




# A Thematic Analysis of Overdose Prevention and Response Efforts in States Experiencing Declines in Rates of Opioid-Involved Overdose Deaths

Public Health Reports  
2022, Vol. 137(4) 749–754  
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DOI: 10.1177/00333549211026816  
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## Abstract

**Objective:** To address the opioid overdose epidemic, it is important to understand the broad scope of efforts under way in states, particularly states in which the rate of opioid-involved overdose deaths is declining. The primary objective of this study was to examine core elements of overdose prevention activities in 4 states with a high rate of opioid-involved overdose deaths that experienced a decrease in opioid-involved overdose deaths from 2016 to 2017.

**Methods:** We identified 5 states experiencing decreases in age-adjusted mortality rates for opioid-involved overdoses from 2016 to 2017 and examined their overdose prevention programs via program narratives developed with collaborators from each state's overdose prevention program. These program narratives used 10 predetermined categories to organize activities: legislative policies; strategic planning; data access, capacity, and dissemination; capacity building; public-facing resources (eg, web-based dashboards); training resources; enhancements and improvements to prescription drug monitoring programs; linkage to care; treatment; and community-focused initiatives. Using qualitative thematic analysis techniques, core elements and context-specific activities emerged.

**Results:** In the predetermined categories of programmatic activities, we identified the following core elements of overdose prevention and response: comprehensive state policies; strategic planning; local engagement; data access, capacity, and dissemination; training of professional audiences (eg, prescribers); treatment infrastructure; and harm reduction.

**Conclusions:** The identification of core elements and context-specific activities underscores the importance of implementation and adaptation of evidence-based prevention strategies, interdisciplinary partnerships, and collaborations to address opioid overdose. Further evaluation of these state programs and other overdose prevention efforts in states where mortality rates for opioid-involved overdoses declined should focus on impact, optimal timing, and combinations of program activities during the life span of an overdose prevention program.

## Keywords

addiction, interventions, public health practice, qualitative methods, substance abuse

During 1999–2017, the number of overdose deaths from prescription opioids, heroin, and illicitly manufactured fentanyl increased significantly nationwide.<sup>1</sup> Although opioid-involved overdose deaths continued to increase nationally until 2017, some states with a high rate of opioid-involved overdose deaths experienced a decrease from 2016 to 2017. Nevertheless, the absolute number of drug overdose deaths remains high. Provisional data indicate that in the United States, 50 042 people died of an opioid-involved drug

overdose in 2019.<sup>2</sup> Thus, efforts are needed to prevent opioid-involved overdoses and related harms and better

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understand the broad scope of programmatic efforts that are under way in states, particularly states experiencing a decline in the rate of opioid-involved overdose deaths.

States are at the forefront of responding to and preventing opioid-involved overdoses in that they have the authority to implement policies, oversee practices, and deploy resources that can improve adverse overdose-related health outcomes. State health departments are also uniquely positioned to convene partners across multiple sectors to coordinate response efforts and evaluate program successes. Such a comprehensive approach is necessary for decreasing the number of overdose deaths and related harms.

The primary objective of this study was to examine core elements of overdose prevention activities in 4 states with high rates of opioid-involved overdose deaths that experienced a decrease in opioid-involved overdose deaths from 2016 to 2017. By qualitatively examining the activities of these states, we sought to gain insight into core elements of prevention and response programs that may have contributed to a reduction in opioid-involved overdose mortality. A secondary objective was to identify potential areas for future evaluation efforts.

## Methods

Using mortality data from the Centers for Disease Control and Prevention (CDC) Wide-ranging ONline Data for Epidemiologic Research,<sup>3</sup> we identified the 25 states with the highest age-adjusted opioid-involved overdose mortality rates in 2016. Including only the 25 states with the highest age-adjusted opioid-involved overdose mortality rates removed those states with low mortality rates, where a small change in the number of deaths could cause a large fluctuation in percentage change during the study period (2016-2017). Of the 25 states, we selected for analysis 4 states that had a decrease (regardless of significance) in age-adjusted mortality rates for opioid-involved overdose from 2016 to 2017: Massachusetts, New Hampshire, New Mexico, and Utah.

