasing opioid potency and inform adjustments to treatment protocols and dosing.

NHTSA's OEMS is looking at data to examine the effect of state changes to scopes of practice that authorized additional levels of EMS practitioners, such as EMTs and EMRs, to administer naloxone. The study will focus on the 15 states that made such changes in 2013 and 2014, and aims to see whether those changes correlated with any

# Drug Overdose Mortality Rates in the U.S.



Source: CDC WONDER, Underlying Cause of Death 1999-2014

The CDC estimates that 28,647 Americans died from opioid overdoses in 2014, more than any previous year on record.

change in how frequently naloxone was administered, blind-airway devices were used or CPR was performed on suspected drug overdose patients. The results will help inform changes to the National EMS Scope of Practice Model and may assist states that are considering allowing more providers to carry and administer naloxone.

In New Orleans public health officials turned to EMS data to help show lawmakers the extent of the crisis. The local health department used EMS data, which showed a fivefold increase in the number of opioid overdoses, to illustrate gaps in the

law that prevented physicians and public health agencies from directly distributing naloxone to lay people. The information was instrumental in establishing a standing order for naloxone distribution to lay persons at the University Medical Center outpatient pharmacy and in the efforts to pass Louisiana House Bill No. 1007, which authorized direct distribution of naloxone to lay persons without the need for a prescription throughout Louisiana.

EMS data will play a critical role in evaluating whether those policy changes and other public health interventions are

having an impact in New Orleans. Currently NOEMS identifies patients who were administered naloxone prior to EMS arrival through free text searches of provider narratives. However, efforts are underway to find additional methods for monitoring and evaluating the impact of lay person access to naloxone with the use of EMS data.

## Collaborative Efforts

Using and sharing CAD and PCR data is just one of many ways EMS can help fight the opioid overdose epidemic. EMS stakeholders of all sizes—including the federal

# Intervening in the ED

## EMS data can help spur further action after an overdose is reversed

Sharing EMS data to combat the opioid crisis makes sense, but extracting that data isn't as easy as just running a search for *overdose*. Those calls can be dispatched for other reasons (seizures, for instance, or a generic man down); medics can cite other chief complaints. So when you're culling your calls to find the ODs, how do you ensure none are missed? That's what Alex Garza wondered. And as medical director for 9-1-1 and EMS data experts FirstWatch, he had the means to find out.

Using data from one of the company's EMS clients, Garza, MD, MPH—assistant to the dean for strategic initiatives and chair of Environmental and Occupational Health at St. Louis University's College of Public Health and Social Justice—reviewed PCRs to find the overdoses, then examined things like their dispatch diagnoses and paramedics' impressions and chief complaints. He looked for patients who'd received naloxone. He searched reports for terms like *heroin*, *Vicodin*, *oxycodone*—anything that might relate to an opiate call. He looked for changes in GCS and respiratory rate that might indicate an overdose.

What emerged were two criteria that pinpointed the desired population pretty accurately:

- » Whether they'd gotten naloxone;
- » The free text search for related terms.

"The paramedic can put down any number of things underneath their impression or chief complaint," explains Garza, formerly chief medical officer for the Department of Homeland Security. "If an opiate overdose shows up as a respiratory arrest, they sometimes put down *respiratory arrest* as their primary complaint. If you merely queried opiate overdoses, you'd miss that. And the same holds true for dispatch; people can get dispatched on all sorts of things in regards to an opiate overdose."

### DOING SOMETHING

Mining opiate overdose cases from your patient data is terrific, but then what?

For data to be useful, you have to do something with it. "We're not going to solve the problem or make it better unless somebody is doing something with the data," notes Garza.

Some health systems are trying to intervene with revived patients in the emergency department. An emergency strategy is the "recovery coach," a non-ED employee trained to work with detoxing patients and help them get into longer-term treatment programs. There's evidence that using peers—coaches who are themselves recovering addicts—is especially effective.



Paramedic/FTO Jordan Ehrlich

**"I really believe EMS has the very best database for opiate overdoses of anybody in the medical spectrum."**

—Alex Garza, MD, MPH

They often have knowledge ED staff doesn't, like the bed space of local detox facilities or outpatient treatment programs that take Medicaid.

With the LifelineED program at Cooper University Hospital in Camden, NJ, a recovery coach or patient navigator will follow up with revived patients within 24 hours, then visit or call them weekly for eight weeks. That's a level of access hospitals can't match.

In Rhode Island a similar program, AnchorED, started in Providence in 2014, saw 230 survivors in its first year, 83% of whom engaged with recovery coaches and supports. Of those 230, only 12 (5%) returned to the ED multiple times.

Garza spoke to some of the sources behind such programs but found them leery of using EMS data to trigger interventions. "They were some interesting conversations," he says. "I really believe EMS has the very best database for opiate overdoses of anybody in the medical spectrum. If we can build a model to identify 98%, 99% of these patients, our data is very timely, and it's geocoded and has all of these other aspects unique to EMS. Conversely, emergency department data is often delayed and not geocoded. It's not as granular or as timely. So to make these sorts of really accurate and quick assessments is difficult to do with ED data."

