THE LAW OF EPIDEMICS

Heroin, Prescription Painkillers, and the Addiction Dilemma

by Alisa Roth
Drug abuse spreads within a community, sometimes quickly. It devastates. And it kills. But unlike diseases such as HIV or Ebola, drug abuse is not, technically, infectious.

So, is talking about an epidemic of drug abuse—the surge in opioid and heroin abuse reported this summer by the Centers for Disease Control and Prevention, for example—just a sloppy metaphor? Or can we actually use epidemiological tools to predict its course and figure out ways to stop it?

Epidemiologist Guohua Li, DrPH, MD, thinks we can. According to Farr’s law, infectious outbreaks follow a predictable and symmetrical path—a steady rise in cases to a peak, followed by a decline. The 19th-century model has been applied to cattle plague, smallpox, even the AIDS epidemic. In a January article in the journal *Injury Epidemiology*, Li, the Finster Professor of Epidemiology, and his research team applied it to drug use in the United States. If Li’s resulting predictions are correct, the number of drug overdoses will keep rising until 2017, then begin to fall.

“One of the contentious points,” he says, “is to apply Farr’s law to a noninfectious epidemic like opioid abuse.” As with infectious diseases, he says, environmental factors play a part in drug abuse trends. Addiction—like other “social contagions” such as behavioral disorders and obesity—spreads through social networks, much like a pathogenic outbreak. If his projections are borne out, says Li, they “may help to gauge whether interventions are working and guide long-term planning and management of public health resources and prevention efforts.”

In the last two years, the increase in overdoses of opioid painkillers—Demerol, Dilaudid, Vicodin, and the like—has begun to slow, likely because multiple ongoing interventions are starting to work. Prescription monitoring programs, as the name suggests, are statewide databases that track the dates and details of all prescriptions for controlled substances. They’re designed to make it more difficult for patients to shop around, getting multiple doctors to prescribe opioid painkillers or using multiple pharmacies to fill a single prescription. (Some states even make the information available in neighboring states, to prevent a New Yorker, for example, from scoring a duplicate prescription in New Jersey or Connecticut.)

Meanwhile, drug companies have been reformulating opioid painkillers to make them harder to abuse. And increasing access to overdose treatment—by having police carry the antidote naloxone, for example—has helped.

But as the fairy tales caution, beware what you wish for. The current heroin
epidemic is a result, at least in some measure, of the success states have already had in limiting access to opioid painkillers. As pharmaceuticals become less accessible, people turn to heroin. “We call this the substitution effect,” Li says. “It’s going to make control of this drug overdose epidemic more challenging.”

Between 2002 and 2013, the number of people in the U.S. dying from heroin overdose quadrupled. And in 2013, more than half a million Americans said they had used heroin in the past year, an increase of almost 150 percent from 2008.

It’s gotten so bad that, in the last three years, drug overdose has been overtaking motor vehicle crashes as the leading cause of accidental death in the U.S.; in 34 states, it already has. For Li, much of whose earlier work focused on traffic injuries, turning his attention to drug abuse and prevention was a logical shift. And, he points out, there is even overlap between the two, since driving under the influence is (obviously) dangerous.

Beyond vehicular risks—public health scholars know them as “unintentional injury mortality”—opioid injection poses additional hazards. Heroin use has been implicated in the spread of HIV, hepatitis C, and other blood-borne diseases. Earlier this year, the governor of Indiana declared a public health emergency in rural Scott County after health officials there noticed a surge in the number of new HIV infections tied to intravenous use of opioid painkillers. The county had already recorded an increase in hepatitis C and endocarditis, an infection of the lining of the heart that can be spread through the use of dirty needles. The governor, who had previously been opposed to harm reduction programs, quickly stepped in to implement a temporary needle-exchange program.

Given the geographic concentration of the painkiller abuse, the intervention focused narrowly on Scott County. That approach exemplifies one of the first steps in figuring out how to stop an epidemic: Understand who’s involved. Associate Professor of Epidemiology Silvia Martins, MD, PhD, uses data from the federal government’s National Survey on Drug Use and Health to analyze who is using opioid painkillers and heroin and how those patterns have changed over the last few years.

In a report this year for Drug and Alcohol Dependence, Martins documented critical differences in drug abuse across racial and other lines. Between 2002 and 2011, for example, heroin use rose 75 percent among non-Hispanic whites. Among blacks, on the other hand, use increased only among those who had taken opioid painkillers within the prior year, particularly those who had used them frequently—at least once daily for between 100 and 365 days. “We need to better delineate who is at higher risk,” Martins says, and target prevention programs to those populations.

That means updating old-fashioned “Just Say No”–style drug abuse prevention programs to promote harm reduction, the drug use equivalent of teaching safe sex rather than abstinence only.

In an age of Google and the increased information—and misinformation—the
introduced, we need comprehensive public education, Martins says. With prescription drugs, that means explaining not only the benefits of the medication but also its side effects, not stigmatizing prescription opioid use, and reminding people that it’s important to get professional help for psychological problems, rather than trying to self-medicate. (In another study, published in Psychological Medicine, Martins documented a higher incidence of opioid drug use among people with mental illnesses like bipolar disorder and anxiety and mood disorders.)

Equally important, Martins says, is targeting the right audience with those drug abuse prevention programs. Many universities emphasize the dangers of opioid abuse in their drug prevention programs. Martins’ study published last year in Social Psychiatry and Psychiatric Epidemiology showed that people who don’t have a college education are more likely than those with a degree to abuse opioid painkillers. It would probably be more effective, she says, to find ways to engage a non-college educated audience to talk about opioid drug abuse and perhaps refocus college programs to address stimulants, which her studies show are a bigger problem among people with a college education.

The U.S., Martins says, has the highest rate of opioid painkiller use in the world; medical professionals here use the drugs not just to manage the extreme pain caused by, say, cancer but also to manage much less serious complaints, like the discomfort following a tooth extraction.

So healthcare providers and policymakers will have to do their part. This summer, the U.S. Senate debated the Safe Prescribing of Controlled Substances Act, which would impose new continuing education requirements on prescribers (already required in New York and nine other states), while the White House boosted training for federal healthcare providers.

At the state level, prescription monitoring programs vary widely. While 49 states have laws in place, Missouri legislators have wrangled for years over competing bills. Nationwide, Martins sees room for improvement. Physicians could inquire about prior drug use and mental health history, for example, to identify patients for whom opioids might become a problem, then monitor those individuals more closely or offer them alternatives such as physical therapy or non-narcotic painkillers.

Then there’s the question of how people end an addiction. Only a small number of those with a drug problem seek treatment, says Martins. Others just quit using on their own. Certainly, we need monitoring programs and other interventions to avert overuse and addiction. But that won’t be enough. “It’s complicated,” she says. “We need policies to regulate this, but we also need to make sure that people who need medications can get them.”

Regardless how difficult the work may be, says Li, public health has a duty to help turn the tide. “A decline in overdose deaths shouldn’t be used as justification to pull back,” he says. “That would be wrong. If there is no intervention, then the epidemic will last much longer.”

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