Community Selected Strategies to Reduce Opioid-Related Overdose Deaths in the HEALing (Helping to End Addiction Long-term ℠) Communities Study

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Abstract

The Helping End Addictions Long Term (HEALing) Communities Study (HCS) seeks to significantly reduce overdose deaths in 67 highly impacted communities in Kentucky (KY), Massachusetts (MA), New York (NY), and Ohio (OH) by implementing evidence-based practices (EBPs) to reduce overdose deaths. The Opioid-overdose Reduction Continuum of Care Approach (ORCCA) organizes EBP strategies under three menus: Overdose Education and Naloxone Distribution (OEND), Medication Treatment for Opioid Use Disorder (MOUD), and Safer Prescribing and Dispensing Practices (SPDP). The ORCCA sets requirements for strategy selection but allows flexibility to address community needs. This paper describes and compiles strategy selection and examines two hypotheses: 1) OEND selections will differ significantly between communities with higher versus lower opioid-involved overdose deaths; 2) MOUD selections will differ significantly between urban versus rural settings.

Methods: Wave 1 communities (n=33) provided data on EBP strategy selections. Selections were recorded as a combination of EBP menu, sector (behavioral health, criminal justice, and healthcare), and venue (e.g., jail, drug court, etc.); target medication(s) were recorded for MOUD strategies. Strategy counts and proportions were calculated overall and by site (KY, MA, NY, OH), setting (rural/urban), and opioid-involved overdose deaths (high/low).

Results: Strategy selection exceeded ORCCA requirements across all 33 communities, with OEND strategies accounting for more (40.8%) than MOUD (35.1%), or SPDP (24.1%) strategies. Site-adjusted differences were not significant for either hypothesis related to OEND or MOUD strategy selection.

Conclusions: HCS communities selected strategies from the ORCCA menu well beyond minimum requirements using a flexible approach to address unique needs.

Keywords

1.0 Background

The opioid overdose epidemic is a national public health crisis. In the 12-month period ending in February 2022, over 100,000 people in the United States died of an overdose and more than 75,000 involved opioids (Ahmad, Rossen, and Sutton, 2022). The Helping End Addictions Long Term (HEALing) Communities Study (HCS), supported by the National Institutes of Health and the Substance Abuse and Mental Health Services Administration, is a multi-site study with the goal of reducing opioid overdose deaths in 67 urban and rural communities across four sites: Kentucky (KY), Massachusetts (MA), New York (NY), and Ohio (OH) (Walsh et al., 2020). The study tests the impact of the Communities that HEAL (CTH) intervention on opioid overdose deaths, which contains three components: 1) a community-engaged, coalition and data-driven process to facilitate implementation of Evidence-Based Practices (EBPs) (Martinez et al., 2020); 2) the Opioid-overdose Reduction Continuum of Care Approach (ORCCA), menus of EBP strategies and technical assistance guides for Opioid Education and Naloxone Distribution (OEND), Medication Treatment

for Opioid Use Disorder (MOUD), and Safer Prescribing and Dispensing Practices (SPDP) (Winhusen et al., 2020); and 3) communication campaigns addressing stigma and increasing knowledge of, and demand for, EBPs (Lefebvre et al., 2020). Communities were randomly assigned to receive the CTH intervention from January 1, 2020 – June 30, 2022 (Wave 1, n=34) or from July 1, 2022 – December 31, 2023 (Wave 2, n=33).

The rationale and evidence base for the ORCCA strategies are detailed elsewhere (Winhusen et al 2020). This study describes initial ORCCA strategy selection by Wave 1 community coalitions as a function of site, setting (rural versus urban), and baseline opioid overdose death rate (higher vs. lower). Two *a priori* strategy selection hypotheses were defined for the EBP menus most likely to impact opioid-involved overdose deaths: OEND and MOUD. Prior research suggests physicians practicing in rural, relative to urban, settings have greater bias against individuals with OUD (Franz et al., 2021). The provision of MOUD, relative to OEND, is more reliant on healthcare providers and infrastructure more prevalent in urban settings, thus, we hypothesized MOUD strategies would represent a greater proportion of urban-selected strategies. Second, OEND strategies typically can be implemented more quickly than MOUD strategies and might be particularly appealing for communities with relatively higher opioid overdose death rates seeking to rapidly intervene. Thus, we hypothesized OEND strategies would represent a greater proportion of selected strategies in communities above the median relative to those below the median deaths per 100k.

2.0 Methods

2.1 Community recruitment/participation

Communities were invited to participate in the HCS based on criteria, operationalized within each site highly impacted by opioid overdose fatalities and willing to implement MOUD and OEND (Walsh et al., 2020). Of note, all communities approached agreed to participate and only one withdrew from the study post randomization; thus, they are representative of highly-impacted communities. Community coalition stakeholders met regularly with implementation staff and academic partners to select ORCCA strategies based on community needs.

