

DRUG & ALCOHOL FINDINGS

Research analysis

This entry is our analysis of a study considered particularly relevant to improving outcomes from drug or alcohol interventions in the UK. The original study was not published by Findings; click [Title](#) to order a copy. Free reprints may be available from the authors – click [prepared e-mail](#). The summary conveys the findings and views expressed in the study. Below is a commentary from Drug and Alcohol Findings.

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► Modelling the combined impact of interventions in averting deaths during a synthetic-opioid overdose epidemic.

Irvine M.A., Kuo M., Buxton J.A. et al.

Addiction: 2019, 114, p. 1602–1613.

Unable to obtain a copy by clicking title? Try asking the author for a reprint by adapting this [prepared e-mail](#) or by writing to Dr Irvine at m.irvine@math.ubc.ca.

In the Canadian province of British Columbia there was a rapid rise in overdose deaths from 2015, leading to the declaration of a public health emergency in 2016. The response rested on three key interventions: take-home naloxone, opioid substitution therapy, and drug consumption rooms. The province's highly detailed surveillance data offered an opportunity to estimate their collective and individual impacts on opioid overdose deaths.

SUMMARY The opioid crisis in North America has primarily been driven by changes in the prescription of opioids and the introduction of highly potent, synthetic opioids into the illicit (street) drug market (1 2 3). The featured study sought to estimate the impact of various opioid overdose interventions on the number of deaths averted in the province of British Columbia (Canada) where, at the time of publication, illicit drug overdose deaths outnumbered those due to suicide, motor vehicle accident and homicide combined.

In British Columbia, regional efforts to respond to the overdose crisis initially focused on: (1) rapidly scaling-up a programme of take-home naloxone, an overdose antidote packaged to be carried (and used) by people likely to witness an overdose; (2) the opening of overdose prevention services offering a safe space for people to inject under clinical supervision (also known as drug consumption rooms); and (3) supporting the uptake of opioid substitution therapies including buprenorphine–naloxone and methadone.

The study focused on understanding the individual and collective impact of these interventions prior to and after the declaration of the regional public health emergency:

- Prior to the declaration of the public health emergency ('pre-emergency'): January 2012 to April 2016.
- After the declaration of the emergency ('post-emergency'): April 2016 to the end of 2017.

Using information about the underlying monthly risk of overdose and probability of subsequent death, the researchers studied a series of scenarios to estimate the number of deaths averted by each intervention – considering what actually happened (the 'factual' scenario) and what would have happened in the absence of the intervention (the 'counterfactual' scenario).

Autopsy reports from British Columbia's coroners service provided data on illicit drug overdose deaths, including deaths where fentanyl (a synthetic opioid often mixed with heroin and/or cocaine in the illicit drug market) was detected. The number of overdoses was informed by records of ambulance call-outs where an accidental opioid overdose or probable overdose had occurred, take-home naloxone kits returned after having been used, and records of overdoses being witnessed in drug consumption rooms.

The probability that naloxone from a take-home naloxone kit would be administered following an overdose depends in part on the number of kits in circulation in the region. It was assumed that all interventions involving take-home naloxone or occurring on the premises of drug consumption rooms had resulted in survival. People in receipt of opioid substitution therapy were assumed to be at reduced risk of an overdose, and if they ceased using opioid substitution therapy, the risk was deemed to be elevated in the following month.

Background to the interventions

In 2012, the year the take-home naloxone programme started in British Columbia, only 269 kits were distributed, rising to 88,300 kits in 2017. Take-home naloxone kits are now distributed by all emergency departments, all provincial correctional facilities and some community pharmacies. A [previous study](#) about the impact of the British Columbia take-home naloxone programme from January 2012 to June 2016 found that it significantly reduced the number of overdose deaths during the earlier part of the current crisis.

Drug consumption rooms provide hygienic and supervised spaces for people to inject or otherwise consume illicit drugs, and through staff overseeing drug use, ensure that any accidental overdoses are witnessed and someone is there to step in with life-saving support at the right time. In British Columbia drug consumption rooms were started by community members and approved by the British Columbia Minister of Health in December 2016. By the end of 2017, 23 sites were operating. For the purposes of this paper, two supervised consumption sites were included, which also provide enhanced access to addiction services and on-site medical professionals.

The first-line treatment for opioid use disorder is opioid substitution therapy – medications available by prescription within British Columbia. Based on provincial records for prescriptions dispensed from pharmacies the monthly average of people receiving opioid substitution therapy between 2012 and 2015 was 18,095. This increased by 19% in 2017 to 22,191.

Main findings

Overall estimated impact



Key points From summary and commentary

The province of British Columbia (Canada) experienced a rapid increase in illicit drug overdoses and deaths from 2015, to the point where a public health emergency was declared in 2016. Deaths were driven primarily by the introduction of synthetic opioids into the illicit opioid supply.

The featured study aimed to measure the individual and collective impact of opioid overdose interventions on the number of deaths averted, in particular during the early stages of the regional public health emergency between April 2016 and December 2017.

Without these interventions the number of overdoses resulting in a death would have been substantially higher. The rapid scale-up of interventions was estimated to have reduced the number of deaths by 60%.

In the face of opioid overdose crises such as in the UK, the findings demonstrate the lifesaving potential of a large-scale harm reduction programme.

