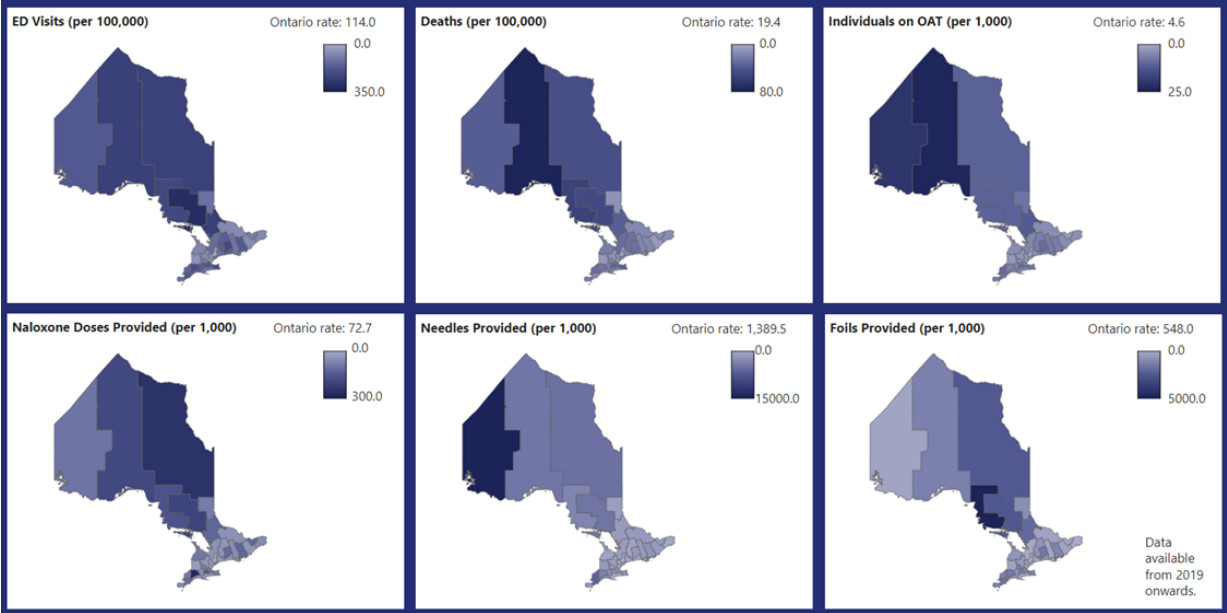


UNDERSTANDING REGIONAL CHANGES IN HARM REDUCTION SERVICES IN ONTARIO OVER THE COVID-19 PANDEMIC

*Findings from a Public Health Ontario Locally Driven Collaborative Project
November 2022 – March 2023*



Report prepared by the following organizations on behalf of the LDCP group:



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Project Overview

The following report describes findings from a Public Health Ontario funded Locally Driven Collaborative Project that described regional changes to harm reduction service delivery and opioid-related morbidity and mortality in Ontario over the course of the COVID-19 pandemic. Virtual snapshots displaying trends over time were developed by the project team to describe changes that have occurred within each of the 34 health unit regions in the province over the last several years, and includes comparisons to Ontario-level data. These snapshots were created for use by public health units, organizations specializing in harm reduction, and other interested individuals, organizations and networks to enhance situational awareness and support program planning and advocacy efforts to address the opioid toxicity crisis.

View the snapshots [HERE](#).

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Funded By

Public Health Ontario funded this LDCP. Funding was awarded to the project team to complete the project between November, 2022 and March 31, 2023.

Project Team

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Terms

Emergency department (ED) visits for opioid toxicity: Includes unscheduled ED visits for opioid poisoning. Includes hospital data (i.e., ICD-10-CA codes) for poisoning by substances including: opium, heroin, codeine and derivatives, morphine, hydromorphone, oxycodone, other opioids not elsewhere classified, methadone, fentanyl and derivatives, tramadol, other synthetic narcotics not elsewhere classified, other and unspecified narcotics (Ontario Agency for Health Protection and Promotion (Public Health Ontario), 2023).

