

**Evaluation of the Community Opportunity, Network,
Navigation, Exploration, and Connection Team (CONNECT)
Year 1 Report**

**Submitted to
Opioid Task Force of Franklin County and the
North Quabbin Region
Franklin County Justice Center
43 Hope Street Room 1705
Greenfield, MA 01301**

**Elizabeth Evans, PhD, Principal Investigator
Calla Harrington, MPH, MSW
Amelia Bailey, BA
Department of Health Promotion and Policy
School of Public Health and Health Sciences
University of Massachusetts Amherst**

**312 Arnold House
715 North Pleasant Street
Amherst, MA 01003 <https://www.umass.edu/sphhs/hpp>**

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Introduction

Opioid overdoses in rural areas

Our nation's current opioid epidemic has resulted in unprecedented numbers of accidental injury, infectious disease (e.g., HIV, Hepatitis C), and premature death (US Dept of Health and Human Services, 2016). The consequences of opioid use disorder (OUD) have worsened during the COVID-19 pandemic (Volkow, 2020a). In Massachusetts, there was a 5% increase in the rate of fatal opioid overdoses from 2019 to 2020, with an estimated 2,104 people experiencing a fatal overdose in 2020 (MA Dept of Public Health, 2021). Omitted from these estimates are overdose events that do not come to the attention of emergency responders or other healthcare providers. Studies suggest that the actual number of overdoses are 30-60% higher than official estimates (Canadian Center on Substance Abuse, 2017; Wagner et al. 2015). The gap between actual and documented overdoses may have widened during the COVID-19 pandemic given national stay at home orders that reduced the number of individuals seeking hospital services for overdose events (Root et al., 2021). These realities underscore the need for public health interventions that situate overdose education and prevention activities in community-based settings.

Individuals living in rural settings are at a heightened risk for fatal and non-fatal overdoses (Hedegaard, Warner, & Miniño, 2017), and populations in rural Western Massachusetts are especially impacted (Grau et al., 2017; Harvard Medical School, 2021; MA Dept of Public Health, 2021; Partners for a Healthier Community Inc., 2015; Stopka et al., 2017). In rural locales, several factors at different levels of influence impact treatment access and retention (Lister et al., 2020). At the individual-level, the causes and consequences of OUD (Opioid Use Disorder) often lead to a fracturing of relationships with close family and friends (Cleveland et al., 2020; Ólafsdóttir, Orjasniemi & Hrafnadóttir, 2021). At the same time, OUD is associated with heightened social stigma and persistent risk factors. For example, OUD is associated with sexual or physical abuse histories, comorbid mental health disorders (e.g., anxiety, depression), and chronic pain (Evans et al., 2015; Hser et al., 2015). Therefore, many individuals with OUD have both a complex set of health and social needs that rural systems of care struggle to address, and also little family and social support to draw on. At the contextual level, increased access to medications to treat opioid use disorders (MOUD) have been slow to occur (US Dept of Health and Human Services, 2016), especially in rural settings (Andrilla, Coulthard, & Larson, 2017; Gastala, 2018; Jones, 2018). Efforts to increase MOUD utilization in rural settings have been hampered by the limited number of physicians who are willing or able to prescribe MOUD (Stein et al., 2015; Walley et al., 2018), inadequate transportation options, and other infrastructure limitations (US Dept of Health and Human Services, 2016; Rural Policy Advisory Commission, 2019).

Addressing the determinants of opioid overdose is best done by local communities in the context of supportive laws and policies and with a range of collaborators from a variety of relevant sectors (Braveman & Gottlieb, 2014; National Academies of Sciences, Engineering, and Medicine, 2017; Underwood et al. 2021). These types of multi-actor, multi-sectoral community partnerships have arisen in response to the opioid crisis in the form of local and statewide opioid task forces. Recent opioid task force efforts have focused on implementation of novel programs to engage more people with OUD in evidence-based treatment and other health and social services (Khatri & Perrone, 2020; Sigmon, 2019). These emergent programs have included, for example, increased capacity for provision of MOUD (Reif et al. 2020) and naloxone (Clark et al., 2014; Moustaqim-Barrette et al., 2021), empathic peer recovery support (Bassuk et al., 2016; Magidson et al., 2021; Winhusen et al., 2020), connecting family and friends of people with OUD to support services, and post-overdose intervention programs. In this report, we describe the early experiences and evaluation of a post-overdose intervention program called

CONNECT that is being implemented by an opioid task force and its affiliated community partners in the Franklin County and North Quabbin Region of Western Massachusetts.

What is CONNECT

The Franklin County/North Quabbin Region, a 30-town area of over 87,000 people and spanning nearly 1,000 squares, has been hard hit by the opioid crisis. In 2018 alone, opioid-related overdose deaths increased by 166.6% with 89% of deaths attributed to fentanyl. The region has only three full-time fire departments and four full-time police departments. The remaining fire/police departments are staffed part-time or by volunteers.