Between 2012 and the end of 2017 there were 2,177 overdose deaths in British Columbia, 77% of which involved fentanyl. In total an estimated 3,650 death events were averted by take-home naloxone, opioid substitution therapy, and drug consumption rooms during the study period.

Prior to the declaration of the public health emergency an estimated 660 death events were averted, rising to 3,030 deaths averted after the declaration of the emergency. Deaths averted represented 52% of all estimated possible deaths during the whole study period (31% pre-emergency and 60% post-emergency).

Individual effects

The total number of deaths averted due to take-home naloxone was estimated to be 1,650, corresponding to 11 kits used per death averted. Of the total estimated possible deaths, 4% were pre-emergency (90 deaths) and 31% were post-emergency (1,580 deaths).

The total number of deaths averted at drug consumption rooms was 390, with 8% of all potential deaths averted pre-emergency and 5% post-emergency. The estimated number of deaths averted per site per month was 1.3.

The total number of deaths averted due to opioid substitution therapy was 960. Of these, 390 were pre-emergency (18% of estimated possible deaths) and 590 were post-emergency (12% of estimated possible deaths).

Combined effects

Take-home naloxone plus drug consumption rooms averted 260 deaths pre-emergency and 1,960 post-emergency.

Drug consumption rooms plus opioid substitution therapy averted 550 deaths in the pre-emergency period and 830 in the post-emergency period.

Take-home naloxone plus opioid substitution therapy averted 480 deaths pre-emergency and 2,630 post-emergency.

A further analysis [for which a [supporting document](#) was consulted] was conducted to assess the impact of each data source on the results – ie, how confident we can be in the estimates of deaths averted when different observations are removed from the statistical model. Removing ambulance call-out survey data inflated the number of deaths averted to 5,013 and take-home naloxone became a more significant contributor to the figures of averted deaths. This finding suggested that the number of ambulance-attended overdoses was critical to estimating the total deaths averted.

The authors' conclusions

The study provided an estimate of the impact of three key substance use interventions, made possible by the highly detailed surveillance data in the region and its public health focus on harm reduction.

The rapid scale-up of take-home naloxone, opioid substitution therapy, and drug consumption rooms was estimated to have reduced the number of deaths by 60% during the early stages of the public health emergency in British Columbia. To further reduce overdose deaths, interventions that address the contaminated drug supply along with opioid substitution therapies will probably be needed.

One of the limitations of the study was that researchers were only able to analyse those interventions for which data existed, leaving out the potential contribution of approaches such as general education of the at-risk population through information campaigns, stigma reduction activities, provider training initiatives, and specific alerts.

FINDINGS COMMENTARY In the face of opioid overdose crises such as in the UK, the findings demonstrate the lifesaving potential of a large-scale harm reduction programme. The featured study found that the combined effect of take-home naloxone programmes, opioid substitution therapy, and drug consumption rooms was a 52% total reduction in overdose deaths between 2012 and 2017.

Take-home naloxone had the greatest individual effect on deaths overall, averting 1,650 deaths (versus 960 from opioid substitution therapy and 390 from drug consumption rooms). The combined effect of all three interventions was an estimated 3,650 deaths averted. In very close second was the 3,110 deaths averted by the combined impact of take-home naloxone plus opioid substitution therapy.

Drug consumption rooms averted comparatively few deaths on their own and in combination with the other interventions. However, it would be a mistake to read from this that drug consumption rooms are the most disposable arm of overdose prevention in this region. They are [typically aimed at](#) people who are extremely vulnerable to harm due to social exclusion, poor health and homelessness, rather than all people who use drugs, and include people injecting on the streets and not currently in treatment. Though the [target group](#) tends to be limited by design, the impact for the group could be significant – saving lives, but also maintaining contact with those often considered 'hard-to-reach', facilitating access to medical care, reducing immediate risks related to drug consumption, and stabilising and promoting health.

As the researchers acknowledged, risk of overdose is not distributed evenly across the population, meaning that multiple "death events" may have been averted for one individual. Future studies could home in on the survival patterns of particular segments of the population, and how interventions mitigate their level of risk.

In the UK context, only two out of the three interventions (opioid substitution therapy and take-home naloxone) have been rolled out. In England a [robust analysis](#) of similar design to the featured study estimated that opioid substitution therapy prevented 880 opioid-related overdose deaths in England each year between 2008 and 2011, reducing total deaths by over 40%. A [2016 review](#) of take-home naloxone found that the intervention has led to improved survival rates among programme participants and reduced heroin overdose mortality rates, and is accompanied by only a low rate of adverse events. Both of these interventions are examined in more depth and detail in Effectiveness Bank hot topics ([1](#) [2](#)).

If there was an evidentiary threshold for trialling drug consumption rooms in the UK, the Home Affairs Select Committee on drugs policy, Independent Working Group on Drug Consumption Rooms, and Advisory Council on the Misuse of Drugs were confident in [2002](#), [2006](#), and [2016](#) (respectively) that this had been passed. However, according to recent statements from the Home Office and (then) Prime Minister, the UK Government has "no intention" ([1](#) [2](#)) and "no plans" to introduce drug consumption rooms.

For related reading choose from a selection of Effectiveness Bank hot topics on [drug consumption rooms](#), [preventing overdose deaths](#), [take-home naloxone](#), [opioid substitute prescribing](#), and the overlapping problems associated with [homelessness and substance use](#).

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