



COMMENTARY

The evolution of the overdose epidemic and CDC's research response: a commentary

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Abstract

The United States drug overdose epidemic has reached an all-time high, with 2020 provisional mortality data indicating that over 90,000 lives were lost to drug overdose in the 12-months ending in December 2020. The overdose epidemic has evolved over time with respect to the substances involved in overdose deaths and also with respect to the geographic distribution and epidemiology of deaths involving specific substances. Thus, a nimble approach to addressing the epidemic and preventing future overdoses is needed. CDC's response to the overdose epidemic supports implementation efforts at the state and local levels, where partners can better detect and respond to the evolving drug overdose landscape and implement prevention measures that meet their needs. CDC's framework for responding to the overdose epidemic focuses on five areas: (1) conducting surveillance and research; (2) building state, local and tribal capacity; (3) supporting

providers, health systems and payers; (4) partnering with public safety; and (5) empowering consumers to make safe choices. Central to informing the implementation of evidence-based strategies to prevent drug overdose is rigorous research that undergirds the evidence. This Commentary describes recent investments in overdose prevention research and outlines opportunities for ensuring that future research efforts allow for the flexibility necessary to effectively respond to the continually evolving epidemic.

Keywords: overdose, overdose prevention, prevention research.

Citation

Holland KM, DePadilla L, Gervin DW, Parker EM, Wright M. The evolution of the overdose epidemic and CDC's research response: a commentary. *Drugs Context*. 2021;10:2021-8-2. <https://doi.org/10.7573/dic.2021-8-2>

The overdose epidemic in the United States has reached an all-time high, with 2020 provisional data indicating that over 90,000 lives were claimed by drug overdose in the 12-months ending December 2020.¹ Prior studies highlight an overdose epidemic that has evolved over time with respect to the substances involved in overdose deaths and in the geographic distribution and epidemiology of deaths involving specific substances.^{2,3} Whereas the overdose epidemic was initially driven by prescription drug overdoses in the 1990s and early 2000s,⁴ a second wave of overdose deaths primarily involving heroin began in 2010.⁵ More recently, however, death rates of highly potent and lethal synthetic opioids – primarily illicitly manufactured fentanyls – increased 1040% from 2013 to 2019 and the psychostimulant-involved death rate increased over 300% during the same period.⁶ Further, overdose deaths are more frequently involving multiple drugs, with overdoses for psychostimulants, cocaine, prescription opioids, and heroin increasingly co-involving synthetic opioids from 2013 to 2019.⁶ Just as the substances involved in overdose

deaths have evolved, so too has the geographic distribution of such deaths, and overdose death rates continue to increase. Examination of overdose deaths demonstrates a westward expansion of illicitly manufactured fentanyl-involved deaths, where a 98.0% increase in synthetic opioid deaths was observed in 10 states in the west from the 12 months ending in June 2019 to the 12 months ending in May 2020.⁷ Additionally, whereas historically, psychostimulant-involved deaths have been concentrated in the west, recent increases in psychostimulant-involved death rates have been observed in the east.⁶ Finally, the most recent mortality data suggest that the overdose epidemic has accelerated and worsened during the COVID-19 pandemic, with provisional data pointing to a 29.4% increase in predicted overdose deaths from the 12 months ending in December 2019 to the 12 months ending in December 2020.¹

The evolving nature of the overdose epidemic calls for an agile approach to prevention. To meet this need, CDC's response

involves an emphasis on supporting implementation efforts at the state and local levels, where partners may be better able to detect and react to the evolving drug overdose landscape and implement prevention measures that meet their needs. CDC’s framework for responding to the overdose epidemic focuses on five areas: (1) conducting surveillance and research; (2) building state, local and tribal capacity; (3) supporting providers, health systems and payers; (4) partnering with public safety; and (5) empowering consumers to make safe choices.⁸

In implementing this overall framework, CDC’s Division of Overdose Prevention (DOP) supports many efforts at the state and local levels to prevent overdose. For example, by funding 66 jurisdictions in September 2019, the multi-year Overdose Data to Action cooperative agreement supports jurisdictions in collecting data on non-fatal and fatal overdoses and using those data to inform prevention and response efforts. The Drug-Free Communities Support Program – managed through a partnership between the White House Office of National Drug Control Policy and CDC – provides funds for community coalitions to reinforce the local infrastructure to reduce and prevent youth substance use. The Overdose Response Strategy is a collaboration between CDC and High Intensity Drug Trafficking Areas designed to strengthen public health and public safety partnerships to reduce fatal and non-fatal drug overdoses. CDC’s Rx Awareness campaign describes people whose lives were impacted by prescription opioid use to raise awareness about the addictive nature of prescription opioids, reduce the stigma of addiction and recovery, and help those struggling with prescription opioid misuse locate treatment and resources.

