







Mapping Needles, Reducing Harm

Community Report

Acknowledgments

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Designed by Chantal Abdel-Nour.

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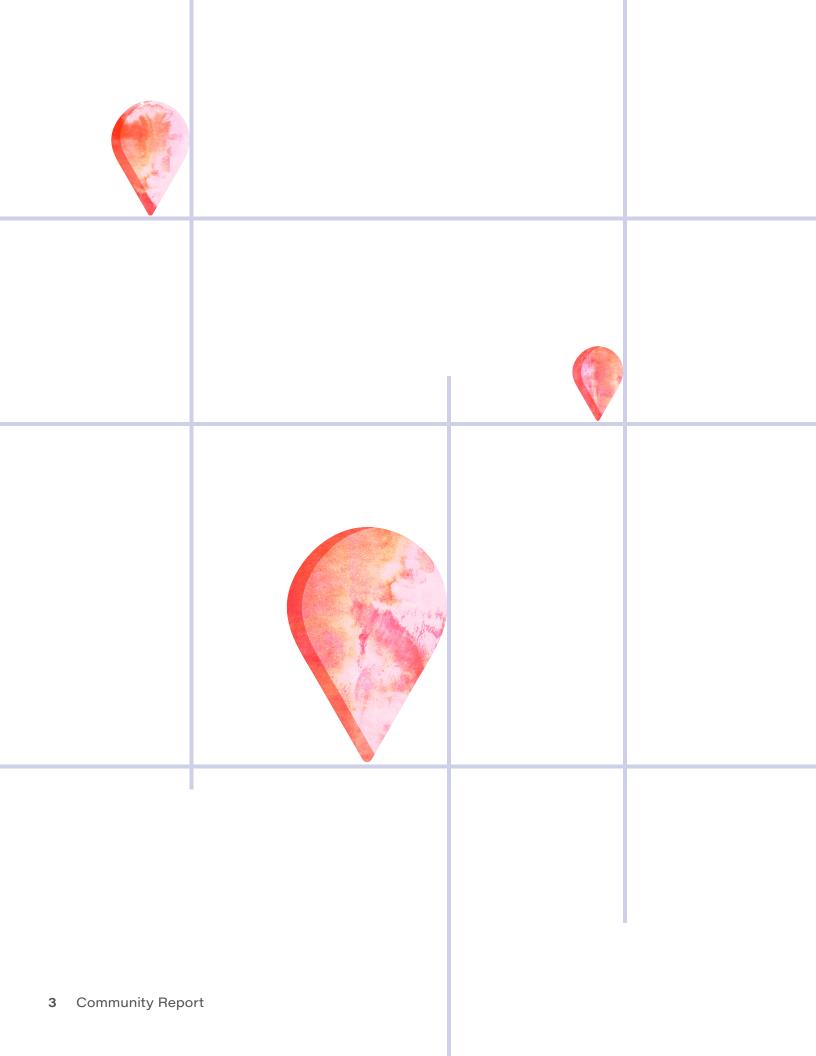






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Executive Summary

Mapping Needles, Reducing Harm is the first research project arising from a community-academic partnership between AIDS Programs South Saskatchewan, Inc. (APSS) and the Eaton Lab, based at the Jane Addams College of Social Work, University of Illinois Chicago.

This project utilized a real-time geographic information system (GIS) to map the community needles data collected through www.ReportNeedles.ca. As a community-academic partnership between people who use drugs, service providers, and interdisciplinary researchers, this project is informed by principles of harm reduction and implementation science. We generated geo maps of Regina hotspots where community needle prevalence in public spaces is the highest and deployed and evaluated harm reduction interventions of Naloxone training and support groups. Between August 2023 and August 2024, 315 reports on www.ReportNeedles.ca led to the safe disposal of 2,836 needles. Naloxone trainings were found to provide accurate, accessible information on reversing opioid overdoses. Arts-based, low-barrier support groups for people who use drugs, where sobriety was neither mandated nor encouraged, were well-liked by participants who found the space safe to discuss substance use and harm reduction. Overall, this rapid assessment and response system of collecting and mapping needles followed by harm reduction intervention delivery was found to be feasible and accessible for people who use drugs in Regina.



