

CASE STUDY

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Door-to-door overdose harm reduction: an Illinois case study

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Abstract

Background Harm reduction for people who use drugs (PWUD) is an established evidence-based practice that encompasses a wide variety of services, delivery formats, and settings and has been named a priority in US drug policy. Harm reduction is focused on planning *with* communities and meeting PWUD where they *are* and encompasses a wide variety of interventions. We describe and report the feasibility, acceptability, and process implementation outcomes for an innovative pilot drug overdose harm reduction intervention, Block-by-Block (BXB), focused on training for and distribution of naloxone and test strips in areas identified as high risk for fatal overdoses.

Case presentation Beginning operations in 2022, BXB operates in five pilot sites in four Illinois counties. Through partnerships with local organizations, BXB delivers harm reduction services in a private setting (home) or in a setting not specifically focused on serving PWUD (businesses, libraries, faith-based organizations, etc.) to reach PWUD and their friends, family and neighbors living in areas disproportionately affected by opioid overdose death. The intervention theory is based on acknowledgement that harm reduction services that require PWUD to visit a mobile unit, van or community organization, may not reach those in need or their friends, neighbors, and family for a variety of reasons including stigma associated with drug use, lack of awareness about these services, or where to locate them. Services delivered include education and training in the use of naloxone and fentanyl, xylazine and benzodiazepine test strips. Leave behind materials include naloxone, test strips and handouts with information on the intervention and local resources.

Conclusions Results to date indicate that this intervention is feasible –over half (55%) of the doors approached were answered. Acceptability of the intervention as delivered is high –people at 75% of doors that were answered were interested in and received training and/or supplies. BXB is flexible in that it has been quickly adapted to changes in community conditions, the drug supply, and shifting high risk areas as they developed. This is a promising intervention that leverages available data and resources and is readily implementable in communities with support from a central program administrator and access to geo-coded data.

Keywords Harm reduction, Overdose prevention, Community outreach, Intervention models

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Background

Harm reduction for people who use drugs (PWUD) is an established, evidence-based approach to mitigate mortality and morbidity due to drug overdose, HIV, and Hepatitis C associated with injected drug use [1]. The U.S. Substance Abuse and Mental Health Services Administration (SAMHSA) has adopted a harm reduction framework guided by six pillars and 12 principles [2]. Further, harm reduction has been named a federal drug policy priority in efforts to stem the drug overdose crisis [2].

Harm reduction encompasses a wide variety of services, delivery formats, and settings in part, because of its commitment to plan with communities and meet PWUD where they are [3]. As a result, there are many iterations of harm reduction interventions. SAMSHA has grouped harm reduction interventions into six core practice areas: (1) Safer Practices, (2) Safer Settings, (3) Safer Access to Healthcare, (4) Safer Transitions to Care, (5) Sustainable Workforce and (6) Field, and Sustainable Infrastructure [2]. Safer Practices, which includes naloxone training and distribution, and drug checking education and test strip training and distribution is a common focus of harm reduction efforts. Many communities have incorporated Opioid Education and Naloxone Distribution programs into their opioid overdose epidemic response. There is consistent evidence from non-randomized trials that “community-based opioid overdose prevention programs” that include naloxone training and distribution, result in bystanders that can and do administer naloxone effectively [4]. However, a modeling study found an inadequate supply of naloxone in every state but Arizona [5]. Thus, naloxone distribution continues to be a harm reduction priority.

Community naloxone distribution has been found to be cost effective in multiple studies [6]. There is no shortage of strategies for naloxone distribution including combining with Safe Syringe Programs, mobile care vans, take home packages from health care visits, giveaways at awareness raising events, co-prescribing with opioids, and publicly accessible vending machines [7]. Most of these programs through which naloxone is distributed occur in public settings and/or require the person in need to actively seek services which may be a deterrent for some PWUD.

In March 2023, the US Food and Drug Administration approved over the counter (OTC) availability of 4 mg naloxone nasal spray [8]. Naloxone is now available for purchase OTC in Illinois at a price point of about \$44.99 for two doses with a coupon (<https://www.goodrx.com/naloxone>). While OTC availability may expand naloxone accessibility, the price point at which it is offered is likely prohibitive to many PWUD and the need for no-cost naloxone distribution has not abated. Thus, there continues

to be a need for free naloxone distribution in communities with high drug overdose burdens.

