

PROGRAM DESCRIPTION

Overdose Response Training and Naloxone Distribution Among Rural First Responders

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In the midst of the overdose crisis, knowledge of overdose education and administration of naloxone, the opioid-overdose antidote, must expand outside emergency medical services (EMS)-based first responders, particularly in rural communities where police and fire departments often may arrive first on the scene to an overdose. Missouri has implemented a novel train-the-trainer model to increase the diffusion of overdose education and naloxone distribution to non-EMS first responders in rural communities. Training content was specifically developed to address first responders' fears and reservations related to overdose response, which include but are not limited to personal risk of overdose from fentanyl exposure, belief in addiction as a moral failing, and lack of knowledge and resources to respond effectively to an overdose. Further, trainings also focused on the diffusion of naloxone-related legislation (i.e., Good Samaritan Laws, standing orders for naloxone) in Missouri to increase first responder awareness of relevant policies. Partnerships with local public health agencies allowed them to serve as hubs for naloxone distribution. This article describes the development and implementation of this project with the goal of promoting national replication to increase overdose education and access to naloxone for first responders in rural communities.

Public Health Significance Statement

The opioid-overdose crisis is a critical public health concern. This manuscript describes an innovative overdose prevention program for predominantly rural first responders including the large-scale implementation of training and naloxone (i.e., the opioid-overdose antidote) distribution efforts with the goal of promoting successful replication.

Keywords: opioids, overdose education, naloxone, train-the-trainer, professional first responders

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Drug overdose rates have been increasing in both rural and urban counties since 1999 (Hedegaard et al., 2019), and in 2017, there were approximately 70,237 opioid-overdose deaths in the United States, in large part due to the presence of illicitly made fentanyl (Centers for Disease Control and Prevention, 2016). Urgent action is needed to decrease the overdose mortality rate through the provision of naloxone, an opioid antagonist that can be administered via nasal spray or intramuscular injection to reverse an opioid overdose in under 2 min. Naloxone has become increasingly available in urban areas, but there has been a lack of diffusion of this life-saving medication in rural areas (Centers for Disease Control and Prevention, 2019). Approximately 60 million individuals live in rural areas in the United States (Ratcliffe et al., 2016), and as noted by Rigg et al. (2018), although the mortality rate may be lower in rural areas than urban areas, socioeconomic, social, and infrastructural challenges unique to rural communities require innovative approaches to addressing the opioid-overdose crisis.

Paramedics have been carrying naloxone for decades; however, other first responders (e.g., law enforcement officers and firefighters) who may arrive first to the scene of an overdose, especially in rural areas of the U.S. (Corso & Townley, 2016), have not traditionally been equipped with naloxone, nor explicitly permitted by law to administer it (Davis & Carr, 2015). Response times for opioid overdoses are crucial in reducing the risk of fatality (Davis et al., 2015), and even more pressing given the presence of fentanyl in the drug supply (Ciccarone, 2017). In addition to professional first responders (PFRs), efforts are needed to expand access to naloxone to any individual who may witness an overdose and include social service providers, people who use drugs (PWUDs), and friends and family of PWUDs. A recent cost-effectiveness analysis estimated that high distribution of naloxone to a combination of laypersons, law enforcement officers, firefighters, and emergency medical services (EMS) was not only the most cost-effective approach but the approach with the greatest life-saving likelihood: It could avert approximately 21% of overdose deaths (Townsend et al., 2020). Rural communities and the broader Midwest region have the lowest naloxone prescription rates nationally (Guy et al., 2019), and community-based harm reduction, outreach, and syringe

service programs are sparse (North American Syringe Exchange Network, 2019). Therefore, PFRs play a crucial role in overdose reversals until community saturation of naloxone is reached.

