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JCOIN 2.0 TCU Hub: Building Resilient Initiatives for Deflection through Greater Engagement (BRIDGE)

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Abstract

Background: Collaborative initiatives between public safety and health sectors have been implemented to reduce arrests, overdose deaths, and with emergency medical services (EMS) encounters. These efforts include community-based Deflection initiatives designed to "deflect" individuals away from initial or continued involvement with the criminal legal system (CLS) and toward substance use (SU) treatment services. Although Deflection is widely regarded as a promising practice, barriers to adopting Deflection are well documented. More research is needed to identify the implementation strategies most likely to overcome barriers to produce and sustain positive outcomes. The JCOIN 2.0 TCU Hub study, called the TCU BRIDGE to Deflection Project, addresses this clinical practice and research gap by testing strategies that integrate community engagement as a core component of generalizable Deflection models designed to meet the complex needs of individuals with SU problems, particularly those at high risk of overdose.

Methods: The study uses a Hybrid Type 3 design to test two community engagement strategy bundles to promote Deflection. The CORE bundle includes facilitated public health-public safety interagency collaboration, best practices on building community engagement, and cross-system, data-driven learning. The ENHANCED bundle includes the CORE components, plus strategic role development and coaching for a known and trusted community member within each community to strengthen community support for Deflection efforts and promote meaningful engagement in Deflection leadership decisions. The study uses a staggered, parallel cluster randomized trial and will include up to 20 communities across six states. Each community includes law enforcement agencies engaged in existing Deflection efforts, along with community-based SU providers who serve Deflection participants.

Discussion: Guided by the Exploration, Preparation, Implementation, and Sustainment (EPIS) Implementation Science Framework, this initiative is positioned to create a lasting contribution to the SU and CLS research fields by advancing knowledge of effective implementation strategies involving community engagement in Deflection in an effort to improve public safety and health outcomes.

Trials registration number (TRN): NCT07528846; date of registration: 3/30/2026

Background

There is a critical need for rigorous studies that test implementation strategies to prevent opioid-related morbidity and mortality among individuals at risk of criminal legal system (CLS) involvement. The U.S. overdose crisis continues to wreak havoc on communities, with 79,384 overdose deaths reported in 2024 involving illicit opioids and/or stimulants (Garnett & Minino, 2026). Over half of individuals with opioid use disorders report involvement in the CLS (Winkelman et al., 2018), and drug-related offenses account for a quarter of all annual arrests (National Center for Drug Abuse Statistics, 2024). CLS involvement often exacerbates negative outcomes for these individuals, such as arrest and incarceration leading to job loss, financial instability (Nam-Sonenstein, 2024; Bergin et al., 2022), and an increased risk of overdose and death (Brinkley-Rubinstein et al., 2018). As highlighted by The Prison Policy Initiative

(Nam-Sonenstein, 2024), "Reforms that prevent as many people as possible, as early as possible, from being detained can have significant, positive downstream effects on public safety."

To address this crisis, novel collaborative efforts between public safety and health sectors have been implemented, including *Deflection* initiatives (SAMHSA, nd). These programs aim to "deflect" individuals away from initial or further involvement with the CLS and toward substance use (SU) treatment services in the community (Labriola et al., 2023), ultimately working to reduce overdose deaths (Bailey et al., 2023) and encounters with emergency medical services (EMS). Within the Sequential Intercept Model (SIM), *Deflection* initiatives are positioned to provide early, upstream interventions (Intercepts 0–1; SAMHSA, 2024), with referrals to treatment initiated by individuals themselves, first responders/officers, or community members. These programs typically involve immediate, active outreach and/or responses to overdoses, followed by referrals to *Deflection* services – intervening during the earliest opportunity for intervention before CLS involvement, and serving as an innovative and promising strategy to enhance public safety and reduce recidivism by connecting individuals to treatment and avoiding consequences of CLS involvement (Charlier & Reichert, 2020).

Engaging communities in *Deflection* is crucial for their effectiveness at addressing underlying causes of SU and criminal behavior as it can build trust and buy in and increase the likelihood that responses are culturally appropriate and draw on local resources. Collaboration among diverse stakeholders, such as law enforcement (LE), public health professionals, and community organizations, enhances the understanding of public safety and public health challenges and supports the creation of tailored strategies to address them in ways that are more effective and sustainable. As (Micah et al., 2023) indicates, partnerships between LE and community stakeholders should involve implementing, monitoring and evaluating these types of initiatives as a shared responsibility.