What is www.ReportNeedles.ca?



The tool **ReportNeedles.ca** is a web-based app developed by APSS for the public and first responders to anonymously enter community needle presence. ReportNeedles.ca was coded by a web developer, in consultation with APSS, as part of an event, or hackathon, where people gather to participate in rapid and collaborative technology development for social innovation. The application provides geographic data that offer valuable insights into the distribution of needles, an indicative marker of areas where individuals requiring substance use services are more likely to be concentrated.

APSS identified the need for the app due to the extremely high presence of discarded needles in public places, that were beyond the capacity of the fire department to promptly collect. ReportNeedles.ca was coded for scale, as the website's code has capacity for geo-spatial reporting in many areas (connected via Google Maps) with the potential for discrete needle reports to be directed to distinct organizations based on location, and keeping the reports private to an organization within that local area.¹

Study Design

Aligned with implementation science principles of identifying and intervening, this project's rapid assessment and response system involved real-time GIS mapping of community needle prevalence data alongside with deployment and evaluation of targeted harm reduction interventions of Naloxone training and support groups.



Figure 1. Study Design Overview

Substance use is an endemic health challenge in Saskatchewan (SK), Canada. 2023 was the 7th consecutive year that SK reported steady increases in overdose deaths, reaching a crisis state.² Rising drug-related deaths and harms in SK-which contribute to the province's HIV transmission rate being more than double the national average-have been attributed to three key factors: a) lack of refined data collection; b) lack of knowledge; and c) lack of support for people who use drugs.^{3,4} Our project addressed these challenges through the real-time GIS mapping of community needle prevalence, Naloxone training, and support groups. The project was approved by the University of Regina's Research Ethics Board (#236).

ECONOMIC 5.4/10 (mid-range)*	Minimum Wage	2020-2021 change in GDP	Inflation Rate	Social Assistance	Median After-Tax Income	Percentage of severely food insecure households	Labour Force Participation Rate	Employment Rate
HEALTH 2/10 (second-last)*	Number of physicians per 100 000	HIV Diagnoses per 100 000	Rates of Premature Deaths	Surgical Wait Times	Opioid Toxicity Deaths per 100 000	Self-Rated Heath	Hospital Beds per 1000	
EDUCATION 2/10 (second-last)*	Public School Spending	Per-Student Spending	Proportion of Children Living in Childcare Deserts	Mean Academic Performance	Teacher Workload and Burnout	On-Time Graduation Rates		
PUBLIC SAFETY 1/10 (last place)*	Crime Severity Index	Number of Homicides per 100 000	Number of Incarcerations per 100 000	Number of Intimate Partner Violence Victims per 100 000	Ranke Bottor Mid-R	n Quartile	*= average among provinc	Canadian
	E' 0.T				Top Q	0	provinc	es

Figure 2. The Dire Quality of Life in Saskatchewan⁵

Mapping Needles

APSS launched **www.ReportNeedles.ca** in April 2021 and as of August 2024, over 35,000 needles have been collected from over 600 reports on the app.





Figure 3. APSS Staff on a Needle Pick-Up

During this project, needles were primarily reported and collected in neighbourhoods near the city centre of Regina. However, needles were also reported in the surrounding suburbs. There is seasonal variation as during the summer months, there was greater geographical dispersion of needles and more reports in suburban areas than in winter where needle reports were more concentrated in the city centre.⁶