To better support first responders and to expand local efforts to decrease opioid overdoses and deaths, CONNECT is creating the first Franklin County/North Quabbin, Massachusetts 30-town, 24/7 opioid overdose rapid response team, using an evidence-based regional hub and spoke model, to respond to fatal and non-fatal overdoses in the only federally-designated rural county in Massachusetts. The CONNECT program aims to reduce opioid overdoses through rapid response times and multi-sectoral collaboration, as well as the expansion of naloxone availability and appropriate use. It will also enable first responders and bystanders to safely handle fentanyl and other illicit substances to “save lives safely.” The CONNECT program has seven main goals:

1. Provide real-time 24/7 assistance to survivors and witnesses of an opioid overdose;
2. Make in-person follow-up visits, within 72 hours to assess health and social needs;
3. Deliver comprehensive evidence-based care including peer support or trauma-informed practices to connect individuals to pharmacotherapy, community-based services and recovery supports;
4. Use “warm handoffs” to ensure opioid overdose survivors and witnesses navigate care across systems;
5. Expand naloxone availability and appropriate use by first responders and community bystanders focusing on naloxone deserts;
6. Create a database to track CONNECT participants for care coordination and conduct trainings on protections for bystanders who assist during an overdose; and
7. Establish safety protocols on fentanyl and other licit or illicit opioid exposure.

The grant awardees have clarified roles within the project as follows:

- The Design Team: The awardees and employees of the Franklin County Opioid Task Force
- The Response Team: All community partners who provide outreach and referrals
- The Triage Team: law enforcement, harm reduction providers and Design Team
- Implementation Team: All community partners and the Design Team
- Evaluation Teams: partners who created and manage data (the data system is called Critical Incident Management System (CIMS), from Kelley Research & Associates) and UMass Amherst, who provides analysis of the project

The CONNECT program is being implemented by the Opioid Task Force (OTF) of the Franklin County and the North Quabbin Region. The OTF subcontracted with UMass to conduct an evaluation of CONNECT. The project is funded by the Substance Abuse Mental Health Services Administration (SAMHSA) for two years starting September 1, 2020.

Evaluation design

The UMass evaluation of CONNECT will consist of three aims.

Aim 1. Conduct an Implementation and Process Study to understand how to adapt the Hub and Spoke Model for the local Franklin County/North Quabbin context. For this aim, we will:

1A. Describe and monitor (i) plans and strategies that CONNECT will use to adapt for implementation in the local context the protocols, knowledge, and skills that are currently being used to deliver the Hub and Spoke Model in Vermont (ii) plans and strategies for supporting CONNECT engagement and retention by the target population and (iii) the characteristics of the target population.

1B. Assess changes among CONNECT partners in emergency response protocols, criminal justice processes, clinical practices, and organizational adaptations in response to program implementation, identifying factors that enable or impede the ability of agencies and institutions to engage in multi-sectoral collaboration.

1C. Assess to what extent program activities are implemented as intended and result in desired outputs.

Aim 2. Conduct an Outcome Study to assess utilization of CONNECT health and social services and associated outcomes. We will:

2A. Characterize the CONNECT “Pipeline,” per these indicators: of those who initiate first contact (call or text for assistance), the proportion who are visited within 72-hours (intake), the proportion who utilize health and social services within 6 months (6-month post-intake follow-up), and the proportion who utilize health and social services within 12 months (12-month post-intake follow-up) as indicated by existing de-identified participant tracking data.

2B. Assess perceptions of CONNECT staff of the CONNECT participants’ use of services and outcomes.

2C. Assess perceptions of CONNECT participants regarding their experiences of engaging with the program, use of services, and outcomes.

Aim 3. Conduct an Opioid Overdose Education and Naloxone Distribution (OEND) Study. We will:

3A. Describe characteristics of individuals who are trained on naloxone and safety protocols and assess at pre-post training the trainees’ naloxone knowledge and self-efficacy.

3B. Identify the number of naloxone kits dispensed by CONNECT, where kits are dispensed, and the characteristics of people who receive kits.

3C. Assess stakeholder perspectives of the CONNECT OEND activities and their impacts on opioid overdose reversals.

Qualitative data analyses will be conducted to identify factors perceived to be associated with health services utilization and outcomes and the extent to which these vary depending on participants’ socio-demographic characteristics (e.g., age, gender, race/ethnicity, SES), comorbid physical and mental health conditions, social support, utilization of health and social services, and hub location.

Scoping review

In this section, we provide a synthesis of the research literature on post-overdose intervention programs. Our aims were to provide context for CONNECT and identify resources and recommendations for implementation.

Introduction

Post-overdose interventions

Post-overdose interventions aim to engage an individual who has recently experienced an overdose by connecting the individual with healthcare resources which, in turn, are expected to reduce future overdose risks. Services include information on treatment options (e.g., MOUD, counseling), harm reduction services, peer recovery support, and/or other social services. Post-overdose programs typically intervene within 72 hours or within 1 week to one month after an overdose (Davoust et al, 2021).

Many post-overdose interventions are based in hospitals where individuals are receiving medical care (Bagley et al., 2019). These programs do not encompass overdose events in which emergency medical services (EMS) or police are dispatched to the site of an overdose, but the individual declines transportation to a hospital for further care (Bergstein et al., 2021; Keseg et al., 2019; Wagner et al., 2019). It is estimated that 58 - 80% of emergency responder calls to an overdose event result in transportation to a hospital (Harrison et al., 2021; Zozula et al., 2021). Individuals who refuse hospital transportation after naloxone administration are more likely to be women and vulnerable (i.e., single parent, living in poverty) (Harrison et al., 2021); and they experience greater risk of future EMS naloxone administration due to subsequent overdose events (Zozula et al., 2021). In effect, hospital-based post-overdose interventions exclude individuals who do not go to the hospital (Wagner et al., 2019), pointing to a gap in care for those who may be most in need of healthcare services. The consequences of this gap in care may be extreme, as mortality risk is higher in the post-overdose period (Weiner et al., 2020).