In 2014, Missouri enacted a state statute (RSMO 190.255 (House Bill, 2040), 2014) that enabled law enforcement officers and other non-paramedic first responders (e.g., emergency medicine technicians or EMTs, firefighters) to carry and administer naloxone. Though the enactment of this legislation was a critical step for naloxone-related policy in Missouri, a majority of emergency response agencies were neither trained to respond to opioid overdoses nor equipped with naloxone at the time the statute went into effect, limiting its practical implications. In 2017, naloxone access was expanded through a statewide standing order issued by the Director of the Missouri Department of Health and Senior Services. The specific language permits members of the general public to possess and carry without a prescription and administer naloxone in good faith without risk of arrest or prosecution (RSMO 195.206 (Senate Bill 501), 2017). Pharmacies have since been allowed to dispense naloxone under this standing order to individuals without a prescription; however, uptake has been slow, particularly in rural areas.

As of 2019, Missouri's state budget did not allocate any General Revenue funds toward naloxone (The Missouri Budget, 2019); therefore, like many states, distribution relies heavily on one-time federal grant funds. Nationally, the primary source of funding to combat the opioid-overdose crisis has been through the passing of the 21st Century Cures Act, through which the Substance Abuse and Mental Health Services Administration (SAMHSA) awarded each state and U.S. territory the State Targeted and State Opioid Response Grants (Opioid STR and SOR, respectively). In addition to these large-scale, comprehensive prevention-, treatment-, and recovery-focused grants, a number of other funding streams through SAMHSA, Health Resources and Services Administration, and the Bureau of Justice Assistance provided funds to states and local organizations and governments for implementation of programs to address the opioid-overdose crisis including training and equipping responders with naloxone. Alongside the Opioid STR and SOR grants, of which a component involves overdose prevention and naloxone

distribution, Missouri was also awarded two statewide, SAMHSA-funded grants: The Prescription Drug Overdose grant (i.e., Missouri Opioid-Heroin Overdose Prevention and Education; MO-HOPE Project), and the First Responders-Comprehensive Addiction Recovery Act grant (FR-CARA), which solely focus on overdose response training and naloxone distribution.

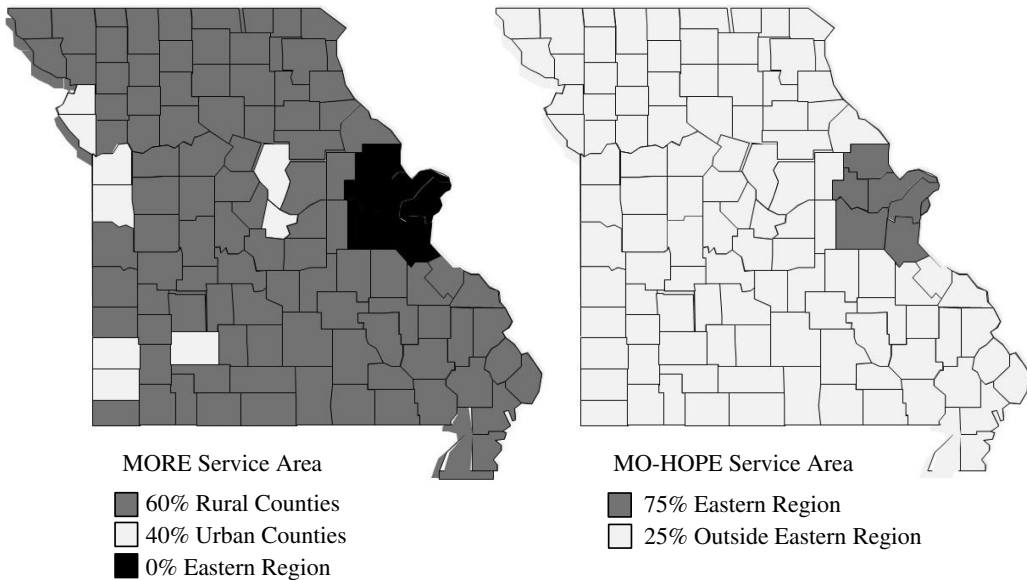
The majority of grant funding for overdose response training and naloxone distribution in Missouri targeted populations within the predominantly urban Eastern region of the state, primarily due to the regions' high rates of overdose deaths and its position as the epicenter of the opioid-overdose crisis in the state. Specifically, the MO-HOPE Project focused 75% of its naloxone supply on seven counties in the Eastern region with a population of 2,142,303 and an overdose death rate of 29.97 per 100,000 (Missouri Bureau of Vital Statistics, 2018). MO-HOPE focused on providing overdose response training and naloxone to first responders

