

Concepts in Disaster Medicine

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Abbreviations:

CDC, Centers for Disease Control and Prevention; COVID-19, Coronavirus Disease; CReDO, Community-based Response to Drug Overdose; CTM, Counter-Terrorism Medicine; DM, Disaster Medicine; ED, Emergency Department; EMS, Emergency Medical Services; NFPA, National Fire Protection Association; SARS-CoV-2, Severe Acute Respiratory Syndrome Coronavirus 2

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Combating the Opioid Crisis and Its National Security Threat Through CReDO: A Multidisciplinary Solution With Disaster Medicine Implications

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Abstract

For the first time in history, the United States surpassed 100 000 overdose-related deaths in a 12-month period, driven by synthetic opioids such as fentanyl. Also, for the first time, potential chemical weapons are readily available on the streets and the dark web. Opioids represent a rare tripartite, used for licit pain management, as an illicit drug of abuse, and with potential use as a weapon of terror. Community-based Response to Drug Overdose (CReDO) is an initiative to unite agencies, disciplines, government, and private partners in 1 coordinated opioid emergencies response plan under nationwide standards, and can be integrated into the disaster medicine discipline due to the risk of mass casualty incidents involving fentanyl or its derivatives. Attention to the opioid crisis through CReDO will save lives by promoting information sharing between disciplines, shortened response time to overdose clusters, community collaboration to identify criminal distribution networks, and holistic approaches to addiction.

The US Opioid Crisis: A Public Health Emergency

The US drug overdose crisis reached a tragic landmark in December 2021, surpassing 100 000 deaths in a 12-month period for the first time in history.¹ The height of the SARS-CoV-2 (COVID-19) pandemic saw an acceleration in overdose-related deaths largely attributed to the growing use of synthetic opioids such as illicitly manufactured fentanyl,² which accounted for 66% of overdose deaths in 2021.¹ Of particular concern is the rise of overdose-related mortality in American youth; death due to unintentional drug overdose accounted for an all-time high of 84 179 adolescent years of life lost (a measure of premature mortality accounting for age at death, in addition to frequency of deaths) in 2020, fueled by synthetic opioids.³ Fentanyl has 100 times the potency of morphine and rapid onset capabilities.⁴ In addition, counterfeit pills containing fentanyl can be made to look identical to the authentic prescription medication and can therefore be used by the victim unknowingly.⁵

The current US government administration has proposed several goals to combat this public health emergency, including increasing availability of harm reduction services and treatment such as distribution of naloxone and expanding buprenorphine access, raising awareness on the dangers of fentanyl, disruption of drug trafficking, and classification of fentanyl-related substances as Schedule I under the Controlled Substances Act to allow law enforcement to respond to illicitly manufactured synthetic opioids.⁶

This article introduces the framework for a novel response to the opioid crisis, a Community-based Response to Drug Overdose (CReDO). In addition to its public health implications, there has been a growing recognition that opioids present a national security threat. The prevalence of synthetic opioids and its security implications suggest that CReDO should be incorporated into the disaster medicine (DM) discipline and counter-terrorism medicine (CTM) sub-specialty.

Discussion

The Opioid Trifecta

Opioids represent a rare trifecta as a class of drugs. They are a commonly used pharmaceutical therapeutic for effective, *licit pain management*. Opioids are also an easily trafficked *illicit drug of abuse*. Illicit opioids sold in the United States are primarily sourced from China and Mexico, entering the country through smuggling across the southwest border or via international mail services or consignment shipping. Unlike heroin that requires plant material, illicit fentanyl can be produced entirely through chemicals in a laboratory. Traffickers can generate significant revenue with little investment, as a single kilogram of fentanyl powder can create hundreds of thousands of counterfeit pills.⁵

While unintentional overdoses resulting from the opioid epidemic are the leading cause of drug-related death, there has also been discussion even on the congressional level about the potential use of opioids as a *weapon of mass destruction*.^{7,8}

Community-Based Response to Drug Overdose (CReDO)

There have recently been numerous outbreaks of illicit narcotics contaminated with non-pharmaceutical fentanyl powders packaged as pills or liquids, containing fentanyl levels so high that ingestion of even 1 pill has caused fatalities. In addition to causing numerous deaths, an outbreak in California in 2016 overwhelmed the emergency department (ED) and intensive care unit capabilities of the local tertiary care hospital, limiting their ability to accept transfers, and depleting the hospital's antidote (naloxone) supply, requiring emergency sourcing of naloxone. An analysis of this case highlights the difficulty in securing immediate coordination of the many agencies required to address this health emergency, such as public health organizations, local hospitals, emergency response units, law enforcement, coroners, poison control centers, and federal resources.⁹