A significant challenge lies in prioritizing community engagement as a fundamental component of research and demonstrating its impact through innovative assessment methods (SAMHSA, 2022). While community engagement is recognized as a key principle in implementation science (Meissner et al., 2020), there remains a limited understanding of which specific methods and approaches yield the most effective outcomes (particularly with respect to core components of generalizable *Deflection* models for SIM Intercepts 0–1).

Achieving community buy-in for *Deflection* is further complicated by negative attitudes among key groups, including LE officers, individuals referred to *Deflection*, community service providers, public health agencies, and the community at large. These negative attitudes can impede a community's adoption of *Deflection* practices, equitable participation by referred individuals (Bayer et al., 2024), and broader community support, including engagement from a wider network of public health providers.

Community engagement alone, however, may not suffice to promote the adoption of *Deflection* approaches. Findings from the National Institute on Drug Abuse (NIDA) HEALing Communities Study emphasizes that even when communities are engaged, there is a critical need for trusted citizens to advocate for change (Walters et al., 2024). As "credible messengers," individuals with direct or indirect

experiences with the CLS and/or SU, hold significant potential to serve as community advocates for *Deflection* initiatives by playing an active role in shaping leadership decisions and engaging the public to build support (Rami et al., 2021). In short, they are uniquely equipped to serve as "community engagement specialists (CES)" by contributing valuable insights, such as identifying needs of *Deflection* participants and helping to identify gaps in community services. By collaborating with top-level advisory stakeholders, they also can effectively advocate for public health and public safety priorities, enhancing the overall impact and success of *Deflection*. The study will provide a better understanding if involving these CES citizens in the implementation and sustainment of change efforts can lead to enhanced community awareness of *Deflection*, more effective tailored interventions, and greater diversity of perspectives.

While the barriers to adopting *Deflection* are well-documented and *Deflection* is widely regarded as a promising practice, there remains a significant need for research focused on identifying the most effective implementation strategies that contribute to sustained positive outcomes. The design addresses this clinical practice and research gap by emphasizing initiatives that incorporate community engagement and advocacy as core components of generalizable *Deflection* models designed to meet the complex needs of individuals with SU problems, particularly those at high risk of opioid, stimulant, and other SU overdose.

Aim

The primary aim is to test the implementation-effectiveness of 2 strategy bundles to promote *Deflection* models through a CORE community engagement bundle (designed to facilitate community stakeholder engagement) and ENHANCED community engagement bundle (CORE plus a component to systematically involve community advocates) on improving implementation as well as public safety and health outcomes.

Methods/Design

The proposed multi-site, multi-state Hybrid Type 3 study will focus on 1) exploring the implementation of bundled strategies to increase community involvement in *Deflection* by incorporating impacted community members, advocates, and engagement specialists as core components of the *Deflection* model, and 2) studying individuals involved with SU before they become engaged (or further engaged) in the CLS. Involving community members (including individuals with lived experience) throughout all study phases is a key component of the community engagement strategy bundles.

Setting

The study includes a total of 20 geographically distinct clinical research performance sites (i.e., 20 communities). These sites span 6 states (New Mexico, Illinois, Wisconsin, Colorado, Pennsylvania, and

Texas) and the inclusion of key CLS and Community Behavioral Health (CBH) stakeholders within each community. The justice setting is comprised of community LE agencies (police, sheriff, district attorney) involved in *Deflection* services, and community-based SU providers who serve (or potentially could serve) *Deflection* participants. The goal of including up to 20 participating communities is necessary in order to provide the project with an opportunity to examine a representative sample of existing *Deflection* models, across communities that vary in geographics, population characteristics, and resource allocation. These communities also were selected to allow results to generalize to the larger set of *Deflection* programs that currently exist across the US.