Deaths from opioid poisoning: Includes all deaths where opioid poisoning was considered as contributing to the cause of death (Ontario Agency for Health Protection and Promotion (Public Health Ontario), 2023).

Foils provided: Foil sheets are commonly distributed through harm reduction services, as they are used as a heating surface to smoke drugs that produce inhalable vapours, including opioids such as heroin or crushed pharmaceuticals including Oxycodone (Strike, et al., 2021).

Harm reduction: Harm reduction refers to policies, programs and practices that aim to reduce the negative health, social and legal impacts associated with drug use, drug policies and drug laws (International Harm Reduction Association, 2021). It focuses on working with people without judgment or requiring that people stop using drugs (International Harm Reduction Association, 2021).

Harm reduction services: Harm reduction services can support people to stay safer while using drugs, and can support people to access a range of health and social services to support basic needs (CATIE, 2023). Harm reduction services developed to reduce morbidity and mortality associated with opioid use include: naloxone distribution programs, needle and syringe services programs, safer inhalation kits, education about overdose prevention, and screening and referrals to prevent and treat viral Hepatitis, HIV, and sexually transmitted diseases (Miskovic, Beaumont, Conway, & Zurba, 2020).

Naloxone: Naloxone is a drug that can temporarily reverse an opioid overdose. Naloxone doses and kits are distributed through the Ontario Naloxone program, and are administered through injection or an intranasal spray (Government of Ontario, 2023).

Needle and syringe programs (NSP): NSP supplies often included in safer injection supply kits include supplies for drug preparation (e.g., antiseptic wipes, sterile water, cookers, and filters) and for injecting drugs (e.g., needles, syringes, tourniquets, alcohol swabs, and dry swabs) (Miskovic, Beaumont, Conway, & Zurba, 2020; Strike, et al., 2021).

Quintiles: Quintiles are used in the snapshot tool to see how public health unit regions compare to one another for a specific indicator. Quintiles are calculated by ranking each public health unit region for the indicator from the lowest rate to the highest rate. The ranked list is then separated into 5 groups from Quintile 1 to Quintile 5.

Opioid Agonist Therapy (OAT): OAT is an effective treatment for addiction to opioid drugs. OAT involves taking opioid agonists such as methadone or buprenorphine, which reduces cravings and prevents withdrawal for opioid drugs, and has been shown to reduce the risk of death among people with opioid use disorder (Centre for Addiction and Mental Health, 2016).

Rates: Rates are the count of an indicator divided by the size of the population. They are shown by a unit of population (e.g., per 1,000 or per 100,000). Rates allow us to compare an indicator over time, between regions or between demographic groups. They are the primary measure used in the snapshots.

Type of opioid present at death: Includes deaths from specific types of opioids. Opioids present at death included in the data used in this report were: codeine, fentanyl, heroin, hydrocodone, hydromorphone, methadone, morphine, nitazenes and oxycodone (Ontario Agency for Health Protection and Promotion (Public Health Ontario), 2023).

Background

Local public health units across the province have identified substance use and harm reduction among the most vital public health issues to prioritize during the COVID-19 pandemic recovery period (Association of Local Public Health Agencies (ALPHA), 2022). The drug poisoning crisis was in full force in 2019, but accelerated during the COVID-19 pandemic, with opioid-related deaths in Ontario increasing by 60% between 2019 (n = 1517 deaths) and 2020 (n = 2426 deaths) (Gomes, et al., 2021). Unregulated drug supplies have grown increasingly toxic and unpredictable, and public health agencies in Ontario have been challenged with managing the public health emergencies related to the opioid toxicity crisis and the COVID-19 pandemic. There is an urgent need for robust policies and harm reduction services in Ontario to prevent and mitigate harms associated with drug use and the unpredictable drug supply. To make improvements and further address the drug toxicity crisis, several public health units (PHUs) and harm reduction agencies from across the province came together on a Locally Driven Collaborative Project (LDCP), funded by Public Health Ontario (PHO), to understand what has been happening related to harm reduction service delivery and opioid-related morbidity and mortality in Ontario in recent years (Friesen, et al., 2021). This project created the opportunity to streamline available data from the Ontario Drug Policy Research Network's (ODPRN) [Ontario Opioid Indicator Tool](#) and PHO's [Interactive Opioid Tool](#) to provide PHUs with consolidated, contextualized information tailored to their regions.