2.2 Selection of ORCCA strategies in community action plans

Table 1 lists ORCCA menus with accompanying submenus, sectors and required components. Table 2 contains a list of venues within sectors. ORCCA required community coalitions to select at least five strategies from the ORCCA menu for action plans: 1: active OEND (OEND including hands-on efforts to reach those at high risk of an overdose or venues where they could be located) (1 strategy); 2: MOUD expansion, linkage, and retention (3 strategies); 3: SPDP (1 strategy). Five strategies were specified as the minimum needed to reduce overdose deaths, with three allotted to MOUD, given its importance in protecting individuals from overdose (Winhusen et al 2020). Further, community coalitions were required to implement at least one EBP strategy in each of three key sectors (behavioral health, criminal justice, and healthcare). One state (KY) also set a maximum of twelve strategies per coalition for initial action plans, requiring no more than three strategies

involving OEND; two each involving MOUD expansion, linkage, and retention; and three involving SPDP. Additional strategies could be added later.

Communities used a variety of tools in selecting strategies (Young et al., 2022) which were guided by data-identified gaps in EBP availability and feasibility of sustaining strategies long term. Thus, the details provided in community action plans varied among sites. For example, KY action plans included strategies with multiple venues for implementation within a sector (e.g., active OEND in criminal justice settings could include jails, probation, drug court). In NY and OH, action plans were specific to named service organizations where EBPs would be implemented (e.g., OEND in the county jail, OEND in the drug court as separate strategies). These differences did not impact data collection methods for this study.

2.3 Data collection

The ORCCA Tracker (ORCCAT), a REDCap instrument capturing data on selected strategies across menus was the primary data source. HCS staff entered ORCCAT data into site-specific REDCap databases that were securely transferred to the HCS Data Coordination Center (DCC) for processing and analysis. Data fields utilized for the present analysis include the menu strategies (See Table 1), sector (behavioral health, criminal justice, and healthcare), and type of venue (See Table 2). For Menu 2, data on medications included in MOUD strategies (methadone, buprenorphine, or naltrexone) were also collected.

2.4 Sample

The study sample included 33 of 34 Wave 1 communities (for a list of Wave 1 communities see Walsh et al., 2020). Following initial interest, one community decided not to participate in the HCS and withdrew from the study post randomization but prior to CTH intervention initiation. Strategies defined in initial community action plans approved by community coalitions between August and November 2020 were analyzed. Each EBP strategy is identified by a linked strategy-sector-venue triad combination (henceforth referred to as "triad"). Triads comprise the units for analysis and allow for consistent strategy selection reporting across sites.

2.5 Covariate definitions

A community's baseline opioid overdose death rate is defined as the median of its 2018 - 2020 death rate per 100,000 population; communities with a death rate less than the median across the 33 communities are defined as having a "lower" rate, versus those greater than the sample median defined as having a "higher" rate. Community designation as rural versus urban in NY, KY, and OH is based on Center for Disease Control and Prevention National Center for Health Statistics codes (Ingram and Franco, 2013). It was not possible to apply these codes in MA, where communities with a density less than 500 individuals per square mile were designated rural (Walsh et al., 2020). The main trial's covariate-constrained randomization approach ensured balance between Wave 1 and Wave 2 communities on opioid overdose death rate, population size, and rural versus urban status within site (Walsh et al., 2020).

2.6 Analytic approach

This analysis is primarily descriptive and hypothesis-generating. Counts and proportions of triads within EBP menu, sector and venue are reported both overall and within strata of site, setting, and opioid overdose death rate. ORCCA strategy selection requirements vary between menus (e.g., one for OEND and three for MOUD) and between submenus (e.g., one for Active OEND and zero for Optional OEND). Using the absolute number of strategies selected for comparison would not reflect community preference since some of the choices were required; thus, the number of strategies exceeding minimum requirements was utilized in analyses. Triads exceeding the required minimum number are summarized within the menus using counts and proportions. Statistical testing evaluated two *a priori* hypotheses: 1) whether the proportion of MOUD strategies selected beyond the required minimum is higher among urban relative to rural settings; and 2) whether the proportion of OEND strategies selected beyond the required minimum is higher among communities with high versus low opioid-involved overdose deaths. Statistical comparisons for the two *a priori* hypotheses were performed using combined ratio estimate procedures (Sarndal et al., 1992), while adjusting for site. A p-value of less than 0.05 was considered a statistically significant result. All analyses were performed using *SAS* (*v.9.4,* Cary, NC), except for the adjusted statistical testing, which was performed using *SUDAAN's* Ratio procedure (*Release 11.0.1,* Research Triangle Institute).

3.0 Results

3.1 ORCCA menu selection beyond the minimum required

3.1.1 Overall—Selection of the five ORCCA-required strategies in 33 communities would result in a minimum of 165 strategies (33 OEND, 99 MOUD, and 33 SPDP). All communities exceeded ORCCA requirements resulting in 618 selected strategies (see Table 3), 453 (275%) more than the number required. Of the strategies exceeding the minimum, OEND strategies accounted for the most (185; 40.8%), followed by MOUD (159; 35.1%) and SPDP (109; 24.1%) strategies.