in the Eastern region as well as general audiences, treatment providers, and other social service providers statewide. However, many Missouri residents reside in rural areas (Parker, 2017), and at the time of initiation of the current project, there was still a significant gap in the dissemination of training resources and naloxone, particularly to first responders in rural parts of the state.

The Missouri Overdose Rescue and Education (MORE) project, administered by the Missouri Department of Health and Senior Services (DHSS) and funded by SAMHSA through the FR-CARA mechanism, was designed to address the gaps in the availability of naloxone and overdose response training in Missouri, with specific emphasis (at least 60% of grant funds) on rural areas. Figure 1 depicts the geographic catchment areas of the MORE and MO-HOPE projects in Missouri. Relative to the catchment area of the MO-HOPE project, the MORE project encompasses 107 counties with a population of 3,966,309 and an overdose death rate of 7.77 per

Figure 1

MORE and MO-HOPE Catchment Area: Proposed Proportion of Grant Funds Dedicated in Target Areas



Note. The MORE and MO-HOPE projects used different criteria to define a service area. The MORE grant used the Missouri Department of Health and Senior Services designation of urban and rural counties, whereas the MO-HOPE project designated a high-need region rather than prioritizing a service area based on a rural/urban designation. Because the MO-HOPE project provided overdose education and distributed naloxone to first responders among other audiences in the Eastern region, the MORE project did not serve this area. Outside of the Eastern region, the MO-HOPE project predominantly trained and provided naloxone to service providers and other nonfirst responders.

100,000 in 2017 (Missouri Bureau of Vital Statistics, 2018). Despite evidencing a lower rate of overdose death, the predominantly rural MORE catchment area was underresourced and less well equipped to respond to overdoses, relative to urban areas in Missouri. This article describes the innovative approach to expand overdose education and naloxone distribution (OEND) to PFRs (i.e., law enforcement and fire personnel) in rural areas so that similar models may be replicated and improved upon in other rural areas of the country.

Program Implementation

Building Front-End Infrastructure

Once the MORE project was funded, strong working relationships with existing programs already providing the same OEND training were crucial in developing a smooth referral process for training and naloxone requests. The MORE Project Director collaborated with staff on the MO-HOPE Project to ensure trainings in the Eastern region of the state were handled by MO-HOPE, whereas trainings for rural PFRs were handled by MORE. The MORE grant staff also joined an existing MO-HOPE Advisory Council and broadened membership to include stakeholders in rural Missouri. The goal of the Advisory Council is to bring stakeholders together from across the state to inform grant initiatives, and includes PFRs, public health researchers, people in recovery from substance use disorders, and people who have lost a family member to a drug overdose. As many EMS entities are medically trained, already carry naloxone and are familiar with overdose rescue and response, outreach efforts focused on identifying non-EMS-based PFR agencies to be trained and equipped with naloxone.

Training Implementation and Dissemination

Train-the-trainer models can reach isolated areas and take into account the local context from the communities being trained (Rajapaske et al., 2013; Zisblatt et al., 2017). To both disseminate training content in rural areas and incorporate “expert” trainers whose knowledge and experience would resonate with first responders, the MORE project implemented a

“train-the-trainer” dissemination model for the training curriculum during the first 2 grant years, contracting with seven EMS agencies to provide regional OEND trainings in and around their local jurisdictions. Among the 7 EMS agencies, 24 paramedic trainers volunteered to serve as trainers for the MORE program. A majority of trainers were male (63%), and almost all were White. Trainers were on average 41 years old.