Study Design

The scientific rigor of the TCU Building Resilient Initiatives for Deflection through Greater Engagement (BRIDGE) project is based, in part, on the Hybrid Type 3 design (Curran et al., 2012), with a primary aim to test the implementation-effectiveness of 2 community engagement strategy bundles to promote and support *Deflection*. This includes a CORE bundle (designed to facilitate community stakeholder engagement) and an ENHANCED bundle (CORE plus a component to systematically involve community advocates in community engagement) on improving implementation as well as public safety and health outcomes. The study design includes random assignment at the community level (communities assigned to one of 2 study arms) and integrates 2 robust methodologies—a parallel design and cluster randomization. Referred to as a "staggered parallel cluster randomized trial" (Hemming et al., 2014), the integrated design will first assign communities to one of 2 start times (Wave) based on an assessment of community readiness (i.e., ability to prioritize system change). Communities within each Wave will then be assigned randomly to receive one of the 2 implementation strategy bundles (CORE or ENHANCED), resulting in 4 Blocks that each include 4–5 communities. Each community is considered a Cluster because agencies, *Deflection* workforce, *Deflection* participants, and Community Members/Citizens are nested within systems (or communities).

Implementation Science Framework

The scientific premise of our study is strengthened by use of the EPIS Implementation Science Framework (Exploration, Preparation, Implementation, and Sustainment; Aarons et al., 2011) to guide development and implementation of the 2 system-level implementation interventions (CORE and ENHANCED); similar to previous studies (Becan et al., 2018). EPIS allows for examination of a change process at multiple levels, across time, and through 4 successive phases: *Exploration* (assessing system, organization, provider, and client-level factors that explain service gaps and potential barriers/facilitators for change); *Preparation* (using that awareness to develop plans for improved service availability); *Implementation* (training and coaching of practices to be adopted); and *Sustainment* (maintaining the use of the newly installed practices). Organizations that engage in thoughtful decision making to address barriers and bolster strengths tend to advance to Implementation of new practices (Becan et al., 2020; Wiese et al., 2024), bringing improvements in client care (Knight et al., 2022; Belenko et al., 2022). The

CORE and ENHANCED strategy bundles for the BRIDGE project are mapped onto the 4 EPIS phases to reflect optimal bundling of these discrete and complementary strategies. The study approach will examine how building community engagement (CORE) and advocacy (ENHANCED) has the potential to support implementation and clinical outcomes across each EPIS phase (see Fig. 1).

(Fig. 1 here)

For example, community engagement and community member advocacy during *Exploration* helps identify the most pressing needs related to individuals in need; *Preparation* helps enrich proposed solutions and identify risks, *Implementation* helps harness varying perspectives and energy of citizens to deploy plans, and *Sustainment* helps identify impact and sustainability.

Intervention: CORE Community Engagement Strategy Bundle

Pre-Implementation Activities (6 months). This phase will include extraction of existing public health and safety data, assignment of communities to start Wave (based on community readiness).

Exploration and Preparation Activities (6 months). This phase includes the following key components (equating to 3–4 interagency meetings): (1) Creation of a *Deflection* Advisory Group (DAG) within each community that is comprised of at least 6 individuals (LE agency leadership, LE agency line staff, CBH leadership, CBH line staff, a health professional, and an at-large community member (community member); (2) Identification of a DAG Liaison within the DAG who has ability to make necessary resource and/or procedural changes and oversee implementation (e.g., a *Deflection* Coordinator); (3) Conduct a Needs Assessment focus group (Bowser et al., 2018) with the DAG that documents agency roles, service and linkage gaps, community engagement barriers and facilitators, and community involvement (followed by randomization of community to CORE or ENHANCED implementation bundle); (4) Develop a Resource Network List of potential CBH and service agencies for *Deflection* participant referral in the community; (5) Conduct Listening Sessions (Ardoin et al., 2022) by trained facilitators as a one 1-hour informal session where community members will have an opportunity to express attitudes about *Deflection* and awareness of the *Deflection* program; (6) Provide a Community Engagement Training to inform DAG members on the (a) importance of community engagement in promoting *Deflection* efforts, and (b) strategies to involve community citizens (including people with lived experience) in increasing awareness and support of *Deflection* initiatives, non-profit agencies, and other credible messengers in planning and implementation efforts, and (c) supporting community collaboration of partner agencies to widen the *Deflection* workforce and referral sources including LE and other first responders, treatment, and advocacy organizations; and (7) Provide Process Improvement Planning to the DAG as a meeting that includes a community specific feedback report summarizing all community data (citizen, deflection participants, workforce) collected to help co-design a goal and action plan with the DAG specifically tailored to address community specific needs.