In examining prior narcotic outbreaks and current government goals, a successful response to this crisis requires an integrated approach. In response to the overdose crisis, this article proposes a Community-based Response to Drug Overdose (CReDO), an initiative to unite all agencies, disciplines, government, and private partners in 1 coordinated opioid emergencies response plan under the creation of a nationwide set of standards. The foundation of CReDO is its "whole-of-community" approach. CReDO seeks to integrate responses across disciplines, including health care, law enforcement, medical examiners, fire and emergency medical services (EMS), social agencies, addiction management agencies, family services agencies, public health, the business community, and public works, as well as align federal efforts with local, state, and private sector partners.

The foundation of CReDO's multidisciplinary, whole-of-community approach is supported by current initiatives and studies. An article by Morrow et al. documenting external perspectives from stakeholders within industry, government, and academia on novel synthetic opioid surveillance and testing related to National Institute of Standards and Technology standards and processes concluded that a multidisciplinary holistic response to the opioid crisis was needed and proposed a national syndromic surveillance system similar to programs currently used for biological threats.¹⁰ Success in combined public health and law enforcement efforts to analytically characterize novel synthetic opioids and provide toxicology testing has been demonstrated at the jurisdictional level, utilizing real-time surveillance data to assist

intervention in cases of clusters or spikes in overdoses.¹⁰ Strategies to improve opioid overdose surveillance by linking 2 traditionally siloed data systems look to be a promising aid to response efforts.¹¹ A study in Massachusetts described successful linkage of EMS and ED data from opioid overdoses,¹² whereas another study in North Carolina linked ED data with naloxone administration in EMS transports.¹³

A rapid, effective response to emerging opioid threats requires a multidisciplinary approach based on real-time data sourced from different agencies spanning from the community through the federal level. An accurate assessment of the current state of the opioid epidemic could be determined from real-time geographic tracking of drug overdose cases and clusters, prompt drug detection and compound identification, potency and toxicology testing, and information on drug-related material seized by law enforcement.¹⁰ This information is currently siloed, existing in disparate databases that remain accessible to only a specific agency or discipline.¹⁰ An integrated database and response system benefits all involved parties, whose goals are ultimately interdependent. EMS data on opioid-related encounters and opioid-related deaths determined by medical examiners yield improved drug surveillance and community awareness and can guide law enforcement efforts and improve patient treatment in the ED. Identification of novel synthetic opioids and data on toxicity and potency are important for government response to the agent and criminal prosecution. Law enforcement data on drug seizures and opioid-related criminal activity inform patient treatment by EMS and ED providers.

The CReDO set of standards would be developed using an industry-driven national accredited approach such as the National Fire Protection Association (NFPA) standards development process. A multidisciplinary technical committee, including representatives from all involved disciplines and a diverse representation of agencies, would take an integrated approach to developing the set of standards. The committee would operate on expert consensus-driven initiatives, with selection of the technical committee led by the standards setting organization. If CReDO were established using the NFPA standards development process, the technical committee would be selected following the traditional NFPA standards development process. NFPA selection of a technical committee is based on individual qualifications as well as a balance of interest categories.¹⁴ Given the multidisciplinary nature of CReDO, the balance of interest categories within the technical committee would need to include members of health care, public health, law enforcement, EMS, social services, and addiction specialists. CReDO would be established as a non-profit organization, with funding sources through donations, fundraising, and grant funding. Standards would focus on (1) identifying restrictions preventing effective information-sharing across critical prevention and response disciplines; (2) promoting timely recognition of overdoses, novel analogs, and deadly mixtures; (3) shortening response time to overdose clusters; (4) developing collaboration across communities necessary to identify criminal distribution networks; and (5) creating community-led holistic approaches to addiction and overdose management.