The goal of this regional train-the-trainer structure was to train select agency representatives who would be responsible for training the remaining responders at their respective agencies. There was no requirement that agencies follow this training structure, so in some instances, the contracted EMS trainers trained an entire agency rather than a few select representatives (i.e., they skipped the train-the-trainer step and went straight to direct training delivery). Although EMS trainers were heavily utilized in the first year of the grant, toward the end of the second year, a greater percentage of trainings were conducted by first responders who attended one of the EMS-led train-the-trainer trainings, suggesting the train-the-trainer model was used as intended. The result was a sharp increase in the number of individuals trained between Years 1 and 2 due to the increased diffusion and dissemination of the training (Table 1).

To increase the sustainability and long-term fidelity of the training content, an online training was developed and implemented toward the end of the second grant year. Online OEND trainings in other parts of the United States have shown promising results in increasing participants’ overdose-related knowledge and confidence administering naloxone (Simmons et al., 2016). Although in-person trainings are ideal for combating stigma and reservations toward naloxone because they enable facilitated discussions with experts (Arredondo et al., 2019), there are a number of benefits to a shift toward an online training. The online training not only addressed the barrier of individual trainers needing to travel throughout their region (up to approximately 300 miles and a 3-hr drive roundtrip), but also addressed the administrative barrier of agencies scheduling and coordinating training dates for their officers. The online training provided individuals the opportunity to complete sections independently and on their own time without having to commit to a full 3-hr in-person session. The deployment of the online training, however, has resulted in decreased

Table 1*Missouri Overdose Rescue and Education Numbers Trained and Naloxone Distribution by Year and Cumulative Totals*

	Year 1	Year 2	Cumulative total ^a
Total trained	1,553	2,949	4,502
Individuals trained by EMS	710	491	1,201
Individuals trained in-person, not by EMS	843	2,035	2,878
Individuals trained online ^b	0	423	423
Naloxone kits distributed	3,183	9,720	12,903
Agencies equipped with naloxone ^c	63	181	197
Law enforcement agencies	35	94	103
Fire departments	24	73	80
Other	4	14	14

Note. EMS = emergency medical services.

^a Of the 107 Missouri counties included in the MORE catchment area, individuals from 99 counties have been trained and agencies in 78 counties have begun carrying naloxone. ^b The online training was launched in July of 2019, so the year 2 numbers represent individuals trained during the approximately 3-month window when the training was live and accessible. ^c Agencies supplied with naloxone are duplicated across years. The cumulative total is the unduplicated total of agencies equipped with naloxone.

participation of in-person trainings and increased utilization of the online curriculum. Following both the in-person and online trainings, participants receive a certificate of completion.

Training Content

The base training built on the previous curriculum developed by the MO-HOPE team members and was designed for any PFR who arrives on the scene of an opioid overdose. The curriculum was developed in collaboration with a clinical psychologist, an Emergency Medicine physician, and public health staff and researchers, with critical input provided by local harm reduction outreach workers and advocates. The act of teaching first responders to recognize and reverse an overdose with naloxone is extremely simple and alone would take less than 15 min. However, in addition to expanding first responders' knowledge and ability to respond to overdose events, the training content detailed below aimed to assuage concerns related to responder safety and liability and improve attitudes and interactions with people who overdose.

Training Content Focus Areas¹

1. *Nonstigmatizing and person-first language.* Language to reduce stigma was a key underpinning of the curriculum. Trainers modeled nonstigmatizing and

person-first language throughout the delivery of the curriculum, and specific examples were explicitly covered to demonstrate positive interactions with people who have overdosed. Research has shown that individuals who experience stigma related to their drug use are less likely to seek treatment; however, using person-first language can help decrease negative bias toward individuals (Ashford et al., 2019). For example, the term “person with a substance use disorder” elicits a more positive response than “substance abuser or addict” because it puts emphasis on the value of an individual over their substance use.