All 4 states received some form of opioid-focused funding from CDC during 2016 and 2017. Massachusetts, New Mexico, and Utah received CDC funding both to implement evidence-based prevention strategies to reduce overdose and to improve data collection on fatal and nonfatal overdose, whereas New Hampshire received CDC funding only to improve data collection on fatal and nonfatal overdose. As

such, we began our program narratives by reviewing data from annual progress reports collected as a condition of CDC funding. These annual progress reports described activities implemented with the use of CDC funding, progress made with respect to these activities, and successes and challenges. The 4 states we examined received additional overdose-focused funding from other federal (and likely nonfederal) sources. However, the purpose of our analysis was not to attribute observed changes in opioid-involved overdose mortality to any particular funding; therefore, documentation of other overdose-focused funding was outside the scope of this article.

In addition to a review of annual reported data obtained from CDC-funded state partners, we conducted an environmental scan of federal, state, and programmatic websites and other materials (eg, strategic planning documents, data briefs) to comprehensively capture information on overdose prevention and response activities in the 4 states.

After an internal review of programmatic data and environmental scans were completed, 3 authors (A.B.R., N.A., O.C.) created draft program narratives. Although the 4 states were identified on the basis of opioid-involved overdose mortality statistics, program narratives include descriptions of programmatic efforts aimed at preventing both opioid-involved overdose and drug overdose more broadly. Ten predetermined categories were used to organize activities implemented by each state. This list of categories was developed through the 3 authors' (A.B.R., N.A., O.C.) review of data obtained by the preliminary environmental scan and informed by CDC's recommended evidence-based prevention strategies.<sup>4</sup> These categories were

- Legislative policies
- Strategic planning (eg, task forces, workgroups, coordinated plans)
- Data access, capacity, and dissemination
- Capacity building (eg, within-department capacity, local health department capacity, technical assistance to communities)
- Resources for use by the public (eg, web-based dashboards, awareness campaigns)
- Training resources (eg, for health care providers, first responders)
- Prescription drug monitoring program (PDMP) enhancements and improvements (eg, interstate data sharing, electronic health record integration)

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- Linkage to care (eg, diversion programs, peer navigators, place-based programs)
- Treatment (eg, improving access, capacity, delivery)
- Community-focused initiatives (eg, harm reduction and population initiatives, such as among the justice-involved population or people experiencing homelessness)

For each state, overdose program implementers (eg, overdose prevention managers, epidemiologists, evaluators) were identified as collaborators. These collaborators were tasked with updating and providing additional information to ensure program narratives were accurate and comprehensive. Although overdose mortality data from 2016-2017 were used to determine states for inclusion in our analysis, some states provided relevant historical information that demonstrated the evolution of overdose prevention activities. The approach of these state collaborators to gathering input from their program partners varied—1 state convened a roundtable meeting, whereas other states worked iteratively with their program staff members. (Supplemental tables are available from the authors.)

Three authors (A.B.R, N.A., O.C.) performed systematic content analysis of the completed program narratives using an iterative thematic approach to coding.<sup>5</sup> The objective of this thematic analysis was to elucidate prevention program activities and to generate hypotheses for future research rather than determine attributable program impact. The systematic content analysis used by the 3 authors (A.B.R., N.A., O.C.) involved using the organizing categories of the program narratives as the first level in our hierarchical coding framework. Categorization of activities that spanned more than 1 category (eg, legislation for treatment) was

determined by state-level collaborators and, therefore, may vary across the 4 narratives. The 3 authors (A.B.R., N.A., O.C.) distilled descriptions of each activity in a category into thematic codes to identify common themes occurring across multiple narratives. These common themes were then used to organize and identify activities implemented by all 4 states (ie, “core activities”) to prevent drug overdoses. In addition, thematic codes that did not occur across all 4 program narratives, but were believed by the 3 authors (A.B.R., N.A., O.C.) to exemplify approaches tailored to the local context, were used to organize and identify context-specific activities (ie, “additional elements”). Coding staff members held regular meetings to discuss and build consensus in coding when needed.