To address this service gap, communities have organized to create community-based post-overdose interventions. The Substance Abuse and Mental Health Services Administration (SAMHSA) has prioritized funding support for the planning, implementation, and delivery of post-overdose interventions to reduce overdose mortality in the US (Substance Abuse and Mental Health Services Administration, 2020). While community-based post-overdose interventions are being implemented, the evidence base for these programs is still emerging and not yet fully understood (Bagley et al., 2019).

Community-based post-overdose interventions

Two prior scoping reviews have synthesized the literature on community-based post-overdose intervention programs. Bagley et al. (2019) synthesized what is known about “post opioid-overdose interventions” in community settings (n=16) and hospital settings (n=11). Champagne-Langabeer et al. (2020) further explored 27 “out-of-hospital post-overdose interventions” with a focus on administration of interventions by paramedics and fire department staff. Both reviews found post-overdose interventions were needed to address a gap in healthcare service and were led by public health and public safety teams but noted great variability in intervention design and limited monitoring or reporting of outcomes (Bagley et al., 2019; Champagne-Langabeer et al., 2020). Most information derived from the two reviews centers on gray literature, which has potential limitations in relation to study design, construct measurement, and data quality (Adams, Smart, & Huff, 2017).

Notably, few of the prior scoping reviews of post-overdose interventions have included programs that engaged law enforcement partners in program implementation and operation (Bagley et al., 2019; Champagne-Langabeer et al., 2020). Law enforcement personnel are recognized as potential key partners in post-overdose interventions and other public health initiatives that aim to reduce harms of the opioid epidemic (Becker, 2021; Goulka, Del Pozo, & Beletsky, 2021). Law enforcement staff can play a significant role in referring individuals to treatment and other forms of healthcare (Schiff et al., 2017; Yatsco et al., 2020a). At the same time, inclusion of law enforcement and other criminal justice personnel can present differing views of how to treat opioid and other substance use disorders (Saloner et al., 2018), raise ethical concerns, and yield other issues that complicate the implementation of public health initiatives.

Current review

To further grasp the context and definitions of post-overdose interventions, a scoping review methodology was selected to survey current peer-reviewed literature. This scoping review will address current knowledge on community-based post-overdose intervention programs utilizing law enforcement partnerships. The review will extrapolate data from peer-reviewed literature on the defined programs and provide guidance for implementation of similar interventions.

Methods

Design

The scoping review was conducted using the PRISMA checklist modified for scoping reviews (Tricco et al., 2018).

Eligibility criteria

We searched for articles published between January 2001 and July 2021 to capture the most recent two decades of addiction research. Abstracts which detailed the following activities as part of the intervention were included in the review: 1) Received notification of an individual's opioid overdose within one month of the incident, 2) Received notification of opioid overdoses that occurred in the community (i.e., at residence, in shelter, on the street), 3) Contacted individual(s) who had experienced or witnessed an opioid overdose, and 4) Attempted to connect or successfully connected individual(s) with resources (health and/or social services) in the community. Articles were included when process or outcome data was reported.

Additionally, articles were searched to include law enforcement-involved interventions. To identify additional literature for potential inclusion, we examined the reference lists of articles meeting the inclusion criteria, first by title and then by abstract for potential inclusion.

Interventions based primarily in a hospital, police station, fire station, or other institution were excluded. These programs were different in design and needs than interventions taking place in the community. Articles were also excluded if the intervention's primary purpose was to deliver services pre-overdose or to conduct prevention activities. Articles were excluded if not published in the English language or published on interventions outside of the United States. Articles were excluded if scoping or systematic review.

Information sources and search

We searched PubMed for peer-reviewed literature. Search terms included post-overdose, intervention, opioid overdose, community, and law enforcement.

Selection of articles

From the search results, one reviewer examined the article's title and abstract for inclusion. Next, we obtained the full text of articles for the second phase of review. Two reviewers

independently completed a secondary screening by reading the full text of each article. If the article did not meet the inclusion criteria at this time, it was excluded from further analysis. The data extraction process was completed by two reviewers. The peer-reviewed articles included for final review were read through and coded for information corresponding to the relevant programmatic measures. The measures were used to provide insight into program commonalities, differences, and salient outcomes.

Synthesis of results

From the identified articles, the following characteristics were extracted: title (if provided), location (including population size), year of foundation, key partners involved with planning, implementation, and delivery, sample size, methods for data sharing, methods for identification of prospective primary participants and secondary participants (i.e., other populations impacted by the intervention aside from primary population), method of outreach, services offered (i.e., treatment or recovery-related services, social services), participant socio-demographics (if provided), study design, and results.

Results

From the original search, 377 articles were found. Of those, eight articles fit the inclusion criteria for the current study. The included articles present information on three individual programs and three articles on multiple, unidentified programs. Three articles (Langabeer et al., 2020; Langabeer et al., 2021; Yatsco et al., 2020b) represent the same program. Additionally, three studies (Formica et al., 2018; Formica et al., 2021; Davoust et al., 2021) include a culmination of several programs (number of programs included ranged from 20 to 138), illustrating an amalgamation of program structures. Seven of the papers described implementation of programs and one described a research study (Scott et al., 2020).

Location and year established

The articles represent programs located in four states (Massachusetts, Texas, Arizona, Illinois), encompassing both rural (lowest population 10,000 individuals) and urban areas (highest population 2.7 million individuals) (United States Census Bureau, 2020). All programs were founded after 2013 and the majority were founded between 2014 and 2018. One article, White et al. (2021), detailed a program established after 2018.