3.1.2 Sites—The number and pattern of strategies selected beyond the minimum differed across study sites. In KY, MA, and NY, OEND and MOUD were selected more frequently than SPDP, whereas in OH, OEND was selected most frequently, followed by SPDP, and then MOUD strategies (See Table 3).

3.1.3 Urban vs Rural—There was good site balance for rural vs. urban communities except for MA which had only two communities classified as rural. OEND strategies represented a greater proportion of strategies selected beyond the required minimum in rural (46.9%) than urban (36.2%) communities. MOUD strategies represented a numerically greater proportion of strategies selected beyond the required minimum in urban (38.1%) relative to rural (31.1%) communities, although the difference, adjusting for site, was not statistically significant (p= 0.130).

3.1.4 Opioid Overdose Deaths per 100k—The median overdose death rate across the 33 communities was 30.91 per 100,000 population, and opioid death rates varied by site. All

eight NY communities had death rates below the overall median, while seven of KY's eight communities and six of MA's eight communities had death rates above the median. MOUD (36.7% vs. 33.9%) and SPDP (25.5% vs. 23.0%) strategies were selected at similar rates by communities with lower and higher overdose death rates. OEND strategies represented a numerically greater proportion of strategies selected beyond the required minimum in communities with higher (43.2%), relative to lower (37.8%) overdose death rates, although the difference, adjusting for site, was not statistically significant (p= 0.379).

3.2 ORCCA submenu selection beyond the minimum required

3.2.1 Overall—The ORCCA submenu strategies selected beyond the required minimum are delineated in Table 3. A higher percentage of strategies to actively deliver OEND were selected compared to OEND by referral or request (68.1% versus 31.9%). MOUD strategies focused more on linking people to MOUD (44.7%) followed by expanding capacity to provide MOUD (28.9%) and engaging and retaining people on MOUD (26.4%). SPDP focused more on safer prescribing practices (67.9%) but also included safer disposal (32.1%).

3.2.2 Sites—Submenu strategies selected beyond the minimum required varied across sites. All sites selected more active OEND than other OEND strategies; KY and OH had higher percentages of active OEND versus other strategies (72.8 vs 27.2; 86.2 vs 13.8 respectively). MOUD submenus accounting for selected strategies varied from NY with the greatest proportion for Expansion (38.3%), OH the greatest proportion for Linkage (56.3%), and KY the greatest proportion for Engagement and Retention (40%) strategies. MA selected the highest proportion of required SPDP strategies (86.2%) and NY the highest proportion of optional SPDP strategies (51.9%).

3.2.3 Urban vs Rural—The pattern of submenu strategies selected beyond the required minimum was similar between rural and urban communities, except for active OEND which constituted a lower proportion of OEND strategies in rural (63.0%) compared to urban (73.1%) communities.

3.2.4 Deaths per 100k—Communities with higher, relative to lower, overdose death rates had a higher proportion of active OEND (73.9% vs. 59.5%), MOUD Engagement and Retention (33.3% vs. 18.1%) and SPDP (74.6% vs. 60.0%) strategies and fewer MOUD Expansion (24.1% vs 34.7%) and MOUD Linkage (42.5% vs. 47.2%) strategies.

3.3 Strategies by sector

3.3.1 Overall—Communities were required to select at least one strategy in each of three sectors: behavioral health, criminal justice, and healthcare. More strategies were selected for healthcare (43.4%) than for behavioral health (36.9%) or criminal justice (19.7%) sectors (see Table 4). Within behavioral health, MOUD strategies were more commonly selected (51.3%) than OEND (43.4%) or SPDP (5.3%) strategies. Within criminal justice, OEND strategies were more commonly selected (54.9%) than MOUD (41.8%) or SPDP (3.3%) strategies. Within healthcare, SPDP strategies were more commonly selected (47.0%) than MOUD (33.6%) or OEND (19.4%) strategies.

3.3.2   Sites—The pattern of strategies selected beyond the minimum required within sectors varied across sites, but within each site, strategies in behavioral health or healthcare sectors were selected more frequently than strategies in the criminal justice sector (See Table 4). Notable patterns included KY, NY, and OH had a greater percentage of MOUD strategies selected in behavioral health than OEND, and selection of SPDP was low across all 4 sites. Within justice settings OEND strategies constituted a greater percentage of strategies selected for all 4 sites and only NY and MA had any SPDP strategies selected for the criminal justice sector. Within healthcare a higher percentage of strategies were selected from MOUD and SPDP than OEND menus. NY's healthcare sector included a higher percentage of MOUD strategies than SPDP, while KY, MA, and OH's healthcare sector included a higher percentage of SPDP than MOUD strategies.