2. *Overview of the opioid-overdose landscape: Nationally, in Missouri, and regionally.* Based on anecdotal reports from outreach efforts in which the relevance of overdose education and naloxone for first responders was called in to question, training content was developed to demonstrate the impact of the opioid crisis. Resistance among law enforcement to carry naloxone and participate in our training was often a result of the perception that the opioid-overdose crisis was not a

¹ For the training slides and detailed information on training content, please contact Claire Wood at Claire.wood@mimh.edu

- relevant local issue; therefore, trainers focused on presenting data (e.g., overdose deaths and hospitalizations) specifically regarding the county or jurisdiction in which the responders were employed.
3. *Overdose risk factors and identifying and responding to an opioid overdose.* Perhaps the most critical component of our training was the specific content on identifying and responding to opioid overdoses (i.e., when and how to administer naloxone, provide rescue breaths, etc.). Previous research on OEND trainings implemented with PFRs has demonstrated gains intangible outcomes related to overdose response and naloxone administration (e.g., increased knowledge and competence, reduced concerns) (Kilwein et al., 2019; Wagner et al., 2016). We also addressed first responder concerns related to the risk of behavioral disturbance postoverdose (e.g., aggression or assault) (Marino & Escajeda, 2019), highlighting Missouri and national data demonstrating that behavioral disturbance is rarely an adverse outcome of naloxone administration (Missouri Overdose Field Report, 2019; Wermeling, 2015).
 4. *Risk compensation beliefs.* Scholars have noted that one of the barriers to PFRs engagement in naloxone programs may stem from concerns about risk compensation behaviors, or the belief that the availability of naloxone will lead to decreased fear of dying and therefore increase risky drug-use behaviors (Winograd et al., 2017; Zhang et al., 2018), and have suggested directly addressing this concern in trainings. To address these concerns, our training highlighted the overall societal impact of naloxone distribution in reducing opioid-overdose deaths (Walley et al., 2013).
 5. *Brain-disease model of addiction.* To the extent that first responders view opioid overdose and addiction as a moral failing rather than a chronic condition with biological underpinnings, training content on the Brain-Disease Model of Addiction (BDMA) was incorporated as a way of reducing stigma and negative attitudes toward PWUDs (Leshner, 1997; Volkow, 2018) with the overarching goal of improving interactions between first responders and overdose survivors and their associates during overdose responses.
 6. *Fentanyl myths and facts.* Overdose from airborne or incidental dermal contact with fentanyl has been cited as unlikely in a report from the American College of Medical Technology and American Academy of Clinical Toxicology (2017). However, media outlets have published a number of false stories about first responders overdosing after coming in contact with fentanyl (O’Neill & Wheeler, 2018). These stories, not unlike the fear tactics used to spread myths related to contracting HIV (Piot et al., 2009), may discourage first responders from appropriately and quickly responding to opioid-overdose events. Therefore, the training curriculum highlighted myths and facts about fentanyl exposure and the recommended personal protective equipment to use to dispel fear and encourage participants to respond to overdose events quickly and effectively to save lives, regardless of whether fentanyl is on the scene or not.
 7. *Missouri legislation related to naloxone and interactions with PWUDs.* Good Samaritan legislation, which provides limited immunity against arrest, charge, and prosecution to individuals who call 911 during an overdose event, was only recently passed (in 2017) in Missouri (RSMO 195.205, 2017). As previous research has underscored that first responders, and law enforcement in particular, may be “under-informed, and often ambivalent to public health laws, especially those based in a risk reduction framework” (Banta-Green et al., 2013), our training curriculum highlighted the enactment of this legislation with an emphasis on practical implications (Saucier et al., 2016). Other relevant legislation (e.g., legal protections for first responders administering naloxone) was covered as well.

