

supervised injection facilities. Similarly, although British Columbia has succeeded in greatly expanding the use of opioid agonist treatment, it has been slow to recognize the important role that extended-release naltrexone could probably play in improving outcomes for people with opioid addiction, particularly patients who may not wish to pursue treatment with agonist medications.

As in the United States, failure to invest in education for health professionals with regard to evidence-based treatment for addiction has hampered the development and staffing of treatment programs.<sup>4</sup> Similarly, people with opioid use disorder, including those in recovery, have not always been adequately consulted in service-delivery planning. As a result, although regulatory changes have been made with the goal of facilitating the rapid expansion of opioid agonist medication programs, such measures haven't been accompanied by plans to augment British Columbia's large, publicly funded network of recovery programs and

to integrate these much-needed supports. Recovery programs and clinical addiction services in Canada — like those in the United States — continue to operate largely independently.<sup>5</sup>

Finally, as in other North American jurisdictions, there remains an overreliance on criminal-justice interventions for people with opioid use disorder in British Columbia and inadequate community-based care on release from jail. Although rates of criminal-justice involvement remain lower than rates in the United States, recent surveillance reports indicate that arrests for heroin possession in the province increased by more than 250% between 2010 and 2015. Furthermore, approximately one third of the 1854 people who died from overdoses in British Columbia between January 2016 and July 2017 were under community supervision (i.e., out of jail on bail or paroled) or had been released less than 2 years earlier.

Every indication is that North America's opioid-overdose crisis is not abating, and experts have recently estimated that overdoses

could kill more than half a million Americans over the next decade. Bold action on the part of policymakers will be required to support innovative evidence-based approaches and to assess and apply lessons learned from other jurisdictions.


Disclosure forms provided by the author are available at [NEJM.org](http://www.nejm.org).

From the Department of Medicine, University of British Columbia, and the British Columbia Centre on Substance Use — both in Vancouver, Canada.

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DOI: 10.1056/NEJMp1800216

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expansion of opioid agonist medication programs, such measures haven't been accompanied by plans to augment British Columbia's large, publicly funded network of recovery programs and

## Suicide: A Silent Contributor to Opioid-Overdose Deaths

Maria A. Oquendo, M.D., Ph.D., and Nora D. Volkow, M.D.

As the toll of opioid-overdose deaths in the United States rises, we face an urgent need for prevention. But preventing such deaths will require a better understanding of the diverse trajectories by which overdoses occur, including the distinction between intentional (suicide) and unintentional (accidental) deaths, be they in patients with chronic pain who

overdose on their opioid analgesics or in those with a primary opioid use disorder (OUD). Interventions to prevent overdose deaths in suicidal people will differ from interventions targeted at accidental overdoses. Yet most strategies for reducing opioid-overdose deaths do not include screening for suicide risk, nor do they address the need to tailor interven-

tions for suicidal persons. Moreover, the inaccuracy of available data on the proportion of suicides among opioid-overdose deaths — which are frequently classified as “undetermined” if there is no documented history of depression or a suicide note — hinders deployment of appropriate prevention services.

In 2016, the Centers for Dis-

ease Control and Prevention (CDC) reported 42,000 opioid-overdose fatalities, including an unknown number of suicides. Notably, two populations that are more likely than others to receive opioid prescriptions — patients with chronic pain and those with mood disorders — are also at greater risk for suicide. Patients with a substance use disorder are at increased risk for suicide as well, and although opioid overdoses are uncommon among suicide attempts in such patients, suicides by poisoning are far from rare. Difficulties in ascertaining the manner of death probably result in the underreporting of opioid-overdose deaths as suicides.<sup>1</sup>

The distinction between unintentional and volitional deaths may be blurred among people with OUD, whose motivation to live might be eroded by addiction. Such erosion can have a range of effects, from engagement in increasingly risky behaviors despite a lack of conscious suicidal intent to frank suicidal ideation and intent. This entire spectrum can lead to opioid-overdose deaths, but little attention has been given to its contribution to overdose mortality.

Of the estimated 44,965 suicides in the United States in 2016, about 50% were carried out by firearm and about 15% by drug overdose, according to the CDC. The proportion of suicides that were opioid overdoses rose from 2.2% to 4.3% between 1999 and 2014, with the highest increases occurring among people 45 to 64 years of age.<sup>2</sup> On the other hand, 17% of drug-related deaths (all drugs, not only opioids) in 2010 were classified as suicides.<sup>3</sup> Similarly, an analysis of opioid-overdose deaths in Utah in 2008 and

2009 showed that 21% of 2086 such deaths were attributed to suicide and 16% were classified as undetermined.<sup>4</sup> Even people deemed to have died of an “unintentional overdose” frequently had suicide risk factors: depression, substance use disorders, and financial problems. Among those who died from an overdose of an illicit drug (including opioids), the age-adjusted rate of intentional overdose (suicide) increased by 61% in urban areas and 84% in nonurban areas between 1999 and 2015.<sup>3</sup> Nonetheless, the percentage of the estimated 42,000 opioid-overdose deaths in 2016 that were suicides is not well documented.