Implementation activities: Phase 1 (6 months). Ongoing collaboration of interagency workgroups is imperative to promote system improvement. During Implementation Phase 1, DAGs will meet monthly (Leukefeld et al., 2017) to (a) document, monitor, and implement the community action plan as developed during the final step of the Preparation phase; specifically, implementation of the community engagement strategies. Many communities have existing workgroups that meet monthly to discuss *Deflection*. Additionally, each community will receive Coaching by a member of the research team with expertise in supporting community-based system change efforts (Wiese et al., 2024). The twice monthly coaching sessions will occur as (1) part of the DAG meeting (mentioned above) whereby the Coach will support plans for community engagement through skill training on interagency collaboration, assist with data monitoring (e.g., defining outcomes, output formatting, interpreting results), and address barriers toward implementing their action plan; and (2) as a 30-minute remote coaching session through phone and/or email contact prior to each DAG meeting between the DAG Liaison and Coach to set agenda items for the DAG meeting, resolve interpersonal/team issues, develop plans for agency rollout of community engagement plans, and conduct implementation checkpoints to document action plan achievement (i.e., completion of community engagement goals).

Implementation activities: Phase 2 (6 months). During this phase, communities will continue all activities as described for Implementation Phase 1 with the exception of an adaptive component that will adjust frequency of Coaching based on community responsiveness. Community responsiveness is based on completion of activities on their community action plan. Responsive communities will taper off to one Coaching session per month (the 1–1 coaching session with the DAG Liaison); with availability of the coach to attend DAG meetings upon DAG request. Non-responsive communities will continue to receive twice monthly coaching as outlined in Implementation Phase 1; as well as a booster session on the Community Engagement Training sessions and pamphlets.

Sustainment activities (12 months). This phase will start with a Sustainment Planning Meeting as attended by the Coach and DAG members. This meeting will review progress toward their community goal and planned sustainment of community engagement efforts. Following the Sustainment Planning Meeting, coaching will cease and the DAG will be encouraged to continue meeting (including trainings, service implementation, monitoring outcomes, adapting procedures) as they see fit. A member of the research team will conduct a brief Implementation Checkpoint, as a 15-minute call or e-mail contact with the Community Liaison once a month to document progress toward community engagement goals and sustainability of plans including training new hires, documenting procedures, and developing/enacting plans. At end of Sustainment, there will be a 1-hour virtual Community Needs Assessment focus group on DAG member attitudes toward the strategies utilized across the EPIS phases and perceived successes and challenges in implementing community engagement principles; as well as a final Listening Session to see if citizen attitudes have changed since the Exploration phase.

Intervention: ENHANCED Community Engagement Strategy Bundle

Communities randomized to the ENHANCED Implementation Condition will engage in the same activities as Communities in the CORE Implementation Condition, with additional activities that involve strategic role development and coaching of a CES to promote change on behalf of the community; within each phase of the EPIS framework.

Exploration and Preparation activities. The CES will be identified by the DAG members as an individual who has community competence of the neighborhoods within the community through lived experience, work experience, or close personal experience, and who serves as a credible messenger (trusted and respected individual) to the citizens and community stakeholders. The CES will serve as a DAG member with an opportunity to fully engage in *Deflection* leadership decisions and have a lead role in promoting community support of *Deflection* efforts (schedule community engagement events, work the event, network for key stakeholders). Individuals serving in the CES role will be compensated by the BRIDGE project for their time; compensation will cease at end of the Implementation phase. During the Exploration phase, the CES will engage in a 4-session highly interactive CES Training. Offering the training during Exploration will help build confidence and skills for the CES to fully engage in the DAG meeting to develop goals and action plans. The CES Training will include (1) a Background on public health and public safety systems and how to identify stakeholders that can support deflection; (2) Importance of promoting *Deflection* efforts and the CES role (3) Core advocacy skills (e.g., storytelling to inform and motivate citizen and stakeholder involvement by generating empathy through a personal story); and (4) Apply knowledge to developing an advocacy plan to promote best practices for community engagement in *Deflection* efforts.

Implementation Phase 1 and 2 activities. During the Implementation phases, the CES will receive monthly 30-minute virtual coaching from an expert facilitator in advocacy training. The coaching will include support in serving as a CES including developing and implementing an advocacy plan tailored to prioritize best practices for community engagement as outlined by the DAG (e.g., taking a lead role in educating community on *Deflection* efforts, successes, and milestone progress; expanding stakeholder agency participation in referrals to *Deflection* and services; creating a feedback loop from *Deflection* participants to the DAG). The CES will also be coached on how to actively participate in other community engagement efforts that involve DAG decision making (e.g., city council and school board meetings).

