MedicalXpress

Linking hospital and other records can predict both fatal and nonfatal opioid overdoses, study suggests

June 24 2020

Credit: CC0 Public Domain

A new study by researchers at the Johns Hopkins Bloomberg School of Public Health found that the odds of a fatal opioid overdose were 1.5

times higher for individuals with one to two visits to the emergency department for any medical issue than for people with no hospital visits. The researchers also found that individuals with a hospital visit where opioid use disorder was addressed were 2.9 times more likely to die from an overdose over the coming year, compared with other people.

For their analysis, the researchers matched de-identified individual records across five Maryland-based databases that encompassed hospital visits, prescription-drug monitoring, treatment programs, and criminal justice records from 2015. Maryland is one of the first states to have linked records across databases in an attempt to identify those at risk for opioid overdose.

The findings, published online June 24 in *JAMA Psychiatry*, suggest that risk of an overdose can be accurately predicted by leveraging information found across databases.

Using these linked databases, the researchers found that individuals who were recently released from prison were more than four times likely to experience a fatal overdose. Being on probation and parole were also associated with double the odds of an overdose.

Among demographic predictors of opioid overdose, men had 2.4 higher odds of fatal overdose and 1.4 times higher odds of nonfatal overdose compared to women.

"A lot of the individuals with the highest risk for an overdose come in contact with the hospital or prison system," says lead author Brendan Saloner, Ph.D., associate professor in the Department of Health Policy and Management at the Bloomberg School. "There's a high opportunity in those places to help those individuals and we can save a lot of lives if we focus efforts there."

Between 1999 and 2017, drug overdose deaths in the U.S. quadrupled and two out of three overdose deaths are linked to opioids. Initial reports suggest that during the COVID-19 lockdown period overdoses have dramatically increased in some locales.

Maryland and other states have applied several strategies to curb the opioid epidemic, including expanded treatment for people with opioid use disorder, safer prescribing policies, and harm reduction programs like naloxone distribution that can be administered to reverse an overdose.

The study findings suggest that predictive data analytics could be used to more effectively target these strategies towards those with the greatest risk by identifying groups that could most benefit from intensive support services such as peer counselors.

Maryland is among a handful of states that have built single comprehensive individual-level databases that include major risk factors that affect critical health outcomes, such as opioid overdoses. The merged database paints a far more complete picture than any one of the component parts, with a "lens" that combines medical, public health, and human service perspectives.

In collaboration with the Maryland Department of Health and the state's Health Information exchange, the researchers matched deidentified individual records across five Maryland databases including all-payer hospital discharge data, which includes private insurance as well as Medicare and Medicaid; Maryland's prescription drug-monitoring program, a registry of controlled prescriptions; behavioral treatment programs that participate in Medicaid; as well as criminal justice records for property or drug-related offenses.

The study sample of more than 2.29 million linked records, included

Maryland residents ages 18-80 with one or more records in any of the four databases in 2015. Using statistical modeling, the researchers predicted opioid-related overdoses in 2016 from variables derived from 2015. The researchers tracked fatal opioid overdoses using medical examiner records and nonfatal opioid overdoses from emergency department or inpatient hospital-settings data.

Of the study sample, approximately 43 percent were male and 53 percent were aged 50 or younger. In 2016, 0.05 percent of the sample, or approximately 1,204 individuals, experienced a fatal opioid overdose and 0.37 percent, or approximately 8,430 individuals, had a nonfatal overdose. In 2015, 63.9 percent of the study sample had hospital records, 32 percent had one to two emergency department visits, and 1.2 percent were diagnosed with an opioid use disorder in the hospital.

Approximately two-thirds of the sample (66.8 percent) had records in the prescription drug-monitoring program, but a very small number, only 1.1 percent, had involvement in the criminal justice system. The study drew on a limited criminal justice sample of only individuals with drug or property offenses. About 7.4 percent of the study sample had used behavioral health services.

"The COVID-19 experience has taught us the importance of using linked medical and public health data to identify and respond to health risks on a real-time basis," says the study's senior author Jonathan Weiner, DrPH, co-director of the Center for Population Health Information Technology and professor in the Department of Health Policy and Management. "This study offers evidence that data already in every state's possession can be used to redouble our efforts to help individuals and communities still being decimated by the opioid overdose epidemic."

More information: Brendan Saloner et al, Predictive Modeling of Opioid Overdose Using Linked Statewide Medical and Criminal Justice

Data, *JAMA Psychiatry* (2020). DOI: 10.1001/jamapsychiatry.2020.1689