Training Content Differences

For in-person trainings, trainers used PowerPoint to present the information and were actively encouraged to facilitate conversation among participants. In-person train-the-trainer trainings lasted approximately 3 hr, whereas the online

training was less than 2 hr. Differences in training times were due in part to the additional time required to complete pre- and posttraining assessments during the in-person training. In-person trainings also allowed for built-in time for attendees to practice delivering the content and question and answer periods in which trainers highlighted frequently asked questions and answers to better prepare attendees to serve as future trainers.

Naloxone Distribution

To be eligible to receive naloxone through the MORE project, PFRs must have been trained through either the MORE or MO-HOPE project, or an equivalent, vetted training. After completing the training, a standardized memorandum of understanding (MOU) was executed with first responder agencies. The MOU outlined performance and legal expectations (e.g., hand out treatment resource cards, report overdose reversals into the anonymous reporting system, and establish policies for storing and allocating naloxone). The MOUs did not include a requirement of specific dispatch protocols for overdose response with the assumption that these procedures were already in place within each agency. Due to the size of Missouri and the large catchment area of the MORE grant (i.e., all first responder agencies outside of the Eastern region), it was not feasible for DHSS to directly distribute naloxone to all trained agencies. Therefore, collaborations were established with local public health agencies (LPHAs) to assist with the storage and distribution of naloxone to first responder agencies within their counties. Trained PFR agencies worked collaboratively with the MORE Project Director to determine the amount of naloxone needed, and then naloxone was shipped directly from the naloxone distributor to each LPHA. PFR agencies were then able to pick up their designated allocation and resupply at the LPHA as needed. Staff at LPHAs tracked the numbers of naloxone kits distributed, the agency to which it was distributed, and the date to aid in overall monitoring of naloxone distribution and availability. This innovative distribution model made use of preexisting community and governmental organizations embedded within each Missouri county. LPHAs play a major role in providing health care services to rural communities, more so than in urban areas (Berkowitz, 2004). Of the 107 counties in the MORE

catchment area (excluding the 7 counties primarily served through MO-HOPE), 96 LPHAs participate as a naloxone distribution hub. For the remaining 11 counties, naloxone was distributed by either a neighboring county or the local county EMS agency. Over the first 2 years of program implementation, almost 13,000 intranasal naloxone kits (26,000 doses) were distributed to first responder agencies and almost 200 agencies were equipped with naloxone (Table 1). Of the agencies equipped with naloxone, approximately 52% were law enforcement agencies, 41% were fire departments, and the remainder were various other first responder agencies (e.g., drug task forces, park rangers, and government entities).

Tracking of Nonfatal Overdoses and Naloxone Administrations

With the recent influx of federal grants going toward naloxone distribution, an increasing number of states are developing ways to collect *nonfatal* overdose and naloxone reversal data for enhanced syndromic surveillance and as a way of demonstrating the importance and effectiveness of naloxone in saving lives. Broader surveillance of nonfatal overdoses is imperative for states to be able to identify overdose spikes and target responses with information and resources when and where they are needed (Combating the Opioid Crisis, 2018). In an effort to collect nonfatal opioid overdose and naloxone administration/overdose reversal data in Missouri, a centralized overdose reporting system was utilized (developed in advance by the SAMSHA-funded MO-HOPE Project), which requested every person who experiences, witnesses, or reverses an overdose to enter an anonymous "Overdose Field Report" within the web-based system. The field reports are intended to collect information on nonidentifying characteristics of the individual who overdosed and the overdose event (e.g., zip code, demographic information, relationship of the person who administered naloxone to the overdose victim, and first responder agency affiliation [if applicable]) (For more details, visit mohopeproject.org/ODreport). EMS trainers taught participants how to complete the Overdose Field Report. The MOUs with agencies who received naloxone through this program dictated that completion of the Overdose Field Report was mandatory.