Sustainment activities. During sustainment, CES coaching will cease and DAGs will be encouraged to continue involvement of the CES as a DAG member in decision making and actively promoting community engagement efforts. For example, the CES role could be included in subsequent *Deflection* funding efforts (e.g., BJA COSSUP, state block funds). DAGs will be coached to consider sustainable funding during Implementation Phase 1.

Study Participants

The BRIDGE project includes 4 study populations (1) *Deflection* Workforce staff, (2) *Deflection* Advisory Group, (3) *Deflection* Participants/Clients, and (4) Community Members (Citizens with Lived Experience).

A targeted total of 300 workforce staff involved with *Deflection* will be recruited (15 staff per community x 20 communities); staff participants will include individuals who make referrals to *Deflection* services (e.g., LE, first responders, community agencies) or directly interact with *Deflection* participants (e.g., case manager, peer specialist, coordinator). A sample of 120 DAG members will be recruited; this includes 6 members per community x 20 communities. DAG membership will focus on individuals who make leadership decisions that impact *Deflection* programming or implementation. In addition, 600 *Deflection* participants/clients will include an average of 10 participants per community x 20 communities, and across 3 data collection timepoints. The 600 deflection participants will include those who have been in the *Deflection* program between 3–12 months so that individuals will have had sufficient time in the program in order to respond to questions about deflection participation. Recruitment will include adults (18 years or older) who have used opioids, stimulants, or other substances within the year preceding their deflection enrollment. The 4th targeted group includes 600 community members/citizens, 10 community members x 20 communities, and across 3 data collection timepoints.

Measures

A multi-level mixed methods approach will be used for the BRIDGE Project. Surveys will be administered within the 20 participating communities at 3 cross-sectional timepoints (1. start of Exploration, 2. end of Implementation, and 3. end of Sustainment) across 2.5 years based on study Block (start time and arm) to *Deflection* inter-agency staff, DAG members, *Deflection* Participants/Clients, and Community Members using REDCap and Qualtrics systems. Qualitative data will be collected within the 20 communities at 2 timepoints (start of Exploration, end of Sustainment) from DAG members through focus groups, *Deflection* participants through interviews, and Community Members through a Listening Session. Clients who participant in the survey can opt-in to participate in the interview; a sub sample of community members who complete the survey will also engage in the listening session. Implementation, Public Health, and Public Safety outcomes will be compared across three time periods: start of Exploration, end of Implementation, and end of Sustainment.

Primary and Secondary Implementation Effectiveness Outcomes. Primary implementation outcomes will be examined through measures of (a) *Deflection* interagency staff attitudes about public safety and health interagency collaboration, (b) Community Member attitudes about *Deflection* including awareness, acceptability, appropriateness, and feasibility of local *Deflection* efforts, and (c) use of existing community data to track changes in referral and enrollments to *Deflection* services. Secondary implementation outcomes will include (a) *Deflection* interagency staff attitudes and use of harm reduction approaches and perceived supervisor support, as well as job stress; (b) staff and community members attitudes on LE's role in *Deflection* practices; and (c) staff and community members attitudes toward people who use drugs and policies related to low-level drug offending ; (d) as well as community members trust in law enforcement, sense of community, and collective efficacy, and (e) *Deflection* participants attitudes toward *Deflection* participation including acceptance, appropriateness, and feasibility of *Deflection*, and prior awareness of the *Deflection* program before they enrolled.

Primary Public Health and Public Safety Effectiveness Outcomes. Primary public health outcomes include using existing *Deflection* participant records to examine (a) service referral and receipt along the full SU cascade (screening for SU, treatment referral, treatment initiation, and retention/continued care) and services addressing complex needs (e.g., housing, recovery supports, and employment), and (b) documented illicit opioid, stimulant, or other SU and misuse leading to EMS encounters, overdose, or SU-related mortality; with public safety outcomes including the use of existing *Deflection* records to examine CLS involvement among *Deflection* participants, during and after enrollment in *Deflection*.