Conversely, with EMS data, knowing the criteria that yield a high specificity, it's possible to construct triggers that can initiate a rapid response to revived users even while they're still in the ED.

Garza made the point at this year's Pinnacle conference, telling attendees they were sitting on untapped gold mines of data. "It's good data other people in the community can use," he says, "whether it's public health or addiction recovery specialists."

Better use of this data holds the potential even for pre-alerting EDs to incoming OD cases, like we do with STEMI and stroke, and identifying repeat offenders who may need intervention even more direly than other users.

There are several EMS systems across the U.S. making good use of their data to act against the opiate crisis. That's still primarily for identification, though, more than direct intervention.

"I think eventually we're going to come around to embracing this and becoming part of that treatment side as well," says Garza. "But it's going to take some time, because it takes sort of a cultural change. People often feel like, *Well, these are just the dregs of society*. But we're recognizing it's really a bigger problem—it's a disease pattern, so let's treat it that way." 🌟

—John Erich, Senior Editor

## The Role of NEMSIS

One reason EMS data is so valuable in the fight against opioid overdoses is the National EMS Information System (NEMSIS). NEMSIS was created to standardize how EMS data is collected in the field, stored and shared. This means data collected in New Orleans EMS patient care reports is in the same format as data collected by other agencies across Louisiana—and in almost all other states and territories. Having a uniform data standard puts EMS ahead of many of its partners in healthcare and public safety and allows EMS data to easily be aggregated and analyzed not only within one agency, but at regional, state and national levels.

EMS agencies and state offices are currently transitioning to version 3 of NEMSIS, which includes more descriptive data elements and permits even faster aggregation of information—allowing state and federal agencies to conduct near-real-time surveillance of public health emergencies such as the opioid overdose epidemic. Beginning on January 1, 2017, the National EMS Database will no longer accept records using previous versions of NEMSIS, making the transition to v3 critical to the nation's efforts to protect the public's health.

government, state regulators and local providers—are collaborating with public health and public safety partners in efforts that are not only leading to unique solutions to prevent overdoses but also cre-

patient. The results of the review, which is being conducted by researchers at Oregon Health & Science University, are expected to inform future evidence-based guidelines, protocols, curricula and training to help



### Local EMS databases can help find overdose hotspots.

ating relationships and partnerships that will lead to faster and better coordinated responses during future public health emergencies.

At the national level, five federal agencies (NHTSA, the CDC, the Centers for Medicare & Medicaid Services, the National Institute on Drug Abuse and the Agency for Healthcare Research and Quality) are working together to support a systematic review of the evidence pertaining to pre-hospital management of the opioid overdose

ensure overdose patients receive the most appropriate care in the field.

In Orleans Parish, collaboration between NOEMS, NOHD, the New Orleans Police Department, the New Orleans Office of Homeland Security and Emergency Preparedness, and other organizations has been especially beneficial. NOEMS has provided training resources and materials for assessing and treating overdose patients to the New Orleans Fire Department, NOHD and other public health agencies.

## Conclusion

Local and state agencies can use data to improve the response system and patient care, identify injury and disease common in the community, and ultimately solve real-world problems. EMS data has uses far beyond just quality improvement and billing; the information entered in PCRs and other records provides near-real-time intelligence to public health and public safety partners as well as researchers and policy-makers. That information can increase opportunities for referral to addiction services in the short term and lead to more successful treatments and interventions in the long term, ultimately saving lives.

Local EMS agencies can take advantage of the valuable data they collect every day, using it to initiate and improve collaboration with public health and public safety partners. Federal and local agencies have been successful in combating many of the nation's public health emergencies—as the opioid epidemic continues to harm communities across the country, EMS can play a role not only in responding to overdoses but in preventing them before they happen and ending the epidemic before more lives are lost. 🌟

## REFERENCES

1. Rudd RA, Aleshire N, Zibbell JE, Gladden RM. Increases in Drug and Opioid Overdose Deaths—United States, 2000–2014. *MMWR*, 2016 Jan; 64(50): 1,378–82; <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6450a3.htm>.
2. National EMS Information System, <http://www.nemsis.org/>.
3. CDC WONDER. Underlying Cause of Death 1999–2014, <http://wonder.cdc.gov/ucd-icd10.html>. Data are from the Multiple Cause of Death Files, 1999–2014, as compiled from data through the Vital Statistics Cooperative Program.

## ABOUT THE AUTHORS



**Jeremiah M. Kinsman**, MPH, EMT, is an Association of Schools and Programs of Public Health fellow in the NHTSA Office of EMS. He previously worked as an intern with the New Orleans Health Department while completing his Master of Public Health degree at the Tulane University School of Public Health and Tropical Medicine.



**Jeffrey M. Elder**, MD, is the director and medical director for New Orleans EMS. He also serves as the medical director for the New Orleans Fire Department and chief medical officer for the New Orleans Office of Homeland Security and Emergency Preparedness.



**Joseph M. Kanter**, MD, MPH, is the medical director of the New Orleans Health Department, as well as the Health Care for the Homeless Clinic. He is a practicing emergency physician at University Medical Center and clinical assistant professor of medicine at LSU Health Sciences Center.