Multidisciplinary teams

All programs had a team of key partners which steered functions of the respective programs. Most programs' key partners were comprised of both law enforcement and public health personnel. Key partners typically represented police departments, fire departments, hospitals, and behavioral health organizations. Local universities often served as program evaluators.

Target population

Every program's target population was a person who had experienced an overdose. All programs received data from first responders, either police or EMS, to identify people who had overdosed. Most programs used 9-11 call data and supplementary police reports. Some programs had relationships with either police or EMS to directly enter calls or reports into a shared database. Determining which incidents were reported to the intervention team varied. Some programs defined overdose reports as incidents where naloxone was administered, incidents where naloxone was administered and successfully reversed an overdose, or incidents which involved any indication of substance use per the responder's discretion. Over half of the articles were about programs with structured study criteria, where participants were screened for eligibility. Inclusion for those programs required no current treatment enrollment, regular use of opioids (i.e., using 13+ days in past 30 days), and age 18 years or older. For

study purposes, these programs also required participant informed consent before study participation. The remaining programs did not document informed consent procedures.

Almost half of the programs also mentioned contacting friends or family members of a person who experienced an overdose. This type of outreach was conducted to offer services for friends or family (i.e., support services) or to seek information about the person who overdosed. Detailed information was not provided on the method, context, or content of these communications. Data was not collected on the number of family or friends contacted, their relationship with the person who overdosed, or their sociodemographic characteristics.

Timing and method of initial outreach

Of the articles that indicated timeframe of outreach, several programs conducted outreach 24 hours to 72 hours after an overdose event, several were up to a week afterwards, and one conducted outreach within 30-days after an event. Like the key partners who directed the program initiatives, the staff who conducted outreach were often a two- or three-person team comprised of a first responder (often law enforcement, rarely EMS) and behavioral health staff (peer recovery coach, patient navigator, or clinician). Two programs documented a behavioral health worker solely conducting post-overdose outreach. Scott et al. (2020) had trained research staff independently conduct outreach. The outreach personnel often received special training, such as substance use disorder and motivational interviewing education.

The first outreach attempt was typically conducted directly to the residence of the person who had overdosed, where outreach workers would engage the individual with the respective program. Fewer programs used a phone call as the first point of outreach, and then conducted in-person outreach to a residence. Of the 20 programs studied in Formica et al. (2018), 30% of the programs conducted only phone outreach to participants. Davoust et al. (2021) detailed instances of community-wide outreach such as on-foot outreach to communities of high overdose rates instead aside from conducting individual residence outreach.

Program size and participant characteristics

Few provided data on program size and participant sociodemographic characteristics. Based on the four papers with this information, program size ranged from 24 to 81 participants over 8 to 12 months. Programs primarily served men (55.9% - 75%), people of White race (9.1% - 87.5%), and people of Black or African American race (14.6% - 66.7%). Average participant age ranged from 31.6 to 38.2 years (Yatsco et al., 2020b; White et al., 2021; Langabeer et al., 2020; Scott et al., 2020). Programs collected sparse information on socioeconomic status. Two articles presented data on homelessness and found a wide range of individuals reported homelessness or living in temporary housing (27.8% - 76.5%) (Langabeer et al., 2020; White et al., 2021). One article specifically mentioned omitting individuals who did not report a valid physical address (e.g., street intersections, businesses) due to the challenges that this created for recontact (Langabeer et al., 2021). In Langabeer et al. (2020), participants reported high rates of no health insurance (79.4%), active cigarette smoking (85.3%), and primary use of heroin (58.8%). Other studies did not report this information.

Services offered: treatment focused, many wrap-around services

All articles detailed programs which offered a variety of services. Every article detailed referral to addiction treatment or assistance with finding addiction treatment as a service offered. Some programs did not differentiate types of treatment but noted broad referral to substance use disorder treatment. Several articles mentioned referral to specific services, including: MOUD, abstinence-based inpatient programs, detoxification programs, group meetings, and other outpatient programs. The program detailed throughout Langabeer et al. (2020), Langabeer et al. (2021), and Yatsco et al. (2020b) exclusively offered rapid MOUD (buprenorphine) induction

and subsequent referral to long-term outpatient MOUD services.

After initial participant contact, most programs utilized peer recovery support for long-term engagement, although the capacity for peer support varied by program. Some programs maintained participant contact over the phone or, less frequently, in-person for an unspecified period. The behavioral health navigator in White et al. (2021) maintained contact with participants for the 45-day study period. For the program detailed throughout Langabeer et al. (2020), Langabeer et al. (2021), and Yatsco et al. (2020b), research staff maintained daily participant check-ins for the 90-day study period. In the Scott et al. (2020) treatment group, participants received continuous check-ins with a linkage manager to discuss treatment motivation, barriers, and progress over the study's four-week period.

Many programs offered naloxone or naloxone education for those who experienced an overdose and sometimes also to their family or friends. Few studies mentioned programs facilitating referral to other harm reduction services (i.e., syringe service programs). Several programs detailed connecting participants to wraparound services, such as employment, transportation, food, housing, and health insurance, as these issues presented barriers to treatment for participants. Only one program mentioned connecting participants to mental health treatment services (Yatsco et al., 2020b).

Two articles specifically mentioned referring families to involuntary civil commitment to treatment for their loved one experiencing addiction or mental health crisis (Formica et al., 2018; Formica et al., 2021). Few programs conducted outreach to the residences of fatal overdoses to offer grief services to friends or family of the deceased. White et al. (2021) mentioned offering broad family support and child services. The remaining articles did not mention offering child-specific services.