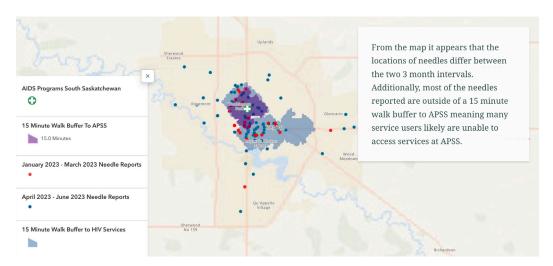


Figure 4. Relationships Between Needle Pick-Ups and Services

APSS is accessible by a 15-minute walk to three Regina neighbourhoods and is inaccessible to many areas where needle have been reported. By expanding and offering pop-up sites for Naloxone trainings, APSS was able to expand the accessibility of their services to cover more neighbourhoods and areas.⁶

Naloxone Trainings

A total of 7 pop-up trainings occurred between August 2023 and August 2024. Pop-up trainings were focused on areas with high needle prevalence. A total of 44 participants were trained in overdose recognition and naloxone administration between August 2023 and August 2024. Participants were predominantly cisgender women (59.1%; n = 26) or cisgender men (29.5%; n = 13). The majority of participants were Indigenous (63.7%; n = 28) or White (34.1%; n = 15). The participants who attended the training had a mean age of 41.6 (SD=14.6; Range: 17–73).

Results from the Opioid Overdose Knowledge Scale (OOKS)7 showed that participants were knowledgeable on opioid overdose and naloxone administration (See Table 1 on pages 9 and 10). The majority of participants (70.2%) correctly determined the risk factors of an opioid overdose. Training participants were largely successful at indicating signs of an opioid overdose (75.6%) but struggled to discern at least one incorrect symptom (39.3%). Regarding naloxone administration, the majority of participants were able to recognize the appropriate actions to take (83.7%) and inappropriate actions to avoid (93.8%) when managing an opioid overdose. While majority of the sample indicated the correct use of naloxone for opioid overdose (90.9%), a greater proportion erroneously suggested that naloxone could also reverse the effects of a stimulant (95.5%) and Benzodiazepines (93.2%). Over 93% of subjects successfully identified the administration route of naloxone and over 90% understood that naloxone injection should be delivered through thighs or upper arms. The majority of the sample accurately determined the length of onset (81.8%) and duration of naloxone (61.4%).6