Recently, drug checking including test strips and spectroscopy has become an accepted harm reduction practice. There is some evidence that PWUD are concerned about the content of drugs they are consuming, believe that knowledge of the drug supply is helpful for keeping them safe and envision using results to modify drug consumption behaviors [9, 10, 11]. However, more work is needed to assess fentanyl and other test strip efficacy in reducing drug overdose [12].

Our objective is to describe and report feasibility, acceptability, and process implementation outcomes for Block-by-Block (BxB), an innovative pilot drug overdose harm reduction intervention focused on Safer Practices - naloxone training and distribution and drug checking education and test strip training and distribution [9].

The central feature of the intervention is to deliver Safer Practices services in a private setting (home) or in a setting not specifically focused on serving PWUD (businesses, libraries, faith-based organizations, etc.) to reach PWUD and their friends, family and neighbors living in areas disproportionately affected by opioid overdose deaths. The intervention theory behind BxB is based on acknowledgement that harm reduction services that require PWUD to visit a mobile unit, van or community organization, may not reach those in need or their friends, neighbors, and family for a variety of reasons including stigma in publicly identifying as a PWUD, transportation barriers, or lack of awareness about these services or where to locate them [7, 13]. By bringing harm reduction materials directly to individuals these barriers may be reduced.

Case presentation

Planning for BxB, began in 2020. Pilot implementation began in late 2022. BxB is funded by the Illinois Department of Public Health, through its State Overdose to Action State cooperative agreement. The intervention theory is based on acknowledgement that harm reduction services that require PWUD to visit a mobile unit, van or community organization, may not reach those in need or their friends, neighbors, and family for a variety of reasons including stigma in publicly identifying as a PWUD, or lack of awareness about these services or where to locate them [13]. In response, we envisioned a harm reduction intervention that literally meets people where they are – in their homes, businesses and community institutions.

BxB uses data from the Illinois State Unintentional Drug Overdose Reporting System (SUDORS)– also funded by the State Overdose to Action Cooperative agreement. to identify small areas (several contiguous blocks) with concentrations of unintentional

drug overdose deaths in four Illinois counties. SUDORS is a Centers for Disease Control and Prevention led drug overdose surveillance system operating in 49 states. SUDORS includes detailed information on unintentional overdose deaths including injury location.

We began with Lake County because we had identified a funder in the area who provided support prior to the availability of the Illinois Department of Public Health program funding. We added three additional counties (Peoria, St. Clair, and Winnebago) based on overdose death rates and our ability to find a qualified partner in each area.

We initially identified two organizations in Lake County and one organization in each of Peoria, St. Clair, and Winnebago counties. Partners were selected based on (a) reputation in communities with disproportionate drug overdose deaths, (b) experience working with PWUD, (c) interest/experience in harm reduction service delivery, (d) capacity to accept and manage a subcontract from our University and (e) capacity and agreement to hire and train two outreach staff members using the BXB protocol to deliver outreach and collect process evaluation data as outlined by program model. Staffing at the University included a Principal Investigator to oversee the project at 5% time, a half time Program Coordinator, a Communications Coordinator, and an Evaluator at five and ten% time respectively. We also utilized the services of two epidemiologists who work on the Illinois SUDORS to identify and map small areas in pilot counties. The project budget included subcontracts to each community partner, materials printing costs, and test strip purchases. Naloxone was obtained at no cost from state supplies. The program coordinator met multiple times with candidate organizations to describe the intervention, gauge enthusiasm and capacity and gather input regarding the intervention's viability in their community. We also conducted "soft" reputational checks with contacts in the harm reduction community to vet organizations' exposure to and alignment with harm reduction principles. Five organizations were selected based on the coordination team's assessment of likelihood for success.

Partners were chosen for their existing expertise in harm reduction and so were already well versed in naloxone training; however, the Program Coordinator evaluated each groups' processes to ensure they conformed to a uniform standard for the project. The Program Coordinator conducted training on proper preparation and interpretation of immunoassay test strips with each group. In addition, groups were given protocols for door knocking, sample scripts, and approaches, messaging suggestions and tips for the interaction. Finally, the Evaluator trained each group on utilizing the data collection forms for project evaluation.