3.3.3   Urban vs Rural—The pattern of strategies selected beyond the minimum by sector was similar for rural and urban settings. The menus selected for behavioral health were similar between rural and urban communities. For criminal justice, rural communities selected more OEND (62.1%) than MOUD (36.2%) strategies, a difference not seen in urban communities (48.4% OEND vs. 46.9% MOUD). For healthcare, urban communities selected more MOUD (36.8%) than OEND (15.5%) strategies, a difference not seen in the rural communities (24.8% OEND vs. 29.2% MOUD).

3.3.4   Deaths per 100k—The pattern of strategies selected beyond the minimum by sector was similar for communities with lower and higher overdose death rates. For behavioral health, lower overdose death rate communities selected more MOUD (52.9%) than OEND (37.3%) strategies, a difference not seen in higher overdose death rate communities (48.4% OEND vs. 50.0% MOUD). For criminal justice, higher overdose death rate communities selected more OEND (58.0%) than MOUD (40.6%) strategies, a difference not seen to the same extent in lower overdose death rate communities (50.9% OEND vs. 43.4% MOUD).

3.4   MOUD medications

3.4.1   Overall—The ORCCA requires implementation of a MOUD strategy focused on partial (buprenorphine) or full agonist (methadone) medication. Naltrexone was not required but could be considered, with the extended-release injection formulation encouraged. Table 5 provides the medications targeted by strategies in each MOUD submenu. Of note, a strategy could target more than one medication. Across the MOUD submenus most strategies focused on buprenorphine (90.3%), followed by naltrexone (62.0%) and methadone (35.3%).

3.4.2   Sites—In all sites, buprenorphine was the most common medication for MOUD Expansion, Linkage, and Engagement and Retention, followed by naltrexone and methadone. There was site variability in the number of medications per MOUD strategy. OH selected fewer strategies that simultaneously included all three medications and selected more strategies focused on a single medication (See Table 5). Across all sites methadone was the least common medication included for MOUD Expansion, MOUD Linkage, and MOUD Engagement and Retention (See Table 5).

3.4.3   Urban vs Rural—There was a lower proportion of methadone-inclusive strategies in rural compared to urban communities across MOUD (25.5% vs. 42.1%), including MOUD Expansion (18.2% vs. 30.4%), and MOUD Engagement and Retention (24.2% vs. 57.1%) submenus. There was a greater proportion of buprenorphine-targeting MOUD Linkage strategies in rural (95.0%) compared to urban (85.9%) communities.

3.4.4   Deaths per 100k—There was a lower proportion of naltrexone-inclusive strategies in lower vs higher overdose death rate communities across MOUD menus (51.7% vs. 71.0%), and for the MOUD Expansion (43.9% vs. 71.1%), and MOUD Linkage (52.0% vs. 72.2%) submenus. There was a greater proportion of buprenorphine-inclusive strategies in lower vs higher overdose death rate communities for the MOUD Expansion (100.0% vs. 89.5%), and MOUD Engagement and Retention (79.3% vs. 91.3%) submenus.

4.0   Discussion

This paper examined initial EBP strategy selections in Wave 1 HCS communities. All community coalitions selected well beyond the ORCCA-required minimum of five strategies per community. HCS communities have been highly burdened by opioid overdose deaths and are highly motivated to lower these deaths. Communities identified multiple gaps in EBP implementation with many opportunities to intervene in multiple sectors and venues, which may explain the high number of strategies selected by community coalitions.

Consistent with the hypothesis, urban communities selected more MOUD strategies than rural communities, although the difference was not statistically significant controlling for site. Conversely, rural communities selected more OEND than MOUD strategies. Urban communities are likely to have more clinical settings where MOUD would be feasible (Hirchak and Murphy, 2017). Whereas, in rural communities, clinical settings are likely sparse, and the relative ease of implementing OEND may make it a more attractive choice for those community coalitions. As also hypothesized, communities with higher opioid overdose death rates selected more OEND strategies, beyond the minimum required, than communities with lower opioid overdose death rates, although this difference was not statistically significant after controlling for site. OEND can be implemented relatively rapidly which could make it a higher priority for coalitions facing higher community-level overdose deaths.

In total, OEND strategies were selected more frequently followed by MOUD and SPDP. OEND strategies require less time and resources to implement than MOUD strategies and may represent quickly mobilized efforts to combat overdoses. In contrast, MOUD implementation is more complicated, requiring change in clinical practice and challenges of technology transfer (Miller et al., 2006), as well as stigma (Madden et al., 2021). More strategies were selected related to linking people to MOUD compared to expanding MOUD. Expanding MOUD requires developing new programs or expanding existing ones, which is logistically complicated and resource intensive. Increasing linkage to existing programs was thus an easier strategy to implement. In addition, emphasis on linkage might reflect available treatment slots that are not being filled. It is important to note that while OEND is effective at reducing community-level overdose death rates (Razaghizad et al., 2021),

MOUD reduces overdose risk via multiple mechanisms including supporting abstinence and reduction in opioid use, and sustained protection against overdose through opioid tolerance and receptor blockade. Modeling has suggested, in addition to OEND, substantial increases are needed in the proportion of people with OUD who initiate and adhere to MOUD to achieve a substantial reduction in opioid overdose deaths (Linas et al, 2021).