Further, DOP has outlined a number of priority research gaps and questions to drive research activities that have the greatest potential to impact public health.⁹ Central to the priorities are the identification of risk and protective factors across socioecological levels, the evaluation of policies, programmes or practices designed to reduce overdose or the antecedents of overdose, and the identification of strategies and interventions that can be scaled up and translated to diverse communities, populations or settings. Key questions encompass the variation in risk and protective factors and trajectories for overdose across prescription opioids, illicit opioids, emerging drug threats and polydrug use; the impact and adoption of health system interventions and public health and public safety collaborations designed to prevent, respond and reduce drug overdose; and the effectiveness of new or innovative prevention approaches, including those designed to address populations at greatest risk. Also important is the examination of social determinants of health and health inequities that elevate the risk for substance use and overdose or serve as barriers or facilitators to the implementation of strategies to prevent overdose. These questions can inform a nuanced understanding of the complex nature of drug use trends and identify evidence-based practices for adoption and implementation, including amongst communities that are disproportionately affected by drug overdose.

DOP’s extramural research funding initiatives reflect the evolving nature of the overdose epidemic and efforts to address some of these research gaps. In fiscal year (FY) 2018, DOP, in partnership with the National Center for Injury Prevention and Control’s Office of Science Extramural Research Program Office (ERPO), supported investigator-initiated research to develop or rigorously evaluate primary or secondary strategies for preventing opioid overdose and opioid-related deaths. Fourteen recipients were issued awards totalling nearly US\$ 21M under this funding announcement to address research topics as diverse as evaluation of opioid prescribing guidelines, public-private safety and community-based partnerships for the prevention of opioid overdose and related deaths, and pharmacological intervention programmes administering buprenorphine and naloxone. In FY2019, DOP and ERPO released a funding announcement to support investigator-initiated rigorous evaluations of strategies used by state and local health departments to prevent overdose from prescription and illicit opioids. Eight awards were issued under this initiative, with many of these projects involving partnerships with state and local health departments to evaluate interventions within their jurisdictions, including academic detailing, drug treatment courts and pretrial diversion strategies, and interventions in emergency departments and community settings, which aimed to increase linkage to care to prevent future overdoses.

In FY2021, DOP and ERPO released a funding announcement intended to support one of two objectives: (1) the evaluation of prevention strategies that can be implemented at the state, community or systems level to prevent illicit stimulant or polysubstance use and overdoses, or (2) the assessment of risk and protective factors for illicit stimulant use, use disorder and overdose that can contribute to the development or adaptation of prevention strategies. This most recent funding announcement highlighted CDC’s intent to focus on disproportionately affected populations, including those experiencing high rates of stimulant-involved overdose, such as those disadvantaged by reduced economic stability, limited education attainment, access and quality, and limited access to quality healthcare. As such, CDC has begun to focus attention on the role social determinants of health and health inequities play in the overdose epidemic through its overdose prevention research efforts.

CDC’s research investments serve as a complement to its surveillance and programmatic initiatives funded through cooperative agreements and designed to support states and communities in their efforts to monitor non-fatal and fatal overdoses and address key drivers of the overdose epidemic at the local level. Whilst surveillance and programmatic efforts largely support local and state health departments and communities in the implementation of prevention activities, extramural research funding initiatives are often designed to evaluate programmes, policies and practices that have shown promise in preventing overdose to both build the evidence base for preventing overdose and to guide the field towards implementation of prevention strategies with demonstrated

effectiveness that could be scaled up in states and communities to broadly impact public health and to reduce overdose morbidity and mortality at the population level.

The research highlighted in this special issue is of great importance. A literature review provides insight on academic detailing efforts that serve as targeted interventions to ensure clinicians are appropriately trained in opioid prescribing and to improve opioid-related outcomes.¹⁰ This work highlights the critical role clinicians play in curbing the overdose epidemic by reducing initial exposure to opioids and ensuring safe prescribing practices. Empirical work in this issue points to advancements in understanding the impact of problem-solving courts as a prevention strategy for reducing opioid overdose.¹¹ This work serves to underline the perspective that preventing overdose extends beyond clinics to the broader community environment and incorporating social and behavioural aspects is critical to overdose prevention efforts. Other work in this special issue highlights the importance of being nimble in addressing a

national epidemic in the wake of a global pandemic and how implementation and evaluation efforts were modified during the COVID-19 pandemic.¹²

Conclusion

Future investments in overdose prevention research will require continued acknowledgement of the evolution of the overdose epidemic, incorporating efforts to respond to emerging drug threats and to improve our understanding of various trajectories of and contributors to substance use, such as exposure to adverse childhood experiences, social determinants of health and health inequities, which can serve to inform upstream prevention efforts. The work highlighted in this special issue serves to build the evidence base about what works to prevent overdose and provides guidance to states, communities and prevention scientists to ensure that evidence-based solutions are implemented to address the growing and evolving drug overdose epidemic.