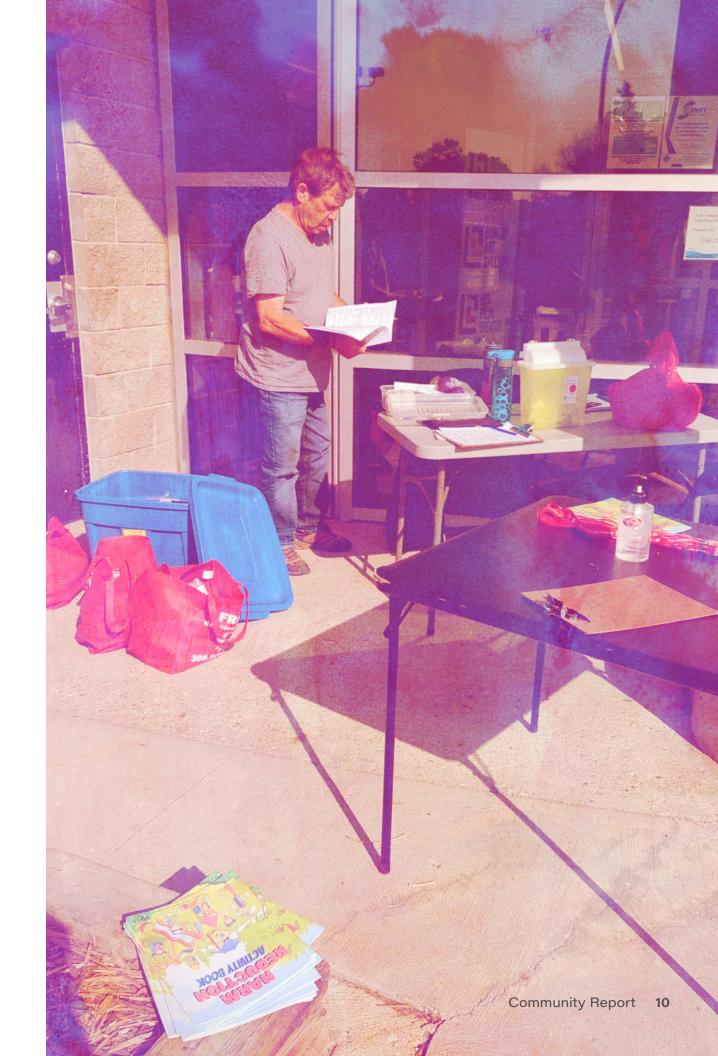


Table 1. Opioid Overdose Knowledge Scale Items (n=44)

RISK FACTORS OF OPIOID OVERDOSE RISK		
Which of the following factors increase the risk of a fentanyl (opioid) overdose?		
Taking larger than usual doses of fentanyl	36	81.8%
Switching from smoking to injecting fentanyl	28	63.6%
Using heroin with other substances, such as alcohol	32	72.7%
or sleeping pills		
Increase in fentanyl purity	27	61.4%
Using fentanyl again after not having used for a while	35	79.5%
Using fentanyl when no one else is present around	31	70.5%
A long history of fentanyl use	30	68.2%
Using heroin again soon after release from prison or from a detox treatment	28	63.6%
SIGNS OF OVERDOSE		
Having blood-shot eyes (F)	9	20.5%
Slow/shallow breathing	39	88.6%
Lips, hands, or feet turning blue	39	88.6%
Loss of consciousness	39	88.6%
Unresponsive	39	88.6%
Seizures or convulsions	16	36.3%
Deep snoring	27	61.4%
Very small pupils	34	77.3%
Agitated behaviour (F)	16	36.4%
Rapid heartbeat (F)	18	60.9%
NALOXONE KNOWLEDGE AND ADMINISTRATION		
Which of the following should be done when managing an opioid overdose?		
Call an ambulance	43	97.7%
Stay with the person until an ambulance arrives	39	88.6%
Inject the person with salt solution or milk (F)	2	4.5%
Mouth to mouth resuscitation	28	63.6%
Give stimulants (e.g. cocaine or black coffee) (F)	4	9.1%
Place the person in the recovery position (on their side with mouth clear)	35	79.5%
Give Naloxone (opioid antidote)	41	93.2%
Put the person in a bath of cold water (F)	4	9.1%
Check for breathing	37	84.1%
Check for blocked airways (nose and mouth)	35	79.5%
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Table 1 con't.

To reverse the effects of a fentanyl overdose (e.g. heroin, methadone)	40	90.9%
To reverse the effects of a stimulant (e.g. crystal meth, cocaine) overdose (F)	42	95.5%
To reverse the effects of Benzodiazepines (e.g. Xanax, Ativan) (F)	41	93.2%
How can naloxone be administered?		
Into a muscle (intramuscular)	41	93.2%
Into a vein (intravenous)	2	4.5%
Under the skin (subcutaneous)	4	9.1%
Swallowing liquid/tablet (F)	1	2.3%
Where is the most recommended place for non-expert to administer naloxone?		
Outside of thighs or upper arms	40	90.9%
Any vein (F)	1	2.3%
Heart (F)	0	0%
By mouth (F)	1	2.3%
How long does naloxone take to start having an effect?		
2-5 minutes	36	81.8%
6-10 minutes (F)	4	9.1%
11-20 minutes (F)	1	2.3%
21-40 minutes (F)	0	0%
How long does naloxone last for?		
Less than 20 minutes (F)	5	11.4%
About 1 hour	27	61.4%
1 to 6 hours (F)	3	6.8%
6 to 12 hours (F)	0	0%
TICK EACH CORRECT STATEMENT		
TICK LACTI CONNECT STATEMENT	38	86.4%
	+	86.4%
If the first dose of naloxone has no effect, a second dose can be given (T) There is no need to call for an ambulance if I know how to manage an	38	00.470
If the first dose of naloxone has no effect, a second dose can be given (T) There is no need to call for an ambulance if I know how to manage an overdose (F)	38	84.1%
If the first dose of naloxone has no effect, a second dose can be given (T) There is no need to call for an ambulance if I know how to manage an overdose (F)		
If the first dose of naloxone has no effect, a second dose can be given (T) There is no need to call for an ambulance if I know how to manage an overdose (F) Someone can overdose again even after having received naloxone (T)	37	84.1%