Available outcomes of post-overdose interventions

The outcomes of post-overdose interventions reported in these articles represent a variety of differing evaluation and research designs, measures, and results.

Evaluation and research design

All articles were published by an outside evaluator or researcher, in coordination with or separate from program implementers or key partners. The evaluator/researcher was most often employed at a university and less frequently at a healthcare system. Most of the studies collected quantitative data. Data was commonly elicited through surveys, conducted at baseline and/or after the study period. Surveys were sometimes administered to program staff but were most often administered to program participants. For a few studies, quantitative data was also extracted from existing administrative data to measure program participant demographics and/or other health characteristics.

Three of the studies collected quantitative data and qualitative data. A total of four studies collected qualitative data, elicited through focus groups, interviews, and/or observation of key partner meetings. In one study, interviews were conducted with program participants after the 30-day intervention period. In the remaining three studies, focus groups/interviews were conducted with program staff. Scott et al. (2020) was the only study to randomize participants into a treatment or control group. No other studies analyzed a comparison group.

Process measures and results

Key partners provided insights into post-overdose intervention implementation. Of these insights, barriers included: stigma within organizations and within the community, lack of leadership buy-in, lack of funding, issues with data sharing among organizations, and structural barriers to participant treatment engagement (i.e., obtaining health insurance, contacting

individuals when homeless). Additionally, one article mentioned the slow growth of a new program coupled with potential participant mistrust of law enforcement involvement as a potential barrier to intervention utilization (Yatsco et al., 2020b). Key partner reported facilitators were partnerships, communication, understanding of limitations and norms, information sharing, continuous meetings, and leadership buy-in across agencies. Programs also noted different staff roles providing strengths in connecting individuals with treatment, for example, the ability of peer recovery coaches to connect with individuals' lived experience during outreach visits (Langabeer et al., 2021).

Key partners in one study reported that implementation was not a fixed one-time event but instead involved constant program adaptation, adoption of a harm reduction model, and an evolving definition of success (Davoust et al., 2021). Anticipated benefits included providing treatment services to a financially vulnerable and treatment hesitant population. An additional benefit of a post-overdose intervention was to supply law enforcement officers with the tools and training to save lives (White et al., 2021). From the participant interviews, persistent, caring follow-up was a reported facilitator of program operation.

Outcome measures and results

Four articles detailed participant engagement with treatment after referral during post-overdose contact. Of those programs, there was variation in rate of initiating treatment after first contact, ranging from 23% to 81% of participants entering treatment after referral (Yatsco et al., 2020b; White et al., 2021; Langabeer et al., 2020; Scott et al., 2020). Two articles detailed MOUD treatment retention after post-overdose treatment referral. One article reported that 44% were retained in MOUD treatment at 30-days after first treatment entry (Scott et al., 2020). Another article reported that the MOUD treatment retention rate was 88% at 30-days after first treatment entry and 56% at 90-days after first treatment entry (Langabeer et al., 2020). In one article, three participants reported a return to opioid use but continued to stay engaged with treatment for the 90-day intervention period (Langabeer et al., 2020). The papers reported that there were no deaths or overdose events within the 30- or 90-day intervention periods.

The study which examined a comparison group, Scott et al. (2020), found the group which received social services referral, individualized treatment counseling and scheduling, and continuous check-in, was significantly more likely to initiate treatment for OUD (intervention 81% vs. control 35%), especially MOUD (81% vs. 18%), and stay engaged in MOUD after the 30-day intervention period (44% vs. 6%), as compared to the passive control group.

Discussion

Community-based post-overdose interventions that involved law enforcement partners are being implemented around the country with limited knowledge on effectiveness. This scoping review addressed current knowledge on these programs through review of empirical literature.

Promising results

Use of multidisciplinary teams

Other public health and public safety initiatives have found facilitators for program implementation include buy-in for helping people with addiction to engage with treatment, a network of multidisciplinary community partners, and the ability for partners to communicate and share data effectively across sectors (Yatsco et al., 2020a). In the present study, examples of these communications included weekly meetings, triage meetings for individual overdose cases, and having a "boundary spanner" (i.e., an individual with experience in both public safety and public health sectors) involved in program implementation. These findings illustrate a salient component to bridging relationships between public safety and public health partners in collaborative programs and can be useful guidance for future program implementers.

MOUD engagement and retention

Evaluations of hospital-based post-overdose interventions with an engaged follow-up component have lower rates of 90-day retention than community-based post-overdose interventions in the current review (34% vs. 56%) (Dahlem et al., 2020; Langabeer et al., 2020). This finding suggests community-based post-overdose interventions, with an emphasis on connecting individuals to MOUD, can uniquely communicate with and motivate vulnerable individuals who otherwise may not have entered treatment (Harrison et al., 2021; White et al., 2021).

Areas for improvement

Capacity for mental health services

Individuals with OUD have significantly higher rates of mental illness and subsequent mental health care needs (Novak et al., 2019). Those with co-occurring mental illness have increased risk for fatal overdose (Webster, 2017) and this risk may have been exacerbated by the COVID-19 pandemic (Cales et al., 2021). The programs in the review did not describe connection to long-term mental health support for individuals. In consideration of high rates of mental illness among this population, this is a gap in documented service provision which should be explored by future programs to establish whether post-overdose interventions can improve access for mental health services.