Our project used multiple levers to ensure a truly equitable partnership between the community organization and the Northwestern team. All community organizations were brought onboard through a contracting process to codify the partnership and ensure protection for the organization's time and expertise by executing a legal document outlining payment terms. We made sure to include partner logos on all leave behind materials. We also created reports for each organization that detailed their efforts and distribution numbers for them to use in grant proposals and other communication opportunities (e.g., with alderman). We held quarterly "All Hands" meetings where all project partners came together (virtually) to share successes, discuss concerns or barriers, and otherwise share information. Finally, the Northwestern team sought feedback on all aspects of the intervention including the proposed methods, focus areas, materials and messaging, and the evaluation activities and interface. Specific examples of feedback given by community partners that was incorporated into the intervention include expanding the door-to-door distribution to include worksite trainings in the focus areas and simplifying and streamlining the evaluation for ease of data entry.

The intervention is simple. Two Outreach Coordinators (qualifications varied by hiring community partner), trained in the intervention procedures and harm reduction, were deployed as a team. Areas were prioritized based on SUDORS data. Our epidemiologist team used mapping software (Maptitude, Caliper Corporation) to demarcate areas for community Outreach Coordinators within which to plan routes and knock on doors in the designated areas. Community partners were expected to approach all addresses in their priority areas (described below) and were given a timeframe in which to complete this task, but the logistics were left to each group. Partner organizations deployed Outreach Coordinators in various ways depending on what worked best for them and their staffing structure. This resulted in some groups sending Outreach Coordinators out for a couple hours multiple times a week and others sending them out for longer shifts less frequently. The only guidance prescribed was that if doors were not answered to return to that address three times in an attempt to reach someone and to vary the day of the week and time of day when the return visit occurred to maximize the chance of reaching someone.

Identified areas include a mixture of single-family residences, apartment buildings and complexes, businesses, and institutions such as churches, libraries, and social service agencies. If doors were opened, Outreach Coordinators would start a conversation with the resident, employee, or staff member regarding (a) the need to help PWUD stay safer, (b) availability of tools to

increase safety including naloxone and test strips, and (c) offer naloxone and/or test strips and associated training on how to use them. Initially we offered injectable and nasal naloxone and fentanyl test strips. Early in 2023, we added Xylazine test strips, and we added benzodiazepine test strips in 2024. Additionally, Outreach Coordinators offered handouts on basic needs services (e.g., food, clothing) and health care, treatment, and recovery support services. Handouts were customized to the local community based on partner organization knowledge and connections. Training and leave-behind materials on naloxone administration and test strip usage were adapted from existing materials produced by the Illinois Department of Public Health and the Chicago Recovery Alliance and vetted for accuracy and language. Our team developed leave-behind materials with BXB branding including door hangers for unanswered doors, leave behind brochures, window decals and yard signs. Materials included logos of all community partners (Fig. 1).

In year two, we began providing some materials in Spanish upon request of Outreach Coordinators.

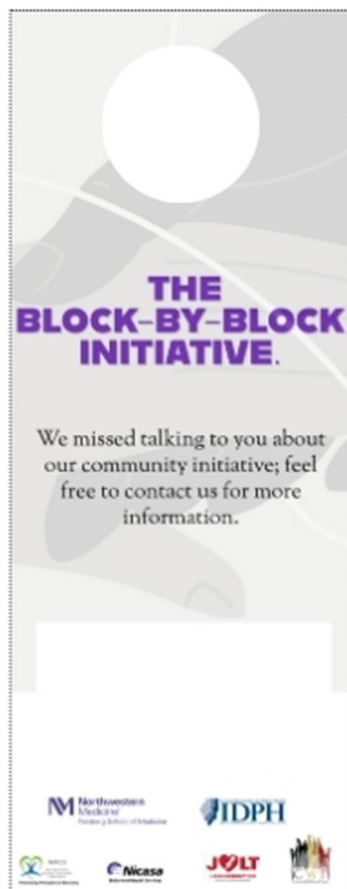
To assess acceptability and feasibility, Outreach Coordinators recorded each door visited and the outcome including if someone answered the door or not, and if they did answer, if they were interested in receiving training and harm reduction materials or not (see Fig. 1). We also interviewed Outreach Coordinators regarding their experiences, successes and challenges. Project personnel (community partners, university team) meet quarterly to review progress, share best practices and trouble shoot implementation barriers.