Harm reduction services

Harm reduction refers to policies, programs and practices that aim to reduce the negative health, social and legal impacts associated with drug use, drug policies and drug laws (International Harm Reduction Association, 2021). Harm reduction services can support people to stay safer while using drugs, and can support people to access a range of health and social services to support basic needs and be safer and healthier (CATIE, 2023; BC Centre for Disease Control, 2023). There are a wide variety of harm reduction services in Ontario including the provision of single use supplies for safer drug preparation and use to minimize injury, infection, or disease transmission, prescription options like Opioid Agonist Therapy (OAT) to reduce risks of unregulated opioids, and tools to prevent overdose deaths (e.g., Naloxone) (CATIE, 2023).

NEEDLE AND SYRINGE DISTRIBUTION PROGRAMS (NSP)

NSP supplies often included in safer injection supply kits include supplies for drug preparation (e.g., antiseptic wipes, sterile water, cookers, and filters) and for injecting drugs (e.g., needles, syringes, tourniquets, alcohol swabs, and dry swabs) (Miskovic, Beaumont, Conway, & Zurba, 2020; Strike, et al., 2021). There is a risk of disease transmission when equipment used to prepare, share or inject the drug solution are contaminated with HIV, HCV, HBV or other pathogens. Even the smallest traces of blood can remain on used injection equipment (Strike, et al., 2021). There is also risk of infection when using non-sterile equipment, and risks of bacterial infection if hands are not washed with soap and water or a cleaning wipe prior to preparing or using tools and substances (Canadian Mental Health Association, 2023). The number of people who inject drugs (PWID) is unclear, however an estimate calculated by Jacka et al. estimated that the population of PWID in Canada in 2016 was approximately 171,000, and the number of PWID in Ontario in that year was 76,700 (Jacka, et al., 2020). Results from Canadian studies indicate that the percentages of people who inject drugs with a used needle has varied from approximately 9% to 27% (Tarasuk, et al., 2020; Fischer, et al., 2005). Clients of NSP's who are provided

a high level of supply coverage (i.e., the number of syringes provided) are significantly less likely to share syringes compared to those with reduced access (Strike, et al., 2021). Studies have shown an association between syringe sharing and difficulty accessing sterile equipment and that these relationships are often exacerbated in nonurban regions, reinforcing the importance of examining trends in rural and remote areas (Paquette & Pollini, 2018).

SAFER INHALATION KITS

Safer smoking supplies allow individuals to decrease their risk of injury (e.g., burns) and decrease risk of disease transmission (e.g., HIV and Hepatitis C) (Strike, et al., 2021; Canadian Mental Health Association, 2023). Examples of safer smoking supplies for drugs that are smoked, such as crack cocaine, include screens (to hold the drug in place and away from the mouth), pipes or stems (to inhale the vapour), and mouthpieces (to protect the mouth from burns) (Miskovic, Beaumont, Conway, & Zurba, 2020). Safer smoking supplies for drugs such as crystal methamphetamine include distribution of ball/bowl pipes (to heat and inhale the drug) and mouth pieces (Miskovic, Beaumont, Conway, & Zurba, 2020). Foil sheets are also commonly distributed through harm reduction services, as they can be used as a heating surface to smoke drugs that produce inhalable vapours, including opioids such as heroin or crushed pharmaceuticals including Oxycodone. Straws available through harm reduction services vapourised, or to snort drugs. Drugs that can be snorted include opioids like heroin, fentanyl, oxycodone, and hydrocodone, as well as stimulants, including cocaine and methamphetamine. The risk of overdose and transmission of blood-borne viruses is considered lower for drugs that are snorted or vaporized than when drugs are injected (Miskovic, Beaumont, Conway, & Zurba, 2020).