Program Evaluation

Although an in-depth discussion of evaluation findings are premature and outside the scope of this implementation-focused manuscript, the MORE project does include a robust evaluation arm. *Process evaluation* components include ongoing monitoring of (a) publicly available overdose death data to guide outreach and implementation in high-need areas and with disparate populations, (b) training summaries from EMS trainers to track training volume, (c) MOUs established with agencies to acquire naloxone, and (d) naloxone distribution tracking from LPHAs. *Outcome evaluation* components have three primary components including (a) OEND training surveys to assess participant changes in knowledge and attitudes (Williams et al., 2013), self-efficacy regarding overdose response, and naloxone-related risk compensation beliefs (Winograd et al., 2017), (b) 6-month follow-up surveys with representatives from first responder agencies supplied with naloxone to assess barriers and successes related to naloxone administration, and (c) ongoing monitoring, analysis, and follow-up on Overdose Field Report data (e.g., identifying overdose spikes in a specific area or with a specific population or unique patterns over time). Data regarding participants' overdose knowledge and attitudes and feedback about their internal naloxone programs are analyzed and shared across the MORE project team to iteratively update and inform training content and outreach approaches. Additionally, Overdose Field Report data is regularly analyzed and used to ensure naloxone is being distributed in areas with the highest need.

Staffing Needs

Operating a train-the-trainer program requires ample project staff time in addition to the tangible costs of naloxone purchasing and distribution. Thus, for the sake of transparency and the goal of improving the likelihood of program replication, we outlined the exact breakdown of our project costs. The MORE project has an annual budget of \$800,000 across a 4-year period (3.2 million total) to serve 107 predominantly rural, Missouri counties without existing naloxone programs with a population of approximately four million and a crude opioid-overdose death rate of 7.77 per 100,000 persons. Per SAMSHA requirements, no

more than 20% of the budget (\$160,000) may be used for evaluation, including data collection and performance measurement, and no more than 10% (\$80,000) may be used for administrative costs. Evaluation costs were used to contract with an outside entity to fund the salary, fringe benefits, and travel expenses, of the evaluation team. Administrative costs were used to fund the salary, fringe benefits, and travel expenses for the MORE Project Director. Approximately 50% of the entire budget was allocated specifically for the purchase of intranasal Narcan to be distributed to first responders (\$434,407; 5,760 units [2 doses per unit]). Approximately 20% of the budget was dedicated to training efforts (i.e., contracted EMS training entities and the development of the online training curriculum). LPHAs, which stored and distributed naloxone to local first responder agencies, did so in-kind.

Discussion

The MORE project has been successful at training PFRs and distributing naloxone across rural areas of Missouri as underscored by the large-scale adoption by PFRs and the geographic spread, two key metrics of implementation effectiveness (Proctor et al., 2011). During the first 2 years of grant implementation, approximately 4,500 PFRs were trained to recognize and respond to an opioid overdose, almost 13,000 kits of naloxone (26,000 doses) were distributed, and almost 200 PFR agencies were equipped with and began carrying naloxone suggesting broad adoption of the program. Highlighting the penetration, or spread, of program implementation, individuals from approximately 93% of counties in the MORE catchment area (99 out of 107) participated in the overdose response training and agencies in 73% (78 out of 107) of counties began to carry naloxone as a result of this program. Key to the successful adoption and spread of this program has been the utilization of both train-the-trainer and online methods for delivering educational content and the willingness of LPHAs to serve as distribution hubs for naloxone.

Both the in-person train-the-trainer and online training models have advantages and disadvantages. Using regional experts who can relate to the audience is an advantage of in-person trainings as they are better able to facilitate and encourage discussions related to the local context of drug use and overdose. However, expert-led in-person

trainings are difficult to financially sustain long-term, and face logistical barriers (e.g., trainer and participant availability, time, and funding). Train-the-trainer models overcome these barriers as they increase the spread of individuals who can serve as (often unpaid) trainers, but also may face fidelity concerns to the extent that subsequent trainers deliver the content as intended. For these reasons, online trainings can be a useful tool to overcome concerns related to fidelity, sustainability, and logistics to quickly diffuse training content in rural areas (particularly among agencies with limited staff who may find attending an in-person training difficult due to overwhelming shift needs). However, weaknesses of online training programs include limited real-time discussion of training content, limited ability to tailor training content to the local context, and the upfront time and financial investment needed to create the online program. More research is needed on the extent to which in-person and online methods of training delivery result in equivalent training outcomes, specifically regarding overdose education and naloxone administration.