One challenge in determining the manner of death in opioid-overdose fatalities is that the medical examiner or coroner cannot know the decedent’s intent with certainty. Absent a suicide note, determinations are based on autopsy, information collected at the scene of death, and circumstantial evidence. Indeed, percentages of overdose deaths classified as undetermined vary greatly from state to state, ranging from 1% to 85% between 2008 and 2010, with an average of 8%.<sup>5</sup> Sources of variability include individual factors (e.g., observer bias, fear of litigation), system factors (e.g., variability in definitions, death-scene investigations), and state-level factors (e.g., variation in classification of multidrug overdoses). The CDC recently called for actions such as standardization of definitions and practices and protection against litigation to reduce this variability.<sup>5</sup> Although the percentage of deaths classified as undetermined dropped to 6.7% between 2011 and 2014, the absolute number of deaths from

overdoses of undetermined intent has increased significantly as overdose fatalities have more than tripled between 1999 and 2016.

At the same time, data from multiple sources strongly suggest that the proportion of opioid-overdose deaths that are suicides is considerable. A study of nearly 5 million veterans using National Death Index data and treatment data from electronic health records found that diagnoses of any substance use disorder were associated with increased suicide risk. Among persons with OUD, the suicide risk was 87 in 100,000 — six times the general U.S. population rate of 14 in 100,000; even after controlling for other suicide risk factors such as coexisting psychiatric diagnoses, OUD more than doubled the risk of suicide among women and increased the risk among men by 30%.

Similarly, 2014 data from the National Survey of Drug Use and Health showed that an OUD involving prescription opioids was associated with an increase of 40 to 60% in the risk of suicidal ideation, after controlling for overall health and psychiatric conditions. People using opioids regularly were at greatest risk: they were about 75% more likely to make suicide plans and twice as likely to attempt suicide as people who did not report any opioid use. Though suicidal ideation and attempts are not the same as suicide deaths, they are predictors of eventual suicide.

Perhaps of most relevance, 2006–2011 data from the Nationwide Emergency Department Sample that include information on more than 250,000 emergency department visits by adults for opiate overdose show that only 54% of the overdoses were classi-

fied as “unintentional”: 26.5% were deemed intentional, and 20.0% were “undetermined.” The data also document a steady annual increase in opiate-overdose visits to emergency departments. Together, these data suggest that the true proportion of suicides among opioid-overdose deaths is somewhere between 20% and 30%, but it could be even higher.

What can be done? Certainly, efforts are afoot to change opioid prescription practices and to expand medication treatment for people with OUD, and such efforts should be energetically pursued. In addition, we could tailor interventions to reduce opioid-overdose deaths more effectively by pursuing policy interventions such as implementing the CDC’s recommendations for determining the manner of death<sup>5</sup>; educating clinicians about the need to screen for suicide risk in patients with conditions for which opiates are prescribed, especially chronic pain, and in those with a substance use disorder; and standardizing screening for suicide risk and for treatment referral among emergency department patients who have overdosed.

Educational campaigns to in-

crease public awareness of suicide risk could engage family and friends in interventions to prevent suicidal overdoses by seeking medical assistance. Campaigns to reduce the double stigma associated with suicide and drug addiction might make patients more willing to seek treatment.

In parallel, research to evaluate the mechanisms underlying the high rate of suicidal behavior in patients with chronic pain and in those with OUD could help guide development of prevention and therapeutic strategies. Research should also evaluate which are the most effective treatment interventions in people with OUD who are also at high risk for suicide, as well as interventions targeting risk factors that have only recently begun to be studied, such as low motivation to live. Finally, research aimed at the development and validation of screening tools to help characterize suicide risk along a continuum of awareness regarding suicidal intent would improve identification of persons who are at greater risk.

The significant increases in both opioid-overdose deaths and suicide rates in our country have contributed to reduced life ex-

pectancy for Americans. These two epidemics are intermingled, and solutions to address the opioid crisis require that we tailor interventions to preventing opioid-overdose deaths due to suicidal intent.

Disclosure forms provided by the authors are available at [NEJM.org](http://NEJM.org).

From the Perelman School of Medicine, University of Pennsylvania, Philadelphia (M.A.O.); and the National Institute on Drug Abuse, Bethesda, MD (N.D.V.).

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DOI: 10.1056/NEJMp1801417

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## The Long Ride Home

David N. Korones, M.D.

The loud, unwieldy bipap machine seemed to smother Hannah as she was wheeled out of the pediatric ICU for the last time. The apparatus thrust air into her leukemia-riddled lungs with such force it was hard to tell whether she had anything to do with the mechanical, rhythmic

rise and fall of her chest. Eight years old, Hannah had relapsed acute myelogenous leukemia. After exhaustive attempts to control her disease and a month of steady decline in the ICU, it was time for her to go home. Her parents held onto hope — in part for a cure, but in larger part for just

getting her home. They simply wanted to take their daughter back to their cozy double-wide trailer that had been lovingly prepared for her arrival. What happened after that, well, the Lord would take it from there.

As Hannah was wheeled out of the ICU, the transport nurse