Program evolution

Program adjustments have been made over the course of the early implementation phase as we continually evaluated the intervention's implementation. Feedback from Outreach Coordinators drove project-wide modification to adapt the intervention to best fit community and community partner needs. Modifications were made to address barriers and to implement successful strategies project-wide. Key program changes are detailed below.

Improving our "pitch." Within the last year, we adjusted our coaching of Outreach Coordinators based on

Door Hanger w/ Card Insert



Window Decal (Static Cling)



Plastic Yard Sign with Wire Frame - 18" x 24"



Fig. 1 Block by block promotional materials

feedback from Outreach and Project Coordinators. Based on reports from Outreach Coordinators that it was successful, we now include a script emphasizing that naloxone should be part of every home's first aid kit. This messaging serves two purposes, the first destigmatizing the need for harm reduction materials by normalizing them, and the second, to position naloxone as something that is relevant and appropriate for all to have regardless of their self-identified need or lack thereof. This normalization seemed to put residents at ease that they weren't being singled out; rather, everyone should have them. This has proven successful in engaging residents and encouraging acceptance of harm reduction materials and instruction.

Setting engagement guidelines. We established a guideline that prohibits talking to people under 18 years of age. While we are aware that youth are often in a position to intervene, and could play an important role in harm reduction for themselves and others, we didn't feel this intervention was the appropriate mechanism for reaching youth based on the nature of the distribution where caregivers may be uncomfortable given the vulnerable position the children would be in (i.e., opening the door to a stranger and having a conversation). We felt we would have greater community buy-in if we politely declined and returned later to speak to an adult.

Overcoming access issues. In some cases, access to apartment buildings has been difficult. We have attempted to overcome this by seeking permission in advance from apartment or property managers to gain access to these buildings. Another issue that arose is the need to work with employees or staff members in non-residential buildings to gain their management's approval.

Adjusting materials distributed to reflect partner preferences and changes in the drug supply. Initially, most of our partners were able to obtain and distribute intramuscular naloxone. However, one site felt that they would have more success with nasal naloxone and switched to that during early implementation.

We have evolved our harm reduction materials as best practices have evolved. For example, we added Xylazine test strips in 2023 as Xylazine began to appear in the drug supply in Illinois. In 2024, we added benzodiazepine test strips as that class of substances has become more prevalent in the drug supply. We are currently investigating the cost of including premeasured water containers for use with the test strips to improve their practicality of use in community settings.

Staffing and partner turnover. During the early implementation we experienced Outreach Coordinator turnover. We are currently exploring reasons for turnover and looking for solutions to retain effective Outreach Coordinators. There has been turnover among our community

partners as well. A partner left in March 2024 due to personal reasons that prohibited them from continuing the work. In June 2024 another partner decided to end their involvement by the end of August due to organizational capacity issues. In one case, we reallocated the leaving partner's territory to an existing partner. In the other case, we are negotiating a new site in a previously unserved county.

Methods for presenting small areas for intervention delivery. Perhaps the aspect of the intervention with which we experimented the most is how to present the small areas identified by the intervention to community partners and Community Outreach Coordinators. Initially, we used hotspot mapping to identify small areas with disproportionate risk. However, community partners did not find that provided enough direction for them to implement confidently. Next, we tried to map routes, but community partners found that too restrictive. Following that, we tried mapping prioritized census tracts. Community partners felt that this did not provide enough detail for small areas. Finally, after a review of data protections practices, we settled on pin-point maps, that indicated the location of fatal overdoses and the year in which they occurred. Our community partners have indicated that they prefer this presentation. Maps are updated every six months as new SUDORS data become available. We are currently mapping data for deaths occurring between January and December 2023. See Figs. 2 and 3 for sample pinpoint maps (note these are not actual data, we randomly assigned pinpoints in these examples for privacy protection).