Exploratory and contextual mediators. Multi-level mediators will be examined at multiple levels on the relationship between implementation strategies and outcomes including *Deflection* Program (e.g., staff roles including a peer navigator/specialist, active linkage strategies, co-location of *Deflection* office with public safety, and staff skills training); *Deflection* Workforce (e.g., staff turnover); Community [rural/urban, *Deflection* policy mandate, county vs city jurisdiction over *Deflection*, harm reduction and addiction recovery openness (Ashford et al., 2019)], and State [conservative/liberal, Medicaid Expansion].

Analytic Plan and Power

The BRIDGE project has both primary and exploratory questions as listed in Table 1.

Table 1

Primary Research Questions
Q1. Do the combined community engagement strategy bundles (CORE and ENHANCED) improve implementation outcomes (e.g., public health and safety collaboration, community member/citizen awareness and perceived utility of *Deflection*, workforce referrals and community member enrollments in *Deflection*); as compared with pre-implementation period (before CORE and ENHANCED rollout)?
Q2. Does the CORE and/or ENHANCED strategy bundles improve public health (e.g., reducing EMS encounters, overdose, and SU-related mortality, and increasing service access along the full SU cascade) and public safety (e.g., reducing arrests related to SU) outcomes; as compared with pre-implementation period (before CORE and ENHANCED rollout)?
Q3. Does the ENHANCED strategy bundle further improve outcomes for ENHANCED communities; as compared with communities randomized to receive the CORE strategy bundle?
Exploratory Research Questions
Q4. Do CORE and ENHANCED strategy bundles improve collaborating agency workplace attitudes (e.g., law enforcement stress) and reduce stigma (e.g., community stigma toward people with lived experience); as compared with pre-implementation period?
Q5. What organizational (e.g., inter-agency collaboration), community (e.g., rural/urban, *Deflection* referral model), and state (e.g., Medicaid expansion) level factors mediate/moderate the impact of community engagement strategy bundle adoption and sustainment on outcomes?
Q6. What organizational, community, and state level factors mediate the effect of Advocacy (ENHANCED strategy bundle) adoption and sustainment on outcomes?
Q7. How can the CORE and ENHANCED strategy bundles support *Deflection* data harmonization efforts?
Q8. Does an adaptive implementation strategy approach improve community engagement and outcomes for communities that are slow to respond or are non-responsive to adopting strategy bundle practices?

(Table 1 here)

The BRIDGE project uses 2 robust integrated methodologies that include a parallel design and a staggered parallel cluster randomized trial (described in the methods section). A total of 20 participating clinical research performance sites (communities) will first be assigned to one of 2 start time (wave) based on community readiness; and second, communities within each wave will be assigned randomly to receive one of 2 implementation intervention arms (CORE or ENHANCED); resulting in 4 blocks each with 5 communities. Because the participants or observations are nested under communities, we will use a multi-level analysis (Raudenbush et al., 2004) to test the research questions (RQs). To address the question of whether differential change has occurred as a result of the 2 implementation interventions, we will use a random intercepts multi-level repeated measures model as the primary analytical technique, where variations in changes by community and staff are estimated, and with the effects of time (pre-implementation, implementation, sustainment), study arm (CORE vs. ENHANCED), and their interaction being tested as fixed effects. We will first conduct exploratory analyses on all data to examine statistical parameters such as distributions, means and standard deviations, skewness, outliers

and other factors. Data transformations will be made as needed. Little's Test (Little, 1988) will determine if missingness in the dataset can be considered Missing Completely at Random (see Pigott, 2001). Assuming missingness is occurring completely at random or at random, an appropriate imputation strategy will be applied to the data. Baseline variables that are related to missingness at later timepoints will be statistically controlled for in subsequent models. We will describe the 20 communities on pre-implementation period data to assess similarities and differences. Community assignment to one of the 2 starting times will be compared as well as those randomly assigned to the 2 intervention study arms to test for equivalence on pre-implementation measures. Variables on which communities in different random assignment study arms differ, will be used as covariates in subsequent analyses.