Participant population

The programs in the current review lacked rural representation. Transportation access and stigma are barriers to substance use treatment in rural areas (Ellis et al., 2021; Faul et al., 2015; Haffajee et al., 2019; Kiang et al., 2021; Nguyen et al., 2019). Like findings in the current review, commonly cited barriers to substance use treatment include lack of health insurance and homelessness (Park-Lee, Lipari, & Hedden, 2017). Future rural programs could be better tailored to these needs, including education for medical staff to reduce stigma (Volkow, 2020b) and establishment of a robust referral and service navigation effort to increase access to health insurance and stable housing.

Facilitating services for other individuals

In the present review, programs that connected family and friends with support services following a loved one's fatal or non-fatal overdoses did not describe method of outreach and service provision. Witnessing an overdose and experiencing overdose-related grief can require psychological care (American Psychiatric Association, 2013; Feigelman et al., 2011). Individuals who experience overdose-related trauma or grief often do not seek services due to stigma (Bergman, Axberg, & Hanson, 2017). By conducting outreach to these individuals, post-overdose interventions are filling a healthcare service gap. Future efforts for post-overdose interventions could benefit from developing, implementing, and evaluating program components which serve others affected by opioid overdose. For example, provision and evaluation of training materials for specialized law enforcement partners on how to best serve an overdose witness.

Support services for children who were involved with an overdose were not well-documented in the current study. Including services for children within a post-overdose intervention could be a useful avenue to increase public health (Bergman et al., 2017). One complexity of intervening with children after their exposure to a drug overdose is the risk of child removal for perceived safety risk (Thumath et al., 2021). Child removal is associated with increased odds of parental overdose (Thumath et al., 2021) and myriad unmet parental healthcare needs (Canfield et al.,

2017; Doab et al., 2015). Other peer-reviewed interventions triage and connect parents with integrated services (Hall et al., 2015; Hall et al., 2016). Post-overdose interventions could benefit from connecting individuals with integrated services including peer recovery coach support, child-welfare worker, and MOUD treatment referral.

Need for rigorous evaluation of implementation and outcomes

Robust implementation science studies utilize mixed-methods design to further expand knowledge on factors which challenge and facilitate early implementation of novel public health programs (Powell et al., 2013), for example: the effectiveness of a central database to track cases among multidisciplinary partners and the effectiveness of program-specific law enforcement trainings. Additionally, to evaluate public health program outcomes, other study methodologies include collection of administrative data (i.e., from first responders, criminal justice facilities) to track long-term outcomes (Bigelow et al., 2020) and collection of participant self-reported data. Outcomes to measure from these data sources include use of MOUD, overdose, hospitalization, mortality, arrest, and incarceration. Collecting data points through these sources will provide additional triangulation of findings.

Limitations

A limitation of the current scoping review process was the quantity of databases assessed. One peer-reviewed database (PubMed) was searched to capture empirical public health articles. Searching more databases with the same search schema may elicit more peer-reviewed articles on post-overdose interventions. For future directions, potential search databases include PsycInfo and Web of Science. Additionally, future research could search a criminal justice database of peer-reviewed evidence to capture the public safety perspective of post-overdose interventions.

Another limitation of the present review is that programs only documented in gray literature (i.e., post-overdose interventions documented in online or government reports) were excluded from the present search. The present review does not capture the potential diversity and variation of gray literature-documented post-overdose interventions around the US.

Limitations of the current review findings include programs having non-standardized evaluation measures and, therefore, limited generalizability across studies. Previous post-overdose intervention reviews found programs lacked robust outcome data to suggest program effectiveness because programs were emergency responses to combat the opioid epidemic (Bagley et al., 2019; Champagne-Langabeer et al., 2020). Further evaluation needs to be built upon more robust study designs to substantiate findings on community-based post-overdose interventions.

Conclusions

This scoping review found an early indication of greater MOUD-treatment engagement and retention rates among individuals connected to services from community-based post-overdose interventions compared to previous post-overdose intervention models. Future programs can take guidance from the facilitators documented in the peer-reviewed literature, including key partner collaboration, communication, and understanding across sectors, and the ability for key partners to communicate with participants from their respective field of expertise to motivate and support recovery engagement. Challenges to program success were also documented in the literature including inability to contact hard-to-reach individuals and structural barriers to treatment access and engagement. More rigorous evaluation of community-based post-overdose interventions are needed to establish a robust program model for future implementers.

Program Status Year 1

CONNECT system for tracking overdose events

In the first year of program implementation, CONNECT launched Critical Incident Management System (CIMS), a database that is used to track overdose events that occur in the catchment area. Table 1 shows CIMS data on overdoses that occurred from July 4, 2021 to September 29, 2021, in the CONNECT pilot-test communities of Greenfield, Montague, and Deerfield. These data show the capacity of the CIMS system to be used as a means for tracking the characteristics of overdose events. These results are preliminary and subject to change, they also do not reflect the number of overdoses that did not elicit a 911 call. For example, during the first three months of program operation, 26 overdose events were data entered into the database; 8% were fatal. Most of the individuals with an overdose were men and age 20 to 59, and 28% were unhoused. Most of the events (60%) occurred at a residence. Few incidents (4%) involved a child, defined as a child being present at overdose or has a connection to the individual who had an overdose. More than half (64%) involved naloxone being administered and 88% resulted in the individual who overdosed being transported to the hospital.