Results

Distribution In its first 18 months of operations, BXB made door to door visits in 44 unique Illinois zip codes or about 3% of all Illinois zip codes. More than half of the visited zip codes had a 2022 poverty rate higher than the state's poverty rate of 9.3. Nearly half (45.7%) of zip codes had a 2022 unemployment rate higher than that for the state of Illinois (5.3%). Almost half (47.8%) of zip codes visited had a Black population greater than the state's proportion of Black residents (13.7%) and a White population less than the state's proportion of White residents (59.6%). In short, BXB was active in communities that experienced socio-economic disadvantages with higher proportions of residents who were Black, living in poverty and unemployed compared to the state averages.

From December 1, 2022, to June 30, 2024, 1640 doors were approached. Of the doors approached, 55% (901) were answered, and of those, 75% (672) were interested in materials and training (Table 1). Private residences, both single family and multi-unit housing, were much less likely to answer the door than public or commercial buildings (45%, 51%, 95% and 89%, respectively). Public

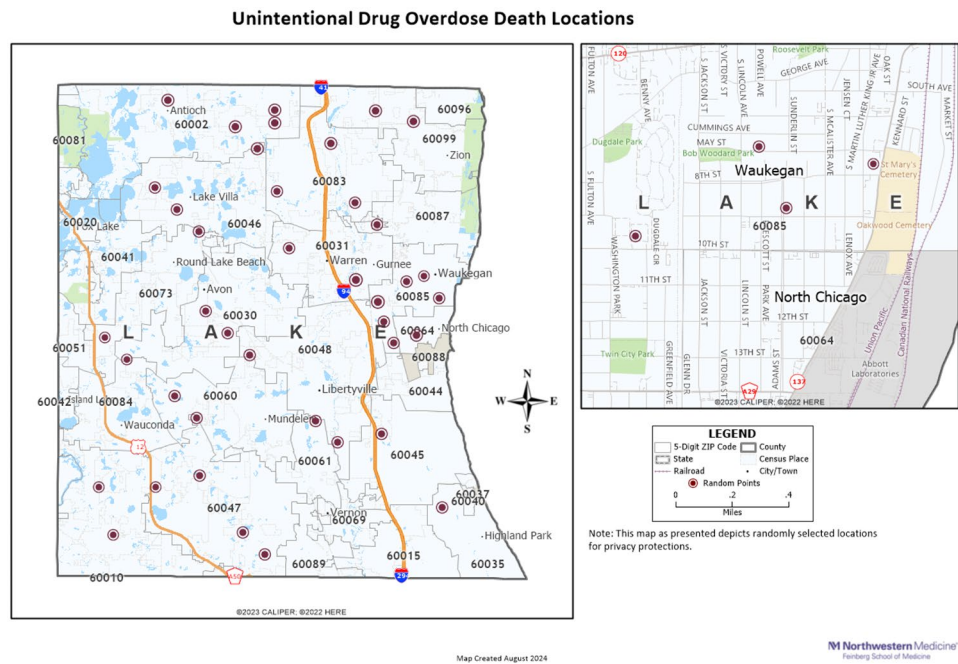


Fig. 2 County and zoomed in view of small area mapping

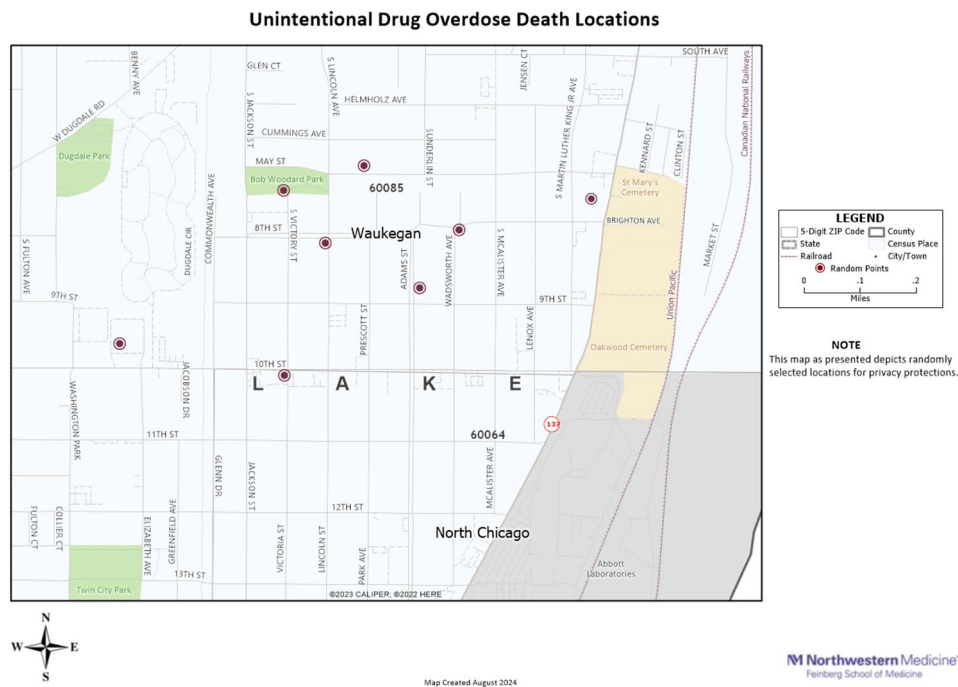


Fig. 3 Small area mapping

and commercial buildings were also more likely to be interested in training and materials, though over half of all doors answered were interested in materials and training regardless of building type.

The Community Outreach team distributed over 2000 boxes of nasal naloxone, 100 boxes of intramuscular naloxone, 1000 fentanyl test strips, and 200 xylazine

test strips into identified areas with high overdose risk (Table 2). Materials advertising naloxone availability and resource flyers were also distributed.

Facilitators and Barriers In addition to quarterly all-team meetings where discussion focused on progress, and ideas for improving the project, the evaluator conducted group interviews with team members at each

Table 1 Addresses approached and response rates

Type	Doors Approached	Able to talk to someone			Interested in receiving training and materials			
	Count	Yes	No	Response Rate %	Yes	No	Other*	% interested
Single family residence	919	412	507	45%	300	111	1	73%
Multi-unit residence	433	219	214	51%	137	75	7	63%
Business/ commercial	238	226	12	95%	198	17	11	88%
Public building/ Not for profit (church, library, social service, school, etc.)	44	39	5	89%	32	3	4	82%
Other	6	5	1	83%	5	0	0	100%
Overall	1640	901	739	55%	672	206	22	75%

* Not sure/Needed to talk to someone else/Language barrier

Table 2 Trainings given and materials distributed

	Total
Trainings given	285
How many people were trained?	987