Outcome analysis. A multilevel model will assess the primary outcomes of this study (i.e., RQs 1–3), and RQ 4. Observations (or participants) will be nested in communities to create a 2-level multilevel model that will be estimated using full information maximum likelihood (Raudenbush & Bryk, 2002). The Intraclass Correlation Coefficient (ICC; Shrout & Fleiss, 1979) will partition the total variance occurring in the dependent variables into that occurring within and between communities. After estimating the null model, level 1 predictors (i.e., observation- level) and level 2 predictors (i.e., community-level) will be added to the model with fixed parameter estimates. Deviance testing will be used to compare models where Level 1 and Level 2 predictors are estimated with random intercepts and slopes as compared to models with fixed intercepts and slopes (see Snijders & Bosker, 2012). The primary RQs will be tested once parameter estimates have been refined and will include assessing the effects of implementation strategy arm, time, and their interaction on the primary outcome variables. In addition to statistical significance, a global effect size, reported as a pseudo-R2 statistic, will be reported for all models to quantify the practical significance of these findings. For the qualitative data, Rapid Assessment Process (Tsui et al., 2021) as a team-based inductive/deductive method to triangulate and understand findings in an efficient and actionable way will be used in development of community feedback reports; whereas more deliberate thematic analysis using ATLAS.TI will be used to code the data for themes and patterns to be subsequently combined with quantitative data in a mixed methods analysis. RQs 5 and 6 will be investigated as an extension of the previously discussed models. This process will entail exploring Level 1 and 2 predictors that alter the relationship between community adoption and sustainment on the primary outcomes. We will also examine cross-level interactions to determine whether grouping variables, such as organizational, community, or state level characteristics, interact with response level variables (e.g., employment status, attitudes towards *Deflection*) to predict the outcome variables. Significant interactions will be decomposed using simple slope analysis (Aiken & West, 1991) for continuous-by-continuous interactions and regions of significance testing (Johnson & Neyman, 1936) for continuous-by-categorical interactions. To assess community level change in the implementation of a standardized set of outcome measures (RQ 7), we will perform a set of data harmonization checks to assess the change in acceptability, availability, and quality of the data across the 20 communities. This will involve reviewing descriptive statistics, outliers, and missingness; as well as psychometric analyses to evaluate the quality of the measures created during harmonization. Confirmatory factor analysis will determine how well the respondent data measures their targeted latent variables of interest. First-order

and Second-order models will also be fitted to the data when appropriate. Multigroup confirmatory factor analysis will assess the degree to which these measures capture the same latent variables across different demographic backgrounds and communities, while controlling for intervention arm. For RQ 8, we will evaluate whether providing continued coaching as an adaptive approach for non-responsive communities at end of Implementation Phase 1, supported these communities in increasing community engagement by end of Implementation Phase 2 and Sustainment; as compared with responsive communities; as well as outcomes. Comparison of responsive and non-responsive communities on outcomes will use the same multi-level analysis approach as described for RQ 1–4, controlling for community assignment to responsiveness at end of Implementation Phase 1. Predictor variables will be standardized across communities and noteworthy community level factors will be explored as mediators and moderators explaining or modifying any differences in public health and safety outcomes observed between communities.

Power. Two separate power analyses were conducted for the primary aim: the implementation outcomes as measured by workforce staff surveys; and public health and public safety outcomes as measured by existing records. For implementation outcomes, the effect of interest is on within-person change of reported implementation measures before and after implementation from individuals within the 20 participating communities. One thousand simulations were conducted, and power was estimated by the proportion of simulations returning a significant ($p < 0.05$) result for the within-person effect. Data generation and all analyses were conducted using R v. 4.4.1 (R Core Team, 2024). Under these conditions, we estimate 0.847 power to detect a small effect of implementation in the complete data condition and 0.794 power with 25% attrition. Follow-up checks of average variance accounted for by the fixed effects and random effects across simulations confirmed that the simulation replicated the desired conditions. The primary public health outcome is community-level change (e.g., deflection participant counts of EMS encounters as well as opioid- and stimulant-related overdose mortality) and public safety (arrest rates) outcomes; as compared across the three periods (pre-implementation, implementation, and sustainment); and compared between 20 participating communities). Power analyses were conducted using the R package 'mlmpower' (Enders et al., 2023; Keller, 2024). Because the number of communities is fixed, we sought the minimal effect size that could be detected with at least 80% power under conservative conditions. In particular, we assumed the following: the proportion of variance explained by community-specific random intercepts was 36.2%; the variance explained by time alone was 10%; the between-group intervention effect alone was small, explaining 1% of the variance; 46.2% of the variance was residual error. The interaction between time and intervention explained 3.8% of the variance, corresponding to a Cohen's *d* of 0.4 (between a small and medium effect). Under these assumptions, the mlmpower simulation estimated 0.86 power ($\pm$ 0.02) to detect different public health trends across the participating.