Table 1. Characteristics of Opioid Overdose Events, CONNECT Program 7/4/2021 to 9/29/21	
n=26	
Fatal overdose (%)	8.0%
Non-fatal overdose (%)	92.0%
Average number of incidents per person	1.125
Female (%)	36.0
Age (%)	
20-29	20.0
30-39	32.0
40-49	24.0
50-59	20.0
60-69	4.0
Unhoused (%)	28.0
Incident at residence (%)	60.0
Child involved (%)	4.0
Naloxone administered (%)	64.0
Transported to hospital (%)	88.0

The planned flow of CONNECT participants

When 911 is called for an opioid-related event or police officers are responding to an event when opioid use and overdose are involved, officers deliver life-saving measures, including but not limited to administering naloxone, and afterwards document the event in the Critical Incident Management System (CIMS) database. Once documented in the CIMS database, an alert is sent out to the CONNECT response team, which includes peer-recovery coaches and

sometimes police officers. This team attempts to meet with the individual who overdosed and any bystanders or close contacts within 72 hours after the overdose event to provide information and resources on treatment options and harm-reduction resources. CONNECT staff leave the comprehensive Community Information and Resources Packet and a harm reduction kit which includes naloxone. As needed, the CONNECT response team offers additional services to the individual, including harm reduction, community health worker support, and child services referral (CONNECT, 2021). After meeting with the individual, the CONNECT outreach team documents in CIMS that services were provided. If the outreach team is unable to reach an individual at their residence, they will leave a contact card for future connection. The CONNECT outreach team will conduct follow-up with an individual for up to five days after the overdose event.

Topics from early implementation

The CONNECT implementation team has met regularly to check-in on the flow of cases, discuss any challenges or concerns that arise during implementation, celebrate successes, and plan for next steps. Beginning in July 2021, the UMass Amherst research team joined these meetings to learn about the program design and experiences with program implementation. In this section, we summarize a few key topics that were raised during discussion and as documented in meeting notes.

Establishing common ground: Mutual respect and shared understanding

The CONNECT implementation team consists of community partners who represent different institutions, have diverse expertise and knowledge, and fulfill distinct roles and responsibilities related to program implementation. While multisectoral work is a recommended practice (National Academies of Sciences, Engineering, and Medicine, 2017), such work comes with challenges and can itself be a challenge to program implementation (Underwood et al. 2021). In this context, collaboration is often facilitated by a shared mission and coordinated actions based on mutual respect and collective understanding of the experiences and needs of the intended population (Green & Johnson, 2015).

In relation to CONNECT, these dynamics were exemplified by some of the experiences of bringing together historically distinct organizations. In particular, the proposed intent of the CONNECT program was to create a response team that would include harm reduction specialists alongside police officers. During program implementation, the agency that led harm reduction efforts expressed concerns about how people who use opioids might perceive such a collaboration. A key point of concern was that individuals might refrain from engaging with harm reduction services for fear of potential criminal justice consequences. Another issue stemmed from uncertainties as to whether such a collaboration might cause harm reduction agencies to be perceived in the community as being allied with criminal justice institutions in ways that might harm more than help people with opioid use disorder. Discussions are currently underway to explore how to involve harm reduction services in CONNECT response activities while being sensitive to the reputation and roles that harm reduction agencies have already established in the community.

To create common ground, the CONNECT implementation team hosted ongoing conversations about the purpose of the program, that is, to save lives. Within these conversations, team members discussed aspects of balancing public safety with public health. Also, to assist with shared understanding of CONNECT's short-term and long-term goals, the CONNECT design team created visual guides, including a road map, of the project goals. These documents were shared in meetings to orient the implementation team to tasks at hand, celebrate accomplishments, and outline future tasks.

Starting with the launch of the program, the CONNECT implementation team emphasized the intent to use trauma-informed practices for collaboration and program implementation. In relation to people being offered CONNECT services, this approach meant, for example, that response team members would elicit preferred follow-up methods and use non-stigmatizing language to talk about opioid and other substance use. In relation to collaboration among the CONNECT team members, trauma-informed practices included activities to set ground rules for discussions and use of strategies to support inclusion and belonging among team members. Furthermore, the CONNECT implementation team participated in educational sessions led by an external organizational expert on how to communicate effectively on challenging topics and methods for achieving positive group dynamics. Such use of external facilitators has been effective in helping teams identify and address communication barriers to interdisciplinary teamwork (Nancarrow et al. 2015).

Populations and topics of focused consideration

The CONNECT implementation team recognized that accomplishing the program goals required focused consideration of certain populations and topics.

One issue that arose during early program implementation was rooted in uncertainties related to if or how the mechanism for *involuntary commitment to treatment* for opioid and other substance use disorders (i.e., Section 35 commitments) intersect with the CONNECT program. A recognized misconception is that some people who are revived from an opioid overdose with naloxone believe that they are safe from subsequent imminent overdoses. Among some CONNECT program implementers, a perceived benefit of involuntary civil commitment is that it is believed to ensure that a person who is administered naloxone is observed in a hospital setting for re-occurrence of the overdose. Conversations raised issues that have been highlighted elsewhere (Christopher et al., 2020; Evans et al., 2020; Udwadia & Illes, 2020) including the need to better understand involuntary civil commitment, when and how it is invoked, services provided, expected outcomes, related ethical issues, and whether and how it might be used to promote health in line with the goals of the CONNECT program.