# of flyers given	1269
# of kits of IM Naloxone given	116
# of boxes of nasal Naloxone given	2113
# of fentanyl test strips given	1044
# of Xylazine test strips given	226
# of benzodiazepine test strips given	16
# of referral sheets given	373
# of yard signs given	34
# of window stickers given	80

partner organization (we had 3 partners at the time of interviews) to understand the feasibility, challenges, and impact of the project from the community Outreach Coordinator perspective.

Partner organizations spoke overwhelmingly positively about the BXB pilot as a way to get harm reduction materials into the community. Specifically, one organization spoke about the benefit of having hyper-local community organizations engaged in this work which facilitated distribution because of existing trust from the community.

[The] community has a lot of trust in us because we have been here for 3 years engaging with people. We are out in the community working with people and so we are trusted because of our relationships. We have been doing harm reduction - they know they can talk to us. (Community Outreach Coordinator, East St. Louis, IL)

Organizations also spoke about the benefit of the BXB model for reaching populations that they wouldn't otherwise reach:

The biggest obstacle was reaching Black population on the south end of Peoria – they were hesitant, not taking [Narcan], not calling 911, but now that they have seen us down there, they trust us. They have seen the overdoses, and the area is neglected, and people are very disenfranchised and so building those relationships has helped a lot. We brought food down and fed them, and brought Narcan, and we went back to the same places at parks or parking lots where people hung out and they got to know us. Transportation is barrier for this area. So, they have a hard time getting to us. We leave our info so they can call us for more Narcan. (Community Outreach Coordinator, Peoria, IL)

These are people we don't usually see. Especially people who have recently experienced an overdose – they aren't usually in the community engaging. (Community Outreach Coordinator, Waukegan, IL)

All partner organizations reported BXB having an impact on residents in their communities:

Wasn't on our minds to approach people about overdose before and now it breaks down stigma and we can talk about it. We have given people knowledge they didn't have before, and I know it has saved lives. (Community Outreach Coordinator, East St. Louis, IL)

It's going well – overdoses have been reversing – there aren't that many people dying. Participants...they don't usually call 911...they do the reversal themselves.... I was listening to the scanner and there was a reversal that a citizen had just done that we gave earlier that day. (Community Outreach Coordinator, Peoria, IL)

Fire department has seen a drop in overdose deaths

since beginning Block-by-Block (Community Outreach Coordinator, Waukegan, IL).