Communities were required to implement strategies in behavioral health, healthcare, and criminal justice sectors where high numbers of people at risk of an opioid overdose death are found. More strategies were selected for healthcare, followed by behavioral health, with fewer strategies selected in criminal justice settings. Almost half the strategies selected for healthcare were for safer prescribing, consistent with its focus on encouraging medical practitioners to prescribe opioids more judiciously and promoting disposal of unused opioids. Criminal justice strategies focused more on OEND while behavioral health focused more on MOUD, except in MA. MOUD strategies may be more welcome in treatment settings where the goal is to help people enter remission and recovery. Justice settings will require education to decrease stigma and increase understanding of MOUD and either linkage to community MOUD providers or enhanced health care services within justice settings explicitly including MOUD (Lee and Rich, 2012).

The ORCCA-required MOUD strategies focus on the partial agonist buprenorphine and the full agonist methadone. Strategies for the antagonist naltrexone were supported but not required. Buprenorphine-inclusive strategies were selected most frequently, followed by naltrexone, with fewer strategies focused on methadone. Relative to methadone, buprenorphine has fewer regulatory barriers and community coalitions likely perceived it could be readily implemented across all sectors. For methadone, more strategies targeted linkage or engagement and retention in care, while fewer strategies targeted expanding the availability of methadone. Regulatory and other logistical barriers made establishing new methadone programs infeasible for many communities. Working with existing methadone programs to facilitate linkage or improve retention was more expedient. A lower proportion of methadone-inclusive strategies across MOUD submenus were selected in rural versus urban communities, which are more likely to have existing methadone programs. Fewer than half of rural counties across the U.S. have any methadone programs (Grimm, 2020). Stigma against methadone is high and may have contributed to community coalitions selecting fewer methadone-related strategies. Of the three MOUD medications research shows methadone has the strongest effectiveness and best retention in treatment (Hser et al., 2013; Mattick et al, 2014; LaRochelle et al, 2018; Burns et al, 2015). Thus, despite the noted barriers, more focus on methadone may be needed to achieve substantial reductions in opioid overdose deaths. Evidence-based models for delivering methadone as part of primary care and pharmacy-based dispensing should be considered to increase access, lower barriers, and potentially address racial and ethnic disparities (Andraka-Christou, 2021; Nunes et al, 2021).

While naltrexone was not a required medication it was a frequently included MOUD strategy, particularly in communities with higher overdose death rates. Naltrexone has the fewest regulatory barriers. As an antagonist with no opioid-like effects, it may be less stigmatized and more acceptable in settings where there may be philosophical opposition to

agonist or partial agonist medications including criminal justice, some addiction treatment programs, and some in the recovery community. Extended-release naltrexone has been shown in clinical trials to have six-month effectiveness and treatment retention close to that of buprenorphine (Lee et al, 2018; Tanum et al, 2017). However, naltrexone is more difficult to initiate than buprenorphine or methadone, and in community practice has lower retention rates and no evidence of reducing overdoses (LaRochelle et al., 2018; Wakeman et al., 2020). Thus, for patients choosing naltrexone, strategies to improve ease of initiation, retention in treatment, and switching to other forms of MOUD will be particularly important.

4.1 Limitations

The data reported here are limited to strategies chosen by the HCS community coalitions during the initial planning phase. Data do not reflect the implementation process or the extent to which strategies succeeded or failed. The data are descriptive and exploratory; two a priori hypotheses were prioritized building on previous research. The decision to limit the number of hypotheses was based on concerns about Type I error and power with a sample size of 33 communities which would have been challenged by multiple comparison adjustments for additional hypothesis testing. Comparisons of strategy frequencies across communities is complicated because a reported strategy might reflect a circumscribed effort at one community venue, or a larger effort coordinated across multiple venues. Sites differed in strategy-selection approach, with a wide range in the number of strategies selected, complicating interpretation of site differences. In addition, descriptive results comparing sites or communities with high/low opioid overdose death rates need to be interpreted with caution since opioid overdose death rates varied by site and differences could reflect differences in sites, such as state naloxone policies (Bohler et al., 2023) rather than opioid overdose death rates. Community characteristics were restricted to urban vs rural status, burden of opioid overdose deaths, and site. Future research should examine selection and implementation of EBPs as a function of other key community characteristics including social determinants of health like sober housing availability, structural racism, etc.