A similar standards development process was utilized in NFPA 3000, Standard for an Active Shooter/Hostile Event Response, demonstrating the feasibility of such an approach. NFPA 3000 was developed by a multiagency committee representing 46 different agencies, associations, and organizations. This standard was created with multidisciplinary support from EMS, law enforcement, fire service, emergency management, facility management,

and higher education. As with CReDO, the overarching concepts of integrated response and whole community involvement are a critical piece of the design. NFPA 3000 provides guidance to communities seeking to combat active shooter or hostile events, by unifying all community stakeholders in a joint effort that addresses multiple aspects of the disaster cycle: prevention, response, and recovery.¹⁵

CreDO has already been trialed on a smaller level with great success. As an operational example, the San Diego CreDO Task Force provides a coordinated response to fentanyl overdoses by bringing together public health, prevention forces, and public safety, working closely with the district attorney's office and EMS. The task force has seen multiple successes, including the creation of a multidisciplinary overdose team incorporating both crisis intervention and law enforcement that has proven capable of tracing an overdose cluster and intervening to remove deadly counterfeit pills. Through an educational campaign, the task force also successfully increased fentanyl testing capability of San Diego hospitals by 70%.¹⁶ This new community standard of care was the precursor to SB-864 Tyler's Law, which now requires all emergency departments in the state of California to include fentanyl testing for any patient when a standard drug screen is ordered.^{17,18}

Implications for Disaster Medicine

Due to the abundance and easy accessibility of fentanyl and its derivatives as a result of the opioid crisis, CReDO must be integrated into the framework of DM, the study of preparedness, response, recovery, and mitigation (the disaster cycle) for events that overwhelm the resources of an existing community.¹⁹ CReDO's multidisciplinary approach, spanning various agencies at state, local, and governmental levels, aligns well with the tenets upon which DM was built. The goals of CReDO span the disaster cycle, addressing not only the acute response phase to the overdose cluster, but also incorporating an extensive network of multidisciplinary preparedness and mitigation assets to address the underlying issues of addiction and abuse, as well as community recovery. It is designed to catalyze the collaboration necessary for effective recognition of clusters within a community and drive efficient, meaningful response partnerships that bolster resilience and reliability within the community for all hazards.

CReDO offers a novel approach to several phases of the disaster cycle, based on multidisciplinary and multiagency collaboration that starts at the community level. Within the preparedness phase, 1 focus of CReDO is improving communication by identifying and alleviating the communication barriers that currently impede information-sharing across a community's response and prevention disciplines. Restrictions that prevent effective communication of critical information such as sensitive information from law enforcement, on scene Hazmat analysis, protected health information within the medical community, reports from medical examiners and chemical forensics, and social services records need to be identified and addressed. Under CReDO, such data would be integrated into a large-scale national database vetted by subject matter experts, enabling real-time identification of overdose clusters that could be used to guide response. Subject matter experts responsible for vetting the national database can be identified by the technical committee established by the standards setting process and can represent a range of disciplines. Data originating from a particular discipline can be screened by an expert from that same discipline. Data pertaining to the discovery of novel fentanyl analogs and areas of high-intensity drug

trafficking, for example, can be vetted by experts from the law enforcement community.

Widespread fentanyl testing in hospitals would allow for improved surveillance. Interdisciplinary cooperation and enhanced surveillance would improve identification of nefarious activity within a community and aid government and law enforcement efforts to stop illicit drug trafficking. CReDO's approach to preparedness also includes nationally coordinated training for first responders, with programs built through collaboration of experienced organizations with existing training courses. Such training programs would review drug fact sheets and common questions related to fentanyl, personal protective equipment protocols, and guidance for non-medical first responders prior to EMS arrival. Nationally coordinated training would be directed by the Office of National Drug Control Policy. Addressing underlying issues of addiction and abuse would include community monitoring of the efficacy of CReDO in the reduction of opioid-related deaths by public health experts.

In the response phase of the disaster cycle, CReDO would use an integrated alert system for opioid overdose clusters and opioid-related national security threats identified by its surveillance database and validated by subject matter experts, allowing for streamlined communication between agencies and disciplines. Response plans incorporating all community stakeholders could then be activated, allowing for coordinated response from agencies across multiple disciplines. A standardized approach to unknown powders and opioid detection methods would be utilized, guiding first responder handling of the product at the scene as well as establishing specific technology to use in drug identification. With the aid of academic organizations capable of producing educational content rapidly, just-in-time training would be created in real time to address novel emerging threats.

Within the field of DM, a sub-specialty known as counterterrorism medicine (CTM) has recently emerged. CTM applies the same disaster cycle focus to intentional attacks that have a significant impact on health care.²⁰ CTM also addresses unusual modalities intended to maximize casualties, such as chemical warfare agents that result in unique, high-acuity injury patterns.²⁰ As CReDO recognizes opioids as a potential chemical weapon and aims to improve mitigation, preparedness, and response capabilities in the case of such an attack, this project aligns well with the CTM sub-specialty.