One organization spoke of the potential for the BXB model to lead to longer term impact, beyond the immediate harm reduction of overdose reversals:

I think having these relationships around harm reduction allows for small moments for support and potentially breaking through to get people into treatment. Starting with moving mindset. That is what makes this grant so different from the other grants we have. (Community Outreach Coordinator, East St. Louis, IL)

Partner acceptance of and dedicated participation in the effort helped to facilitate the success of the intervention. The most important contribution was their expertise in harm reduction and their knowledge of local communities. Trust their communities had in them from years of service helped as well. Outreach Coordinator knowledge of their communities allowed nimble modification to messaging to fit their audience by framing harm reduction as first aid.

The effort was not without challenges, however. Challenges included lack of awareness by the community, language barriers and the need for materials in multiple languages (Spanish, Russian, Ukrainian, Polish), safety concerns (in high-crime areas and from dogs), and residential addresses not being home or not answering their doors.

Recommendations for improving the pilot included increasing cultural competence of the project team, employing diverse outreach strategies, having materials in multiple languages, working with apartment building managers on alternative outreach methods (e.g., events in a common area), and promoting the program in local newsletters and media.

Increasing cultural competence is a must... One member of the 'boots on the ground' team needs to have experience with the community – where at least one person on the team can relate on a cultural level. Perhaps on a substance use level as well. (Community Outreach Coordinator, East St. Louis, IL)

Tell them about the risk of opioids – how Narcan helps – and also the other stuff that is in there [e.g., Fentanyl] and so then maybe they might not use alone -at least if they knew then they could understand the risk more and make a decision about being safer. (Community Outreach Coordinator, Peoria, IL)

Discussion and conclusions

Our results to date indicate that this intervention is feasible –that we can reach our target population with this outreach model. The engagement rate indicates that this intervention is acceptable in our target communities – that community members are accepting harm reduction education, training and materials for overdose prevention. The program's evolution indicates it can be adapted to changing community conditions, drug supply, and new information as it is developed. This is a promising intervention that leverages existing resources and is readily implementable in communities with an existing, trusted organization working in this area and access to geo-coded data.

While our results regarding feasibility and acceptability are positive, there is a need for expanded evaluation relative to the populations being reached (minoritized communities, PWUD vs. families/friends, older vs. younger PWUD), whether the harm reduction materials are used, changes in knowledge of harm reduction services in the community, and ultimately, whether this harm reduction intervention contributed to a reduction in overdoses.

Abbreviations

PWUD	People who use drugs
SUDORS	State Unintentional Drug Overdose Reporting System
BXB	Block-by Block

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Author contributions

Dr. Maryann Mason – Conceptualized the project and served as lead author including completing the first drafts and revisions of the manuscript. Sean Johnston –Contributed expertise in harm reduction strategies and reported project coordination activities. Ursula Alexander, MPH, contributed to the mapping of data for local community area identification and contributed to manuscripts drafts. Oyindamola Ajala, MPH, contributed to the mapping of data for local community area identification and contributed to manuscripts drafts. Nia Andrews, MJur developed the communication materials and edited versions of the manuscript drafts. Sarah B. Welch, MPH, led the evaluation of the intervention and edited versions of the manuscript drafts. Bruce Johnson -community partner, led a pilot site and contributed insights for the evaluation, contributed to manuscript drafts. Chris Schaffner -community partner, led a pilot site and contributed insights for the evaluation, contributed to manuscript drafts.

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Data availability

Evaluation data is available upon request.

Declarations

Ethics approval and consent to participate

This study was determined reviewed by the Northwestern University Institutional Review Board (STU00218306) and found not to be human research. No consent for participation was obtained.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

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