The items for safer smoking, inhaling and snorting may depend on the drugs available in specific communities, and client needs, and can be distributed as individual supplies or kits (Miskovic, Beaumont, Conway, & Zurba, 2020).

OPIOID AGONIST THERAPY (OAT)

OAT is an effective treatment for addiction to opioid drugs (including fentanyl, heroin, oxycodone, hydromorphone, and Percocet) (Centre for Addiction and Mental Health, 2016). OAT involves taking the opioid agonists such as methadone or buprenorphine, which reduces cravings and prevents withdrawal for opioid drugs, and has been shown to reduce the risk of death among people with opioid use disorder (Centre for Addiction and Mental Health, 2016; Kitchen, et al., 2022). OAT is prescribed and comes in several different forms (e.g., injectables, subdermal implants, drink or pill forms) (Centre for Addiction and Mental Health, 2016). Regular interaction with a prescribing clinician and supervised dosing on a daily basis is required until people are eligible for take-home doses. OAT can support individuals who use opioids to reduce the harms related to drug use (Kitchen, et al., 2022). Studies in Ontario have shown that there are barriers to accessing OAT, particularly in northern and rural areas, due to barriers including lack of physicians, distances to pharmacies, and generally much larger distances to accessing addiction support services (Franklyn, Eibl, Lightfoot, & Marsh, 2016).

NALOXONE DISTRIBUTION PROGRAMS

Naloxone is a medication used to temporarily reverse opioid overdose (BCCDC Harm Reduction Services, 2023). It has no effect on overdoses caused by other drugs, but because unregulated drugs may be contaminated with fentanyl, naloxone is still often administered to address any potential opioids in the system (Canadian Mental Health Association, 2023). Naloxone kits are distributed through the Ontario

Naloxone program, and come in nasal spray and injectable forms, along with directions for the person administering the medication (Government of Ontario, 2023).

Changes to the harm reduction service landscape

A brief review of the literature was conducted as part of the LDCP to understand how access, availability and uptake of harm reduction interventions and services have changed in North America over the pandemic. Capacity restrictions and physical distancing were hurdles for harm reduction facilities like clinics, syringe services programs, social service walk-in centres, shelters, and supervised consumption sites. Mandates limited the number of clients permitted in facilities at one time and how many patients could be admitted or treated per day (Canadian Centre on Substance Use and Addiction, 2020). In addition to reduced operating hours, some harm reduction facilities stopped accepting walk-ins and became appointment-only, leading to longer waitlist times (Canadian Centre on Substance Use and Addiction, 2020). Facilities also reported difficulty communicating closures, re-openings, and changes to hours of service to clients, and many services were shut down altogether (Canadian Centre on Substance Use and Addiction, 2020). Physical distancing guidelines contradicted best practices for safer consumption, such as being accompanied by another person or utilizing assisted injection services (Wilkinson, Hines, Holland, Mandal, & Phipps, 2020). Innovations and benefits also emerged in harm reduction service delivery in Ontario over the pandemic. There was an increase in outreach and mobile services in Ontario during this time. And more community collaboration occurred to provide outreach and mobile services.