5.0 Conclusions

Our descriptive analysis indicates HCS Wave 1 communities selected nearly four times the required number of EBP strategies, likely reflecting the perceived magnitude of the opioid epidemic, multiple opportunities to intervene, and high community coalition commitment. Although the ORCCA requires three of the five minimum strategies to focus on MOUD, more strategies focused on OEND. Within MOUD, more strategies focused on referral or linkage, than on expanding MOUD services. More strategies focused on buprenorphine or naltrexone with the fewest focused on methadone, especially few on methadone expansion. OEND is less complicated to implement and may face less stigma and misunderstanding compared to MOUD. Expanding existing MOUD services or building new ones is time and resource intensive especially for methadone. Overall, more strategies were selected in behavioral health or general healthcare settings with the fewest selected in criminal justice settings, where stigma and logistical barriers are greatest. Future work will examine the implementation, reach, and sustainability of selected EBPs.

Acknowledgments

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Highlights

The Helping End Addictions Long Term (HEALing) Communities Study (HCS) seeks to significantly reduce overdose deaths in 67 highly impacted communities in Kentucky (KY), Massachusetts (MA), New York (NY), and Ohio (OH) by implementing evidence-based practices (EBPs) to reduce overdose deaths. The Opioid-overdose Reduction Continuum of Care Approach (ORCCA) organizes EBP strategies under three menus: Overdose Education and Naloxone Distribution (OEND), Medication Treatment for Opioid Use Disorder (MOUD), and Safer Prescribing and Dispensing Practices (SPDP). The ORCCA sets requirements for strategy selection but allows flexibility to address community needs. This paper describes and compiles strategy selection and examines two hypotheses: 1) OEND selections will differ significantly between communities with higher versus lower opioid-involved overdose deaths; 2) MOUD selections will differ significantly between urban versus rural settings.

Table 1.

The Opioid-overdose Reduction Continuum of Care Approach Menu of Evidence Based Practices

Menu 1: Overdose education and naloxone distribution (OEND)
Active OEND (one required)

- Active OEND to at-risk individuals and their social networks
- Active OEND at high-risk venues

Passive OEND (optional)

- OEND by referral
- OEND self-request
- Naloxone availability for immediate use in overdose hotspots

Naloxone Administration (optional)

- Capacity for first responder administration

Menu 2: Effective Delivery of MOUD (including agonist / partial agonist)
Expand MOUD Treatment Availability (one required)

- Primary care, general medical/behavioral health settings, substance use disorder treatment settings
- Criminal justice settings (pre-trial, jail, prison, probation, parole)
- Telemedicine, interim buprenorphine or methadone or medication units

Linkage to Services (one required)

- Linkage programs (all relevant settings)
- Bridging MOUD medications as linkage adjunct (all relevant settings)

Treatment Engagement and Retention (one required)

- Enhancement of clinical treatment delivery approaches
- Use of virtual retention approaches
- Utilization of retention care coordinators and/or peer navigation
- Integration of mental health and polysubstance use treatment with MOUD care
- Reduction of barriers to housing and accessing other community benefits for people with OUD

Menu 3: Safer Opioid Prescribing/Dispensing
Safer Opioid Prescribing /Dispensing Practices (one required)

- Safer opioid prescribing for acute pain across varied healthcare settings
- Safer opioid prescribing for chronic pain
- Safer opioid dispensing

Safer Opioid Disposal Practices (optional)

- Prescription drug drop-box / mail-back programs

Table 2.

Choices of Venue in the ORCCA Tracker

1.	Criminal Justice - Jails
2.	Criminal Justice - Community Supervision (probation, parole)
3.	Criminal Justice – Other
4.	Syringe Service Programs
5.	Healthcare – Emergency Department
6.	Healthcare – Health Department
7.	Healthcare – Pharmacy
8.	Healthcare – Inpatient Services
9.	Healthcare – Outpatient Clinics
10.	Healthcare – Ambulatory Surgery
11.	Healthcare – Dental Clinics
12.	Healthcare – Other
13.	First Responder Stations (e.g., police and fire stations)
14.	Addiction Treatment and Recovery Facilities- Medical
15.	Addiction Treatment and Recovery Facilities- Non-Medical
16.	Mental/Behavioral Health Treatment Facilities- Medical
17.	Mental/Behavioral Health Treatment Facilities-Non-Medical
18.	Community-Based Social Service Agencies-Homeless Shelters
19.	Community-Based Social Service Agencies-Half-Way Houses
20.	Community-Based Social Service Agencies-Other
21.	Hotline (Phone or Internet) Responding To Service Requests
22.	Other (Specify)

Table 3.