Another issue of early implementation centered on the *children who witnessed or were otherwise impacted by an overdose*. There were concerns that assessment of child involvement might lead to reports to the Department of Children and Families (DCF) which could, in turn, prevent parents or other caregivers from contacting CONNECT, using CONNECT resources, or compromise the ability of families to support recovery. Concerns are consistent with some research that has reported, for example, that mothers with opioid use disorder have described feeling that DCF can set them up for failure and that child removal can contribute to an overdose (Cleveland et al., 2020). Other research, however, has reported that the requirement of parental engagement in evidence-based OUD treatment as a condition of retaining child custody is an opportunity to increase motivation and engagement in treatment (Seay et al., 2017), and increased engagement reduces risk of overdose (Timko et al., 2016; Hser et al. 2016). Other literature documents how engagement of parents in treatment for OUD is made difficult by individual characteristics (e.g., co-occurring health conditions and related healthcare needs, lack of social support, poverty) (Canfield et al., 2017; Tarplin & Mattick, 2015; Grella et al., 2009), and certain organizational practices and expectations for caregivers (e.g., to have a job and also attend custody and treatment-related meetings), uncoordinated services, geographic and transportation barriers, and institutional stigma (Taplin & Mattick, 2013; Wolfson et al. 2021). The CONNECT implementation team identified a desire to provide services to children who are affected by an overdose as well as provision of services for parents and caregivers on how overdoses impact the family. The CONNECT design team invited local DCF

employees to share information on roles and responsibilities and engage in discussions about potential collaboration with CONNECT. Cross-organizational education has been used elsewhere, for example to train opioid treatment providers on DCF resources, practices, and requirements and to train DCF employees about parental OUD (Leiner et al., 2021; Cleveland et al, 2020). Interactions thus far have helped identify the topic of children and parental opioid use as points of continued discussion and areas needing additional training and resources.

A third population of interest was individuals with an overdose history who *continue to use opioids* or engage in other types of active substance use. The CONNECT implementation team invited guest speakers to present strategies for safer use of substances and other methods for reducing the harms of substance use. Harm-reduction techniques included clean syringes and needles, safe needle disposal, avoiding using opioids alone, fentanyl testing before preparing an injection, and supplying naloxone along with training on how to administer it. The presentation evoked conversations about the extent to which and how harm-reduction activities could be included in CONNECT services.

A final population of consideration was focused on individuals who are *homeless*. People who are homeless, houseless, or unstably housed are often without consistent contact methods in that they lack active phones, cell phone minutes, mailing addresses, or other means for follow-up visits. Limited contact methods act as a barrier for the CONNECT response team, challenging the ability to meet with the individual to provide referrals and resources. When the response team can contact homeless individuals, the response team noted the additional challenges of finding intensive and integrated resources to meet the diverse needs of individuals who are homeless.

Tracking overdose events

CIMS was launched at the outset of CONNECT implementation to track overdose events and training was provided on how to use CIMS and what should be documented in it. In particular, the CONNECT implementation team worked to define what was meant by a qualifying overdose event. Another consideration was whether friends or family of the person who experienced the overdose, or witnesses to the overdose, were to be documented in CIMS. A final point in need of clarification was whether overdose events that came to the attention of community partners but were not routed through 911 should be logged into CIMS. These discussions raised issues regarding the scope and intent of the CONNECT program and issues of data confidentiality. The group recognized that CIMS, as originally designed, was not authorized for many of these additional purposes.

Also discussed was who should receive which information from CIMS and when, and how the system would operate to alert team members of initial events and follow-up events. As one example, law enforcement staff who had entered an initiating event into CIMS expected to see alerts in CIMS once response teams had taken action. When a response alert was not received, it was assumed that no response action had been taken. It was later clarified that these incidents were responded to but that responses were not visible in CIMS to the police officers who made the initial report. Similarly, implementation team members who do not have access to CIMS, but who do receive referrals, misunderstood what information was available in CIMS, thinking it was a complete dataset of CONNECT recipients, contact information for family and friends, and list of services offered to individuals or for which they were eligible. After cross-agency discussions, these misunderstandings were recognized.

The processes for using CIMS are currently being clarified. These activities helped previously siloed institutions to collaborate and discuss how to manage shared data systems, which are two achievements that have been reported to facilitate program implementation (Underwood et al, 2021; Pardo, Gil-Garcia, & Burke, 2006). An ongoing topic of discussion is whether CIMS

should be customized and in ways that would facilitate sharing of participant health and social service referral information across partnering community organizations while also abiding by laws and regulations.

Pivots and adaptations

The CONNECT program was initiated during COVID-19, which required immediate changes to plans for program implementation and operation. For example, to observe physical distancing precautions, meetings of team members were moved to Zoom. Another unexpected challenge over the first year of CONNECT program operation has been the limited ability of local departments and agencies to hire new staff, combined with the turnover of existing staff and the need to offer continuous onboarding and training. One implication of this reality is that police departments and other first responder agencies and healthcare agencies rely on part-time staff or volunteer staff to complete tasks. These staffing limitations have delayed data entry of 911 calls that are intended to trigger a visit by the CONNECT response team. Attention to the impacts of COVID-19 mitigation efforts and related adaptations are topics of ongoing focus as the CONNECT implementation team prepares to roll out the program to more communities.

Next steps

In the upcoming year, we will continue to monitor the implementation and operation of CONNECT (Aim 1) and assess the utilization of CONNECT health and social services and associated outcomes (Aim 2). To accomplish these aims, we will continue to attend the CONNECT implementation meetings and analyze data captured in the CIMS database. We will also collect qualitative data, from program implementers and from participants, to document experiences and assess knowledge, attitudes, and beliefs regarding the program. We will also conduct activities to understand the processes and outcomes of the efforts of CONNECT to provide opioid overdose education and naloxone distribution (OEND) (Aim 3) to the community.

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