Needle and Syringe Programs (NSPs) single-use injection equipment, resources for safe equipment disposal, naloxone, HIV and HCV testing, and substance use treatment or referrals (Bartholomew, Nakamura, Metsch, & Tookes, 2020). A majority of NSPs remained open with physical distancing protocols, COVID-19 screening, and personal protective equipment for staff, however, they often worked under restricted hours of operation (Bartholomew, Nakamura, Metsch, & Tookes, 2020). If closed, the length of time before reopening depended on if NSPs were considered as an essential service or how quickly a site could receive an essential service designation (Frost, et al., 2022). Many programs reduced or discontinued HIV/HCV testing and other medical services but successfully shifted their equipment distribution strategy from fixed site to mobile or mail-based delivery (Bartholomew, Nakamura, Metsch, & Tookes, 2020; Wenger, et al., 2021). Alternative distribution strategies were particularly valuable for reaching persons with mobility challenges, who are without access to public transportation, and who live in rural communities (Wenger, et al., 2021; Rains, et al., 2022). Despite underfunding and short staffing, many NSPs survived because of innovations (e.g., consults via telemedicine, mobile delivery, self-serve models, encouragement of secondary distribution) developed by resilient and committed staff and volunteers (Wenger, et al., 2021).

Harm reduction interventions historically have been focused on the needs of people who inject drugs with some attention towards other modes of consumption, like inhalation. However, between 2018 and June of 2021 in Ontario, 49.9% of opioid-toxicity related deaths involved inhalation or smoking, and 29.7% involved an injection (Cheng, et al., 2022). Also within that time frame, a stimulant (most commonly cocaine or methamphetamines) was also present in 54.9% of opioid toxicity deaths (Cheng, et al., 2022). This LDCP considered a range of indicators to examine changes to harm reduction services, keeping in mind the changing landscape related to how drugs are being used.

Access to harm reduction services and supplies in rural and remote resources were existing issues prior to pandemic onset. People in non-urban communities who use drugs face a greater risk of poisoning, morbidity and mortality, and were often also at increased risk of COVID-19 related harms due to unique challenges faced by these communities (Mental Health Commission of Canada, 2021). The pandemic exacerbated existing gaps in mental health and harm reduction services and supports, and other substance use treatment services (Mental Health Commission of Canada, 2021). As such, there is value in examining regional impacts related to the COVID-19 pandemic within Ontario, which includes many rural and remote communities, to enhance situational awareness and inform provision of more accessible services moving forward.

Current Project

The last few years have clearly seen unprecedented challenges and changes to health systems on a global scale, and vulnerable populations have been disproportionately impacted. Data on the spatial distribution of harm reduction service delivery and opioid overdose deaths can inform more targeted, community-based strategies⁷.

Objectives

The proposed collaborative project aimed to describe regional changes to harm reduction service delivery in Ontario and the relationship of these changes to opioid-related morbidity and mortality over the course of the COVID-19 pandemic.

The following research questions were proposed:

1. How has harm reduction service delivery changed within each PHU region in Ontario since 2017?
2. What is the relationship of these changes to opioid-related morbidity and mortality over the course of the COVID-19 pandemic?

Findings will help us to understand what has transpired regionally within the province over the course of the pandemic, how our communities have been impacted by shifts in service delivery, which areas require the greatest levels of support, and how we can come together at the provincial and local levels to strengthen harm reduction programming moving forward. It will be particularly beneficial to understand where our most under-resourced areas are, to have data to support this, and to use findings for advocacy to support harm reduction programming and policies in Ontario.

Results will be shared with all PHUs in Ontario, and with key networks and organizations identified by each PHU who specialize in harm reduction research, advocacy and programming. Public health units will be encouraged to share their specific snapshots with partners in their local networks, including individuals with lived experience, to support programming and regional efforts to address the drug toxicity crisis. Findings will be used to advocate for support to improve or expand harm reduction services in Ontario.

Methodology

Project Team

All PHUs in the province were invited to join the project group, along with some key organizations who specialize in harm reduction programming. Many were interested in the project work but did not have the capacity to join the project group. Several others committed to joining the project stakeholder group.

The project stakeholder group included representation from the following organizations:

- KFL&A Public Health
- ODPRN
- Toronto Public Health
- Grey Bruce Health Unit
- Peterborough Public Health
- ODPRN's Lived Experience Advisory Group (LEAG)
- Ontario Harm Reduction Distribution Program (OHRDP)
- City of Hamilton Public Health
- Peel Public Health
- Public Health Sudbury & Districts
- Huron Perth Public Health
- Public Health Ontario
- Queen's University

Stakeholders in the broader project group participated in the objectives and design of the project and provided input at each key stage of the project.