## Results

### Core Elements for Drug Overdose Prevention

Our thematic analysis revealed the following core elements: comprehensive state policies; strategic planning; local engagement; data access, capacity, and dissemination; targeted training for professional audiences; treatment infrastructure; and harm reduction (Table).

The 4 states had a robust programmatic foundation of multifaceted policies (ie, policies that address overdose in various sectors). Examples included Good Samaritan laws, PDMP access and/or use mandates, and policies to increase access to naloxone and/or treatment. These policies often preceded the development and implementation of programmatic efforts but were also updated as programmatic efforts identified additional policy needs.

**Table.** Core elements identified among 4<sup>a</sup> states that experienced declines in rates of opioid-involved overdose death, 2016-2017<sup>b</sup>

Core element	Description	Examples
Comprehensive state policies	Policies that support overdose prevention and response efforts implemented at the state level	Good Samaritan laws, mandates for prescription drug monitoring program access and use, laws on access to naloxone and treatment
Strategic planning	Comprehensive planning and coordination of overdose and prevention efforts across various partners and/or levels	Commissions, workgroups, advisory committees
Local engagement	Collaboration between state organizations and local counterparts	Technical assistance, trainings, dissemination of interventions
Data access, capacity, and dissemination	Efforts to share data on trends and inform overdose prevention and response efforts	Data aggregation and linkage, web-based dashboards, quarterly reports
Targeted training for professional audiences	Audience-specific training materials and interventions tailored to overdose prevention and response efforts	Health care providers, pharmacists, law enforcement officers, first responders
Treatment infrastructure	Efforts to ensure adequate treatment supplies, staff members, and systems	Reduced barriers, increased capacity
Harm reduction	Efforts to prevent overdose and overdose-related harms among people who use drugs	Naloxone access and distribution, syringe services programs

<sup>a</sup>New Hampshire, New Mexico, Massachusetts, and Utah.

<sup>b</sup>Defined as programmatic activities occurring in all 4 program narratives.

In addition to comprehensive policies, a common theme was comprehensive strategic planning at the state and local levels. Within these program narratives, strategic planning took the form of commissions, workgroups, advisory committees, documents, and multisectoral partnerships. States' organizational structures differed across the 4 states' programs, and each state was able to adapt to its hierarchy when coordinating these wide-reaching overdose prevention and response efforts. New divisions or departments were incorporated into the planning and conducting of overdose activities.

Another common theme across program narratives was local engagement by state health departments. State-based support and capacity building via technical assistance often took the form of creating and providing materials that outline strategies for local planning, implementation, and evaluation of overdose prevention activities; training jurisdictions on interpretation and use of overdose-related data to inform intervention; and disseminating evidence-based or practice-based interventions and providing tailored technical assistance as needed to guide implementation.

Our analysis revealed that data access, capacity, and dissemination played vital roles in overdose prevention and response activities described in the program narratives. Improved data capabilities, such as aggregating, linking, and analyzing, are necessary for the identification of populations disproportionately affected by opioid-involved overdoses and to inform the development and implementation of tailored prevention efforts. Just as vital as these capabilities is a program's capacity to engage its partners and communities by disseminating these data in a timely and consistent way, such as via web-based dashboards or quarterly reports.

Each state implemented a wide array of trainings targeted toward various professional audiences such as health care providers, pharmacists, other health service professionals, law enforcement officers, and first responders. Training topics included education on addiction and stigma reduction, prevention and treatment information and resources, and access to and use of naloxone.