Figure 5. Participant Artwork

Support Groups

Support groups are commonly accessed for substance use issues, but primarily discourage or disallow active substance use during the group process. Employing community-based participatory research, we offered a low-barrier support group for people who use drugs, where sobriety was neither mandated nor encouraged, from a liberatory harm reduction and dislocation theory perspective. Facilitator session reports and participant artwork were analyzed to derive three themes and six sub-themes. Storytelling as a Site of Healing and Resistance explores subthemes of voicing lived experience and bearing witness to one's story. Peer-Led Learning explores the subthemes of collective knowledge sharing and the consciousness-raising process. Environmental and Bodily Safety explores subthemes of flexible engagement and art as a tool for grounding. By examining the dynamics of a low-barrier, harm reduction support group for people who use drugs, this study offers a rare empirical contribution to an area that remains otherwise underexplored.8





Discussion

The www.ReportNeedles.ca app shows promise as a tool to address issues of community needle prevalence and access to care. The tool has the ability to foster community-academic partnerships to address issues related to substance use harm reduction. GIS mapping in the health science literature has been utilized to map the distribution of resources and identify regional health inequities. Holie prior studies have been largely retrospective and have not integrated GIS into health programming, the findings of this study demonstrate that real-time geospatial data on community needle prevalence can successfully facilitate targeted harm reduction interventions in areas of highest need. Geospatial analysis enables the creation of tailored community-based interventions for underserved populations, specifically people who use drugs, who may not access conventional healthcare services for a variety of reasons. People who use drugs who are transient have barriers to accessing healthcare. Geospatial analysis of needle prevalence data enables adaptation of services to migratory patterns of transient populations.

The study results suggest that pop-up brief opioid education and naloxone training interventions as well as support groups are feasible and acceptable to people who use drugs. Following the training participants demonstrated strong knowledge of opioid overdose and awareness of appropriate procedures to follow in the event of an overdose. Recent studies corroborate findings that naloxone trainings significantly improve subjects' awareness, knowledge, and confidence regarding overdose management.¹³⁻¹⁵ Prior research suggest that participants show consistent retention of overdose management knowledge of up to 6 months after interventions.16

Multiple naloxone training sessions occurred on or within walking distance of Treaty 4 territory in Regina, SK, resulting in a majority Indigenous sample. Prior research has shown that Indigenous Canadians are more likely to have opioid use disorders and are at higher risk of drug-toxicity deaths, but reportedly view harm reduction programming as culturally incompatible.^{17,18} In the literature, few studies appear to specifically focus on naloxone training initiatives directed at Indigenous populations. Levine et al. describes how

Indigenous-led "Not-Just-Naloxone" workshops in British Columbia provided culturally relevant harm reduction education and training, increasing knowledge, awareness, and self-efficacy among First Nations participants. ¹⁹ Greater involvement of Indigenous people, specifically those with lived and living experience of drug use, within research is essential in developing culturally tailored initiatives and increasing engagement in health services.

The support group's attention to environmental and bodily safety reflected core principles of liberatory harm reduction, which emphasizes the importance of creating spaces that attend to the immediate realities and needs of people who use drugs.²⁰ Support group participants often created art while listening, talking, or simply existing in the space. In these moments, the group facilitated what dislocation theory identifies as small but meaningful acts of reintegration: reestablishing a sense of connection to self, to others, and to the environment in ways that resisted shame, control, or isolation.²¹



Limitations

This project contains several limitations. Firstly, no pre-test and follow-up assessments were conducted, meaning that changes in or retention of knowledge regarding overdose and naloxone administration or changes in substance use from the support group cannot be determined. Another limitation of this study is related to sampling. The training sessions and support groups likely attracted a self-selected group of individuals who were willing and able to participate. This bias potentially results in a group different than the broader population of people who use substances. For example, those with less familiarity with harm reduction services like APSS may be underrepresented.