The core project working group was responsible for carrying out the work between the broader project group meetings and included input from managers, research associates and epidemiologists from KFL&A Public Health, ODPRN and Toronto Public Health. Staff from KFL&A Public Health were responsible for project management and dashboard development. Working group members from ODPRN provided the data to KFL&A Public Health and connected the group with LEAG members; ODPRN and Toronto Public Health offered feedback on each snapshot iteration.

Members from LEAG were invited to join the project, agreed to participate, and were reimbursed for their time throughout. At the project onset, LEAG members provided input into which data indicators were selected for the dashboard, alongside the broader project group, and offered feedback that shaped the final version of the snapshots. They also provided invaluable context and interpretation surrounding the results.

Students from Queen's University also contributed to project deliverables (e.g., a literature review, embedded within this report, and the future dissemination of findings).

Ethical Considerations

The data used for this project are aggregated and available publicly. Core project members at ODPRN had access to the required aggregated data from the Ministry of Health (MOH) for public posting

on their website. Data are displayed in a manner that protects individuals’ privacy and mitigates risk of individual-level impacts. Each project member was responsible for ensuring that they followed the privacy policies and procedures of their respective institutions.

This project aimed to mitigate stigma associated with substance use by engaging partners who specialize in harm reduction, including people with lived and living experience, at each project phase. Results will be shared with all PHUs, who will be encouraged to share findings with their community partners to further strengthen harm reduction in their respective communities.

Ethics approval was obtained on November 29, 2022 from Queen’s University Health Sciences Research and Affiliated Teaching Hospitals Ethics Board.

Data sources

Program-level harm reduction services data and surveillance data at the PHU level were used to create snapshots for each of the 34 PHUs in Ontario. Data sources included ODPRN’s Ontario Opioid Indicator Tool ([See technical appendix](#)) and PHO Interactive Opioid Tool ([See technical appendix](#)). Co-applicants at ODPRN had access to the required aggregated data from the MOH, with permission to post the data publicly on their website.

Indicator Selection

The indicator selection process included discussions about the available indicators at project meetings, followed by a questionnaire completed by project members, where indicators were ranked in terms of most pertinent to informing situational awareness. The following table displays the harm reduction service indicators included in the snapshots.

Harm Reduction Service Delivery Indicators	Data Source
Needles provided	Ontario Opioid Indicator Tool by ODPRN
Naloxone doses provided	Ontario Opioid Indicator Tool by ODPRN
Foils provided	Ontario Opioid Indicator Tool by ODPRN
Individuals dispensed Opioid Agonist Therapy (OAT)	Ontario Opioid Indicator Tool by ODPRN
Opioid-related Morbidity and Mortality Indicators	
Emergency department (ED) visits	Interactive Opioid Tool by Public Health Ontario
Opioid toxicity deaths	Interactive Opioid Tool by Public Health Ontario

For each indicator counts, rates (per 1,000), ranking compared to Ontario, by quintile compared to all PHUs, and recent (2021) and ongoing (2016 onwards) trends are reported. The opioid-related morbidity and mortality indicators selected were: emergency department (ED) visits related to opioids, opioid-related deaths, and type of opioid present at death. Counts, rates (per 100,000), and a ranking (by quintile) compared to Ontario are reported for ED visits and opioid-related deaths, as well as trends by

age and sex. Percent of deaths was reported for “type of opioid present at death”, and drug type categories included: fentanyl, methadone, hydromorphone, oxycodone, codeine, morphine, carfentanil, nitazenes, heroin, and hydrocodone.

Snapshot development

Epidemiologists and research associates, and knowledge translation specialists from KFL&A Public Health and ODPRN combined their skillsets to develop the snapshots. The team at ODPRN accessed the aggregated data used to generate the snapshots. KFL&A Public Health conducted additional data analyses, built the database and developed the snapshot dashboard to display the data. All data used was publicly available aggregate data. No record level data was used for the snapshots.