States also recognized the crucial role of treatment infrastructure (ie, the supplies, staff members, and systems necessary to deliver treatment) in overdose prevention and response and were, therefore, engaged in improving health care delivery systems. Activities centered on 2 primary goals: (1) reducing barriers to treatment, with an increased focus on screenings, and (2) increasing treatment workforce capacity, as indicated by how many health care providers can prescribe medications for opioid use disorder.

The crucial role of harm reduction, including naloxone access and distribution, in combating overdose was another common theme across all 4 program narratives. States also engaged in harm reduction activities such as syringe services programs.

### **Additional Elements to Drug Overdose Prevention**

Although each state acknowledged that the need to focus on populations with unique needs may have implications for program implementation, the focus of such implementation efforts differed. States described efforts to focus on populations such as rural communities, pregnant women, people experiencing homelessness, racial/ethnic minority groups (eg, tribal, Hispanic populations), and young people. Program narratives in all 4 states documented a focus on justice-involved populations with activities such as prearrest/pretrial diversion programs, drug courts, access to medications for opioid use disorder in jails and prisons, and postrelease linkage to care and continuing treatment supports.

Similarly, all 4 states also described public awareness campaigns and/or hotlines for accessing treatment resources. However, innovation expanding on these ideas focused on other community factors and outreach opportunities, such as school-based prevention programs, adverse childhood experiences, and neonatal abstinence syndrome.

All 4 states described systems that facilitate linkage to care and treatment. Each state used a different model, but all 4 states shared the goal of establishing linkages to evidence-based treatment and recovery services. These models go beyond traditional support programs (eg, 12-step programs) by coordinating entry into services or treatment for people with substance use disorders and other co-occurring conditions (eg, hub-and-spoke model in New Hampshire, medication therapy management model in Massachusetts, core service agencies in New Mexico). Lastly, New Mexico and Massachusetts used peer support and recovery coaches to improve patient engagement in long-term recovery from substance use disorder.

### **Discussion**

Providing insight into the core elements of overdose prevention programs can help states consider new policies, partnerships, and activities that may enhance their programs.<sup>6</sup> Our thematic analysis found that comprehensive policies, timely dissemination of key data, and building capacity through training, treatment infrastructure, and harm reduction activities were common prevention approaches taken by 4 states in which opioid-involved overdose death rates decreased from 2016 to 2017. Although much of the literature on effective overdose prevention has focused on the effect of a specific activity, such as PDMP enhancements or trainings, this focus on a single activity is inconsistent with how programs are implemented in practice. The core elements we identified were implemented by jurisdictions using a whole-program or holistic approach, in which activities were intended to work synergistically to achieve programmatic successes. Thus, we will focus our discussion on key public health

implications revealed by our holistic examination of 4 states' overdose prevention and response efforts.

An important implication for public health practitioners implementing similar overdose prevention programs is to adopt a holistic view of both the individuals they are trying to reach with their programming and the conditions they are trying to prevent. Our thematic analysis found that prevention activities were tailored to the context and drivers of the opioid epidemic in a particular jurisdiction, including focusing on the needs of populations disproportionately affected by overdose. Overdose fatality reviews<sup>7,8</sup> are an important example of convening multisectoral partners to generate and then act on context-specific data to inform program implementation and systems-level change. Local engagement, a core element identified by this analysis, is also an example that underscores the importance of context-specific adaptation.

Many of the core elements identified by this analysis were anchored and enhanced by partnerships and collaborations among various segments of the public health response (eg, mental health services, infectious disease programs) and the public and private sectors (eg, health departments, health care systems). Overdose prevention program implementers may also benefit from expanding existing multisector approaches to include novel partners, such as faith and ethno-linguistic communities, as well as by broadening their notions of local engagement. This approach could help reach diverse populations and address disparities in access to and acceptability of prevention activities, including stigma related to opioid use disorder and people who are experiencing it. Moreover, developing relationships with people who use drugs and people who are in recovery are vital both to understanding the current overdose landscape and to quickly adapting to novel and emerging drug threats.