Strategy selection beyond the minimum required by site, setting, and opioid-related deaths per 100,000 population

	Study Sites				Setting		Deaths per 100 k [a]		Total
	KY	MA	NY	OH	Rural	Urban	<30.91	>30.91	
Number of Communities	8	8	8	9	15	18	16	17	33
Strategies Selected, n	217	133	156	112	271	347	276	342	618
Strategies Selected beyond the minimum required [b]	177 (81.6)	93 (69.9)	116 (74.4)	67 (59.8)	196 (72.3)	257 (74.1)	196 (71.0)	257 (75.1)	453 (73.3)
OEND [b]	81 (45.8)	33 (35.5)	42 (36.2)	29 (43.3)	92 (46.9)	93 (36.2)	74 (37.8)	111 (43.2)	185 (40.8)
Active OEND [c]	59 (72.8)	18 (54.5)	24 (57.1)	25 (86.2)	58 (63.0)	68 (73.1)	44 (59.5)	82 (73.9)	126 (68.1)
Optional OEND [c]	22 (27.2)	15 (45.5)	18 (42.9)	4 (13.8)	34 (37.0)	25 (26.9)	30 (40.5)	29 (26.1)	59 (31.9)
MOUD [b]	65 (36.7)	31 (33.3)	47 (40.5)	16 (23.9)	61 (31.1)	98 (38.1)	72 (36.7)	87 (33.9)	159 (35.1)
Expansion [d]	15 (23.1)	8 (25.8)	18 (38.3)	5 (31.3)	18 (29.5)	28 (28.6)	25 (34.7)	21 (24.1)	46 (28.9)
Linkage [d]	24 (36.9)	13 (41.9)	25 (53.2)	9 (56.3)	25 (41.0)	46 (46.9)	34 (47.2)	37 (42.5)	71 (44.7)
Engagement/retention [d]	26 (40.0)	10 (32.3)	4 (8.5)	2 (12.5)	18 (29.5)	24 (24.5)	13 (18.1)	29 (33.3)	42 (26.4)
Safer Prescribing/ Dispensing [b]	31 (17.5)	29 (31.2)	27 (23.3)	22 (32.8)	43 (21.9)	66 (25.7)	50 (25.5)	59 (23.0)	109 (24.1)
Required [e]	23 (74.2)	25 (86.2)	13 (48.1)	13 (59.1)	30 (69.8)	44 (66.7)	30 (60.0)	44 (74.6)	74 (67.9)
Optional [e]	8 (25.8)	4 (13.8)	14 (51.9)	9 (40.9)	13 (30.2)	22 (33.3)	20 (40.0)	15 (25.4)	35 (32.1)

[a] Each community's death rate is the median of its 2018, 2019, 2020 yearly rates.

[b] n (%) of total selected strategies that are beyond the minimum of 5 per community;

[c] n (%) of strategies beyond the minimum that are OEND;

[d] n (%) of strategies beyond the minimum that are MOUD;

[e] n (%) of strategies beyond the minimum that are safer prescribing.

Table 4.

Strategy sector selection by site, setting, and opioid-related deaths per 100,000 population

	Study Sites				Setting		Deaths per 100 k [a]		Total
	KY	**MA**	**NY**	**OH**	**Rural**	**Urban**	**<30.91**	**>30.91**	
Number of Communities	**8**	**8**	**8**	**9**	**15**	**18**	**16**	**17**	**33**
Strategies Selected, n	**217**	**133**	**156**	**112**	**271**	**347**	**276**	**342**	**618**
Behavioral Health [b]	**92 (42.4)**	**41 (30.8)**	**62 (39.7)**	**33 (29.5)**	**100 (36.6)**	**128 (36.9)**	**102 (37.0)**	**126 (36.8)**	**228 (36.9)**
OEND[c]	44 (47.8)	23 (56.1)	22 (35.5)	10 (30.3)	43 (43.0)	56 (43.8)	38 (37.3)	61 (48.4)	99 (43.4)
MOUD[c]	48 (52.2)	17 (41.5)	32 (51.6)	20 (60.6)	52 (52.0)	65 (50.8)	54 (52.9)	63 (50.0)	117 (51.3)
SPDP[c]	0 (0.0)	1 (2.4)	8 (12.9)	3 (9.1)	5 (5.0)	7 (5.5)	10 (9.8)	2 (1.6)	12 (5.3)
Criminal Justice [b]	**53 (23.5)**	**14 (10.5)**	**33 (21.2)**	**24 (21.4)**	**58 (21.4)**	**64 (18.4)**	**53 (19.2)**	**69 (20.2)**	**122 (19.7)**
OEND[d]	28 (54.9)	8 (57.1)	16 (48.5)	15 (62.5)	36 (62.1)	31 (48.4)	27 (50.9)	40 (58.0)	67 (54.9)
MOUD[d]	23 (45.1)	5 (35.7)	14 (42.4)	9 (37.5)	21 (36.2)	30 (46.9)	23 (43.4)	28 (40.6)	51 (41.8)
SPDP[d]	0 (0.0)	1 (7.1)	3 (9.1)	0 (0.0)	1 (1.7)	3 (4.7)	3 (5.7)	1 (1.4)	4 (3.3)
Healthcare [b]	**74 (34.1)**	**78 (58.6)**	**61 (39.1)**	**55 (49.1)**	**113 (41.7)**	**155 (44.7)**	**121 (43.8)**	**147 (43.0)**	**268 (43.4)**
OEND[e]	17 (23.0)	10 (12.8)	12 (19.7)	13 (23.6)	28 (24.8)	24 (15.5)	25 (20.7)	27 (18.4)	52 (19.4)
MOUD[e]	18 (24.3)	33 (42.3)	25 (41.0)	14 (25.5)	33 (29.2)	57 (36.8)	43 (35.5)	47 (32.0)	90 (33.6)
SPDP[e]	39 (52.7)	35 (44.9)	24 (39.3)	28 (50.9)	52 (46.0)	74 (47.7)	53 (43.8)	73 (49.7)	126 (47.0)

[a] Each community's death rate is the median of its 2018, 2019, 2020 yearly rates.