The easy accessibility to large quantities, potency, variety of intentional exposure routes, and large amount of antidote required to treat an outbreak make opioids an ideal weapon of terror.²¹ Coupling this with the increasing affordability and ease of drug transport and distribution that the growing opioid epidemic has created makes opioid agents appealing further as a chemical-warfare agent for civilian attack. It follows that opioid prevalence and terrorism are conceptually linked. This linkage suggests that it would be beneficial to include several relevant existing federal agencies in the establishment of CReDO, such as the Department of Homeland Security, Administration for Strategic Preparedness and Response, Department of Health and Human Services, Office of National Drug Control Policy, and Centers for Disease Control and Prevention. CReDO would also incorporate several existing databases, most importantly the Overdose Detection Mapping Application Program maintained by the Washington/Baltimore High Intensity Drug Trafficking Areas, which reports overdose surveillance data in near real-time across jurisdictions.²²

In 2016, Canadian officials seized 1 kilogram of carfentanil in Vancouver, purchased directly from China and concealed in a box declared to be printer materials. With a lethal dose being

approximately 20 micrograms, that amount of carfentanil could kill 50 million people, the entire population of Canada.²³ Carfentanil, the use of which has been increasing in recent years, has 100 times the potency of fentanyl.⁵ Fentanyl and fentanyl analogs can be dissolved and disseminated in aerosolized form, posing significant risk to first responders as well as an unsuspecting population.⁷ It has been suggested that a mass casualty incident could be caused by the release of an opioid-based chemical weapon via drone repurposing,²¹ amongst other modalities.

The notion of using opioids as a chemical weapon has been explored by several military groups throughout recent history. In 2002, when Chechen rebels seized a theater in Moscow and held over 800 people hostage, Russian security forces introduced a combination of aerosolized fentanyl analogs into the building to incapacitate the theater inhabitants, killing most of the rebels and over 120 hostages in the process.^{7,24} In 1997, Israeli Mossad agents sprayed a modified fentanyl into Hamas leader Khaled Mashal's ear in an assassination attempt.^{25,26} The US Department of Defense also investigated fentanyl as a military chemical weapon but terminated the program, recognizing difficulty with the margin of safety (the difference between the lethal and incapacitating dose).⁷

While legislation in the United States has been slow to recognize opioids as a weapon of mass destruction, this idea has been present in academia for some time. In 2018, an article in the *New England Journal of Medicine* identified opioid agents as one of the classes of chemical-warfare agents likely to be used in a civilian attack.²⁷ Opioids, like illicit fentanyl and its derivatives, are far easier to obtain and use than many traditional chemical-warfare agents such as sarin, yet are capable of producing a similar degree of morbidity and mortality. To better understand the gravity of the potential use of opioids as chemical-warfare agents, when speaking of the opioid crisis one may simply substitute the word *fentanyl* or *carfentanil* with *nerve agent*, and the threat becomes immediately apparent. Framing the opioid epidemic within the context of CTM has the potential to generate more effective policies to combat this growing threat. A key component of this policy would be naming illicit fentanyl as a weapon of mass destruction. Designation as a weapon of mass destruction would allow for coordination between relevant US federal agencies such as the Department of Homeland Security, Department of Justice, Department of Defense, and the Drug Enforcement Administration in international interdiction efforts to stop the fentanyl supply chain at its source and prosecute those involved in manufacturing and distribution, as well as authorize an increase in federal sanctions.^{28,29}

The proposed multidisciplinary technical committee of CReDO allows for integrated community planning for risk mitigation, which could include standards regarding naloxone distribution and stockpiling. It also facilitates the interagency collaboration necessary to create an integrated alert system for streamlined communication and allow for a coordinated response in the event of a chemical weapons attack.

Limitation

As CReDO represents a novel approach to the disaster cycle that has not yet been implemented on a large scale, research that is applicable to this concept is limited.

Conclusion

Attention to the opioid crisis through the development of CReDO will promote information-sharing between disciplines, shorten the response time to opioid overdose clusters, develop community

collaboration necessary to identify criminal distribution networks, and allow communities to develop holistic approaches to combating opioid addiction and overdose. This will improve public health by creating a multidisciplinary response to the opioid crisis that will ultimately decrease the death toll associated with this public health emergency through early identification of overdose clusters and effective integration of agencies. The prevalence of illicit opioids and their security implications suggest that CReDO should be integrated into the disciplines of disaster medicine and counter-terrorism medicine.

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