Snapshots were created with Power BI. Each page of the PHU regional snapshot dashboard depicts the key indicators above, and how they have changed between January 2016 and December 2021. A drop-down feature allows users to navigate between PHU regions.

The snapshot dashboard includes the following pages:

INTRODUCTORY PAGE: This page was created after a consultation with LEAG members, to provide a visually leaner overview of some main findings and some pertinent definitions needed to interpret the main page.

MAIN PAGE: This page includes the majority of the findings, and displays all the selected indicators, quintile comparisons to Ontario, and trends by age and sex.

MAPS PAGE: This page includes a visual depiction of changing trends in Ontario geographically and allows users to zoom to specific regions, or press “play” and visually explore how trends have changed over time. Maps are available by rates and by quintiles.

TRENDS PAGE: This page allows users to explore findings by indicator and see trends across all 34 PHU regions in one glance.

NOTES PAGE: This page includes the technical guidance pieces needed to understand the snapshot tool.

Data Analysis

Regional snapshots included summary statistics (e.g., rates, counts) and changes (e.g., $\geq 10\%$ or $\leq -10\%$ change) in key indicators over the course of the pandemic. Statistical process control methods were used to assess long-term trends. Indicators which saw consecutive increases from 2018 to 2021 were deemed to have increased, while those with consecutive decreases from 2018 to 2021 were deemed to have decreased. Recent changes were assessed by determining if there had been equal to or more than a 10% increase or decrease from 2020 to 2021.

For objective #2, key data indicators were displayed over time visually, so that changes in harm reduction service indicators could be seen alongside changes in health impact. No statistical tests were performed to determine change over time or differences between PHUs or Ontario. The trends reported are observational.

Ontario-level summary statistics on the key indicators selected for inclusion by the study group were included where available for comparison purposes. These trends are also visualized by PHU area, so that each PHU can examine the trends in their areas. Overarching trends are summarized in this report and will be included in knowledge exchange activities related to the project. Differences between individual PHUs and Ontario were determined by a 10% difference (above or below) between the PHU's rate for an indicator and Ontario. Quintiles were defined for each indicator by rate. All analyses were performed in R version 1.1.1.

Contextual Findings

The depth and diversity of perspectives gleaned from the individuals involved in this project were incredibly valuable in the interpretation of the findings. Project members were consulted to provide additional context and interpretation around the data and themes that emerged in their respective regions. The combined feedback was gathered through a survey, summarized and incorporated into the knowledge translation (KT) deliverables, and informed the interpretation of the findings, implications of the work, and next steps to improve harm reduction service delivery in Ontario.

Project Evaluation

Process and outcome evaluations were conducted to ensure that the project was implemented and completed as planned. See Appendix B for evaluation objectives, methodology, and results.

Results

Harm Reduction Service Snapshots:

Please find the snapshots [here](#)