[b] n (%) of strategies selected;

[c] n (%) of strategies in the behavioral health sector;

[d] n (%) of strategies in the criminal justice sector;

[e] n (%) of strategies in the healthcare sector

Table 5.

MOUD strategy medications by site, setting, and opioid-related deaths per 100,000

	Study Sites				Setting		Deaths per 100 k [a]		Total
	KY	MA	NY	OH	Rural	Urban	<30.91	>30.91	
Number of Communities	8	8	8	9	15	18	16	17	33
Strategies Selected, n	89	55	71	43	106	152	120	138	258
Medications across MOUD strategies [b]									
Buprenorphine [b]	85 (95.5)	51 (92.7)	68 (95.8)	29 (67.4)	97 (91.5)	136 (89.5)	109 (90.8)	124 (89.9)	233 (90.3)
Methadone [b]	25 (28.1)	27 (49.1)	36 (50.7)	3 (7.0)	27 (25.5)	64 (42.1)	42 (35.0)	49 (35.5)	91 (35.3)
Naltrexone [b]	71 (79.8)	36 (65.5)	41 (57.7)	12 (27.9)	65 (61.3)	95 (62.5)	62 (51.7)	98 (71.0)	160 (62.0)
Expand MOUD Availability [b]	**23 (25.8)**	**16 (29.1)**	**26 (36.6)**	**14 (32.6)**	**33 (31.1)**	**46 (30.3)**	**41 (34.2)**	**38 (27.5)**	**79 (30.6)**
Buprenorphine [c]	22 (95.7)	15 (93.8)	26 (100.0)	12 (85.7)	32 (97.0)	43 (93.5)	41 (100.0)	34 (89.5)	75 (94.9)
Methadone [c]	3 (13.0)	4 (25.0)	12 (46.2)	1 (7.1)	6 (18.2)	14 (30.4)	12 (29.3)	8 (21.1)	20 (25.3)
Naltrexone [c]	18 (78.3)	10 (62.5)	13 (50.0)	4 (28.6)	18 (54.5)	27 (58.7)	18 (43.9)	27 (71.1)	45 (57.0)
Linkage to MOUD [b]	**32 (36.0)**	**21 (38.2)**	**33 (46.5)**	**18 (41.9)**	**40 (37.7)**	**64 (42.1)**	**50 (41.7)**	**54 (39.1)**	**104 (40.3)**
Buprenorphine [d]	30 (93.8)	20 (95.2)	32 (97.0)	11 (61.1)	38 (95.0)	55 (85.9)	45 (90.0)	48 (88.9)	93 (89.4)
Methadone [d]	12 (37.5)	9 (42.9)	17 (51.5)	1 (5.6)	13 (32.5)	26 (40.6)	17 (34.0)	22 (40.7)	39 (37.5)
Naltrexone [d]	28 (87.5)	12 (57.1)	21 (63.6)	4 (22.2)	24 (60.0)	41 (64.1)	26 (52.0)	39 (72.2)	65 (62.5)
MOUD Engagement and Retention [b]	**34 (38.2)**	**18 (32.7)**	**12 (16.9)**	**11 (25.6)**	**33 (31.1)**	**42 (27.6)**	**29 (24.2)**	**46 (33.3)**	**75 (29.1)**
Buprenorphine [e]	33 (97.1)	16 (88.9)	10 (83.3)	6 (54.5)	27 (81.8)	38 (90.5)	23 (79.3)	42 (91.3)	65 (86.7)
Methadone [e]	10 (29.4)	14 (77.8)	7 (58.3)	1 (9.1)	8 (24.2)	24 (57.1)	13 (44.8)	19 (41.3)	32 (42.7)
Naltrexone [e]	25 (73.5)	14 (77.8)	7 (58.3)	4 (36.4)	23 (69.7)	27 (64.3)	18 (62.1)	32 (69.6)	50 (66.7)

MOUD= Medication for opioid use disorder;

[a] Each community's death rate is the median of its 2018, 2019, 2020 yearly rates.

[b] n (%) of all MOUD strategies;

[c] n (%) of MOUD expansion strategies;

[d] n (%) of MOUD linkage strategies;

[e] n (%) of MOUD engagement and retention strategies;

[e] Type of MOUD under bold faced header are not additive since a strategy could include multiple medications