MORE training content was developed by OEND experts based on existing research in the field; however, alternative approaches could be used as part of an OEND training. For example, although training content using the brain-disease model of addiction was purposefully chosen due to the mass consensus of national medical and public health agencies (Kushner, 2010), we acknowledge that this is not the only approach to understanding or teaching about the development and presentation of substance use disorders. Future trainings should evaluate whether including a broader discussion of potential addiction processes and terms for conceptualization has a greater impact on training outcomes. Some research suggests viewing addiction through an environmental lens (Hammer et al., 2013), or a consequence of the human desire to alter consciousness (Kushner, 2010), may resonate more with some training participants.

Using LPHAs as a hub to store and distribute naloxone to PFR agencies within their respective counties worked well, but there are also alternative approaches that should be considered. The MORE program worked with LPHAs given their eagerness to participate, integration within each county, and affiliation with the Missouri

Department of Health and Senior Services (the department responsible for grant implementation). Alternative approaches might include shipping naloxone directly to PFR agencies themselves or working with other local community organizations to store and distribute naloxone. Future programs implementing large-scale naloxone distribution should consider what would work best in their communities given the project scope, ability to collaborate with specific agencies, and existing relationships among agencies within a community.

Although PFR agencies typically receive only a small allotment of naloxone at a time from the MORE project, some supplies may not be used prior to the listed expiration date. Though naloxone has been shown to be effective years after its expiration date (Pruyn et al., 2019), many PFR agencies have protocols preventing use post-expiration. To prevent naloxone from going unused before its expiration, the MORE Project Director must be diligent in tracking expiration dates and naloxone utilization. Follow-ups with PFR agencies are necessary to ensure donations to community organizations that may be able to more quickly use and distribute it. Ongoing work is needed to determine the extent to which naloxone in these types of PFR programs remains unused, which may ultimately affect program implementation decisions and cost-effectiveness.

Programs partnering with PFR agencies to carry naloxone should also consider partnering with community organizations to distribute naloxone to lay responders who may be most likely to be on the scene of an overdose event at the time it happens. Indeed, more efforts are needed to expand access to PWUDs (e.g., Townsend et al., 2020) and individuals who are most likely to witness an overdose, particularly given the high prevalence of overdoses that occur in private residences and are reversed by peers who may or may not call for emergency services (Missouri Overdose Field Report, 2019; St. Louis City Medical Examiner, 2019). First responder leave-behind naloxone programs are a promising approach and have been implemented in a number of cities in the United States (Cook, 2018; Sulek, 2019). These programs involve first responders providing naloxone to overdose survivors and their family members or associates following an overdose in the event they need to use it themselves in the future. Such programs capitalize on informal networks of PWUDs in

rural areas to increase layperson availability of naloxone and information regarding harm reduction practices and treatment options (Albright & Castillo, 2018).

In conclusion, the MORE project has provided a novel framework for the mass diffusion of OEND to non-EMS PFRs in rural areas and has filled a gap in the dissemination of OEND across rural Missouri. Train-the-trainer and online training methods were both useful approaches for training first responders and were particularly useful for reaching responders in geographically spread-out areas. Furthermore, using LPHAs as a hub for naloxone distribution worked well for distributing naloxone to PFR agencies; although other approaches may also prove successful. Future large-scale overdose prevention efforts that focus on rural areas should make use of local community organizations to assist with naloxone distribution and training efforts and expand the scope of distribution to lay responders.

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