Additionally, despite the wide distribution of discarded needles in Regina suburbs, pop-up interventions were limited to areas of highest need, due to limited resources. Furthermore, the research team did not inquire participants on their history of drug use. In the support group specifically, data were derived primarily from the perspective of group facilitators. While the facilitators were peers with their own lived experience of substance use, this experience should not be conflated with participants' experience. There is a risk of bias due to reliance on facilitators' observational notes. Facilitators frequently noted verbatim statements from participants to better highlight participant voices.

Lastly, ReportNeedles.ca is a tool that depends on user reports of discarded needles in the community. Consequently, ReportNeedles.ca may be impacted by reporting bias and underreporting, since users may be unequally distributed within Regina, leading to certain regions having more comprehensive and up-to-date data than other areas.

Conclusion

This report presents promising results from a geospatial, community-based needle collection and naloxone training and support groups initiative. In one non-walkable, medium-sized Canadian city, injection drug use is dispersed throughout the city and outside walking distance to healthcare and harm reduction services. Developing strategies for culturally tailored, geo-located street-outreach and social support may reduce drug-related crises.



3 INFECTIONS, 1 FIGHT:

Interested in learning more about the ongoing research projects between APSS and the Eaton Lab? Our next study is called 3 *Infections, 1 Fight: A Community Response* and uses **www.ReportNeedles.ca** to identify areas for pop-up testing of HIV, syphilis, and hepatitis C alongside education on safer drug use and safer sex.²²

We have also developed a map of safe spaces in Regina for people who use drugs to access service and a pamphlet on safer meth smoking. For those resources and study updates, please visit: **www.eaton-lab.com/reportneedlesca**.

Pop-Up Site Services



Prevention Information

Free information on PrEP and PEP to prevent HIV.



Testing Services

Quick testing for HIV, syphillis, and hepatitis C.



Free Medicine Bundle

Such as condoms.



Peer Support

Team includes peers with relevant lived experience.



Connecting to Care

Assistance connecting to care if any test is positive.

Improving Health with Pop-Up Tents

Publicly Discarded Needles
Health risks and needle waste

Implement Pop-Up Tents

Safer Community Health

Reduced risks and ongoing support

Track used needle locations

2 Offer testing and support services

3 Demonstrate pop-up tent effectiveness

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Agency Information



AIDS Programs South Saskatchewan, Inc. (APSS)

Since 1985, APSS has been helping people living with and affected by HIV/AIDS. We are a community-based non-profit registered charitable organization. Our goal is to provide people living with HIV/AIDS, Hepatitis C (HCV), and other Sexually Transmitted and Blood Borne Infections (STBBIs) and those at risk of contracting the viruses with relevant and current information and support services. APSS serves the larger community of Regina and Southern Saskatchewan in all HIV-related matters. APSS is a registered non-profit charity and is funded in part by the Saskatchewan Health Authority, Saskatchewan Health and the Government of Canada, as well as corporate sponsorships and donations. https://www.aidsprogramssouthsask.com



Eaton Lab

The Eaton Lab is a community-based, interdisciplinary health & social science lab to address aging, sexuality, mental health, and substance use. The lab is led by Dr. Andrew D. Eaton, an Associate Professor at the Jane Addams College of Social Work, University of Illinois Chicago with status-only appointments at the Factor-Inwentash Faculty of Social Work, University of Toronto and the Faculty of Social Work, University of Regina. This lab is dedicated to community-based scholarship with real life impact, with a substantial focus on training the next generation of social work practitioners and researchers. https://eaton-lab.com