Discussion

The BRIDGE project will contribution to the fields of substance use, criminal legal system, and law enforcement alternative strategies such as *Deflection*. This project will (a) significantly enhance

understanding of outcomes among *Deflection* participants including public health (e.g., overdose incidents and substance-use (SU)-related Emergency Medical Service (EMS) contacts and access to SU services) and public safety (e.g., drug-related arrests); and (b) create a lasting contribution to the fields of research focused on SU and the CLS by advancing knowledge of effective implementation strategies involving the critical role of community engagement and advocacy in *Deflection*. The project hopes to close an important research gap (as noted by SAMHSA, 2022) by systematically defining and measuring the effects of community engagement as informed by implementation science (Gunn et al., 2022), ultimately providing a unique approach to assess the relative impact of community engagement strategies (Graffigna and et al., 2020). Lastly, the BRIDGE Project engages consumers (aka community engagement specialists for BRIDGE) as an explicit implementation strategy, which is reportedly rare in implementation research grants (Ducharme et al. 2024).

Abbreviations

BJA
Bureau of Justice Assistance
BRIDGE
Building Resilient Initiatives for Deflection through Greater Engagement
CBH
Community Behavioral Health
CES
Community engagement specialists
CLS
Criminal legal system
DAG
Deflection advisory group
EMS
Emergency medical services
EPIS
Exploration, Preparation, Implementation, and Sustainment
ICC
Intraclass Correlation Coefficient
JCOIN
Justice Community Overdose Innovation Network
LE
Law Enforcement
NIDA
National Institute on Drug Abuse
RQ
Research question

SAMHSA
Substance Abuse and Mental Health Services Administration
SIM
Sequential Intercept Model
SU
Substance use
TCU
Texas Christian University

Declarations

Author Contribution

J.B. and K.K. designed the study, acquired the funding, and wrote the main manuscript text. A.S., C.W., T.S., S.W., and P.C. contributed to the methodology and administration of the study. J.C. and N.P.D. contributed to conceptualization of the study. All authors reviewed the manuscript.

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Figures

Figure 1

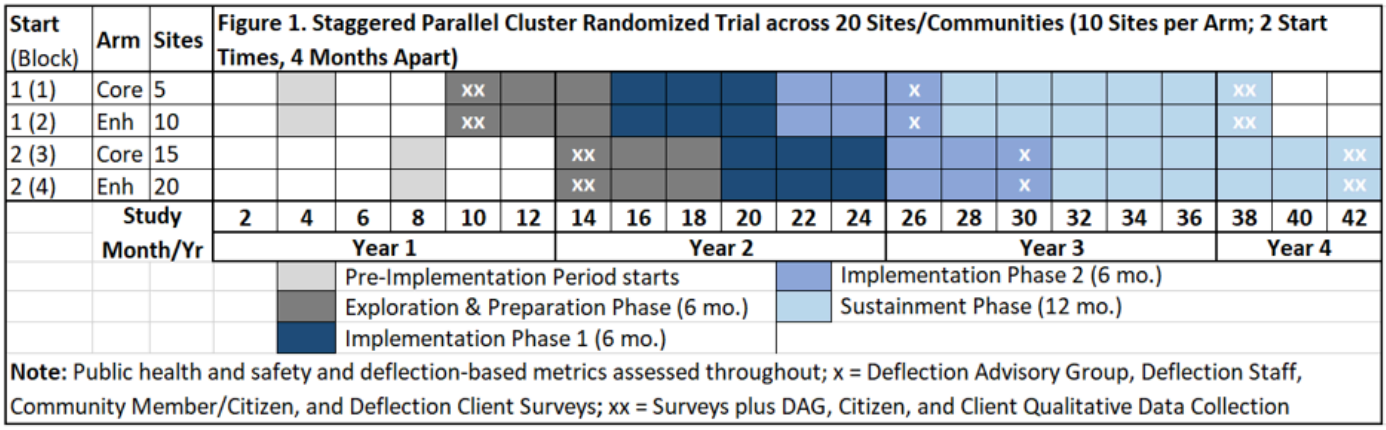


Figure 1

See image above for figure legend.