Contributions: All authors contributed equally to the preparation of this review. All named authors meet the International Committee of Medical Journal Editors (ICMJE) criteria for authorship for this article, take responsibility for the integrity of the work as a whole and have given their approval for this version to be published.

Disclosure and potential conflicts of interest: The findings and conclusions in this report are those of the author(s) and do not necessarily represent the official position of the CDC/ATSDR. The authors declare that they have no conflicts of interest relevant to this manuscript. The International Committee of Medical Journal Editors (ICMJE) Potential Conflicts of Interests form for the authors is available for download at: <https://www.drugsincontext.com/wp-content/uploads/2021/11/dic.2021-8-2-COI.pdf>

Acknowledgements: We would like to acknowledge recipients of research funding from CDC’s Division of Overdose Prevention, particularly those funded under CE19-002, ‘Research Grants to Identify Effective Strategies for Opioid Overdose Prevention’, whose work is highlighted in this special issue.

Funding declaration: There was no funding associated with the preparation of this article.

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Article URL: <https://www.drugsincontext.com/the-evolution-of-the-overdose-epidemic-and-cdcs-research-response-a-commentary>

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Provenance: Invited; externally peer reviewed.

Submitted: 4 August 2021; **Accepted:** 18 October 2021; **Publication date:** 15 December 2021.

Drugs in Context is published by BioExcel Publishing Ltd. Registered office: Plaza Building, Lee High Road, London, England, SE13 5PT.

BioExcel Publishing Limited is registered in England Number 10038393. VAT GB 252 7720 07.

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References

1. Ahmad F, Rossen L, Sutton P. Provisional Drug Overdose Death Counts. National Center for Health Statistics; 2021. <https://www.cdc.gov/nchs/nvss/vsrr/drug-overdose-data.htm>
2. O’Donnell JK, Gladden RM, Seth P. Trends in deaths involving heroin and synthetic opioids excluding methadone, and law enforcement drug product reports, by census region – United States, 2006–2015. *MMWR Morb Mortal Wkly Rep.* 2017;66(34):897. <https://doi.org/10.15585/mmwr.mm6634a2>

3. Kariisa M, Scholl L, Wilson N, Seth P, Hoots B. Drug overdose deaths involving cocaine and psychostimulants with abuse potential – United States, 2003–2017. *MMWR Morb Mortal Wkly Rep.* 2019;68(17):388. <https://doi.org/10.15585/mmwr.mm6817a3>
4. Centers for Disease Control and Prevention. Vital signs: overdoses of prescription opioid pain relievers – United States, 1999–2008. *MMWR Morb Mortal Wkly Rep.* 2011;60(43):1487–1492.
5. Rudd RA, Paulozzi LJ, Bauer MJ, et al. Increases in heroin overdose deaths – 28 states, 2010 to 2012. *MMWR Morb Mortal Wkly Rep.* 2014;63(39):849–854.
6. Mattson CL, Tanz LJ, Quinn K, Kariisa M, Patel P, Davis NL. Trends and geographic patterns in drug and synthetic opioid overdose deaths – United States, 2013–2019. *MMWR Morb Mortal Wkly Rep.* 2021;70(6):202–207. <https://doi.org/10.15585/mmwr.mm7006a4>
7. Centers for Disease Control and Prevention. Increase in Fatal Drug Overdoses Across the United States Driven by Synthetic Opioids Before and During the COVID-19 Pandemic; 2020. <https://emergency.cdc.gov/han/2020/han00438.asp>. Accessed July 28, 2021.
8. Centers for Disease Control and Prevention. CDC’s Efforts to Prevent Opioid Overdoses and Other Opioid-Related Harms; 2020. <https://www.cdc.gov/opioids/framework/index.html>. Accessed August 2, 2021.
9. Centers for Disease Control and Prevention. Overdose Prevention Research Priorities. National Center for Injury Prevention and Control; 2020. https://www.cdc.gov/injury/pdfs/researchpriorities/DOPResearchPriorities_Final_508compliant-002.pdf. Accessed August 2, 2021.
10. Kulbokas V, Hanson KA, Smart MH, Mandava MR, Lee TA, Pickard AS. Academic detailing interventions for opioid-related outcomes: a scoping literature review. *Drugs Context.* 2021;10:2021-7-7. <https://doi.org/10.7573/dic.2021-7-7>
11. Van Nostrand E, Johnston A, Albert SM, et al. Evaluating problem-solving courts as a public health intervention to prevent opioid overdose. *Drugs Context.* 2021;10:2021-8-1. <https://doi.org/10.7573/dic.2021-8-1>
12. Morgan AR, Hendricks MA, El Ibrahim S, et al. COVID-19-related adaptations to the implementation and evaluation of a clinic-based intervention designed to improve opioid safety. *Drugs Context.* 2021;10:2021-7-5. <https://doi.org/10.7573/dic.2021-7-5>