To continue moving forward the science of overdose prevention, future analyses could seek to attribute changes in program outcomes to specific programmatic activities and policies and to analyze optimal timing and combinations of program activities within the life span of an overdose prevention program. The durability of overdose declines, as well as the programmatic elements of other state programs that experience declines in the future, should also be examined. The programmatic activities highlighted in this analysis are likely to be relevant to other drug classes that are increasingly being implicated in overdose deaths (such as stimulants) and polysubstance use; however, more research is needed to confirm this hypothesis.

### Limitations

This study had several limitations. First, it cannot be ascertained in this analysis which of the described program activities, if any, were associated with the mortality declines experienced by the 4 states analyzed. Other states that did not see a decline in rates of opioid-involved overdose deaths

may have implemented similar activities. Future studies should compare activities implemented in states showing reductions in the rates of opioid-involved overdose deaths with states not showing reductions to identify which activities may have the greatest impact. Further analysis and evaluation of programs and program implementation are needed to continue building the evidence base for overdose prevention.

Second, variability may have occurred across states in terms of whether death certificates provide information about the involvement of certain drugs (eg, opioids). Fluctuations in the availability of death certificate data on drug involvement in a given state during the study period would contribute to observed increases or decreases in rates of opioid-involved overdose mortality. It was confirmed that the 4 states we examined had maintained consistently available documentation of specific drug involvement on death certificates during 2016 and 2017, meaning fluctuations in observed opioid-involved overdose mortality rates were not solely the result of postmortem testing capacity.

Third, our thematic analysis was limited to programmatic elements provided in the program narratives for the 4 states. Although steps were taken to ensure comprehensiveness, the program narratives presented in this analysis may not be complete because many organizations are active in overdose prevention efforts, but our study focused on collaborating with state government partners. In gathering information from state partners to complete program narratives, no cut-offs for completed implementation were specified, meaning that each program narrative may cover a slightly different time period. In addition, given the differences in state structure, geography, population, and other social factors among the 4 states, the degree to which similar activities were implemented likely varied. Additional evaluation is needed to determine the implementation fidelity of the programmatic activities described for each state.

Finally, we allowed state partners flexibility in the time frame of activities being discussed. For example, case studies may have included policies or programmatic activities that were enacted before 2016 but were believed by state partners to affect 2016-2017 overdose measures, resulting in varying periods contributing to the case studies in the 4 states examined.

### Conclusions

The opioid overdose epidemic is a major public health issue in the United States that requires critical response efforts at the state and local levels. Our analysis identified comprehensive state policies, strategic planning efforts, local engagement, data collection and dissemination, targeted training for professional audiences, treatment infrastructure, and harm reduction as core elements of overdose programs in states that experienced a decline in the rate of opioid-involved

overdose deaths from 2016 to 2017. Our analysis indicates that these elements may contribute to successful overdose prevention and response.

Our findings have implications for overdose programs seeking to learn from the success of the states profiled, namely, the importance of the core elements and the context-specific adaptations of evidence-based prevention strategies, particularly with respect to disproportionately affected populations, and the importance of interdisciplinary partnerships and collaboration. Further evaluation of these state programs and other successful overdose prevention efforts through robust and rigorous evaluation research can help guide states as they strive to prevent overdose. These evaluations will be critical as the drug overdose epidemic continues to evolve or as new drug threats emerge.

### Disclaimer

The findings and conclusions in this article are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

### Acknowledgments

The authors acknowledge all those in federal, state, and local governments; nongovernment and community-based organizations; and research entities engaged in reducing overdose and overdose-related harms. Their work makes the programs described in this article possible.

### Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

### Funding

The authors disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: Massachusetts, New Mexico, and Utah received funding through both CDC-RFA-CE15-1501 and CDC-RFA-CE16-1608. New Hampshire received funding via CDC-RFA-CE16-1608.

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### Supplemental Material

Supplemental material for this article is available online.

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