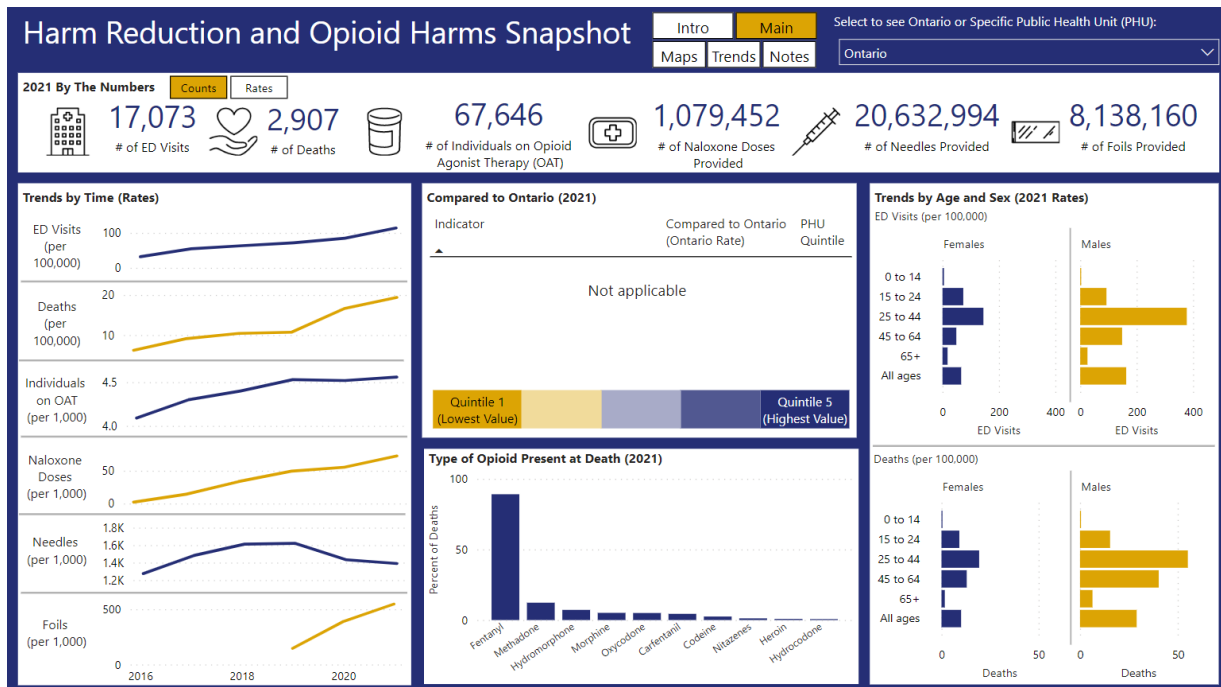


Image: A screen capture of the main snapshot page displaying Ontario level data

Changes in Opioid-Related Morbidity and Mortality:

Opioid-related emergency department visits

Emergency department (ED) visits have steadily increased in Ontario since 2016 (i.e., from 31.7 per 100,000 in 2016 to 114.0 per 100,000 in 2021). An upward trend in ED visit rate occurred in each of the 34 health unit regions in the province since 2016. Looking at more recent years since pandemic onset in 2020, the rate of opioid-related ED visits in Ontario increased from 84.6 per 100,000 (n=12,527) in 2020 to 114 per 100,000 (n=17,073) in 2021. Between 2020 and 2021, the number of opioid-related ED visits increased in 29 PHU regions by 10% or more, and remained similar in 5 PHUs regions. Amongst both females and males in Ontario, rates of ED visits were highest amongst the 25- to 44-year-old age group. Trends by sex were similar across most PHUs. Males aged 25-44 had the highest ED visit rates in every health unit region. In most regions, females aged 25-44 had higher ED visit rates related to opioids than other age groups; however, there were a few exceptions (e.g., with females aged 15-24 or over 45 with higher ED visit rates). Overall, in Ontario and across regions, males (163.0 per 100,000) had higher rates of ED visits compared to females (66.2 per 100,000).

Opioid deaths

Opioid death rates have increased substantially in Ontario over the last few years, from 6.2 per 100,000 (n=868 deaths) in 2016 compared to 19.4 per 100,000 (n=2,907 deaths) in 2021. Opioid-related deaths have increased in all but one health unit region (Timiskaming) since 2016. In Timiskaming health unit region, there were 4 deaths in 2021 compared to 3 in 2016; however this number did increase to 7 in 2020. Overall trends across Ontario from 2018 to 2021 indicate that opioid-related deaths have either continuously increased or remained similar for each PHU region. Taking a closer look since the pandemic onset across Ontario, we found that between 2020 and 2021, the rate of opioid deaths increased from 16.6 per 100,000 in 2020 to 19.4 per 100,000 in 2021. The rate of opioid-related deaths increased in the majority of PHU regions. Specifically, opioid-related deaths increased by 10% or more in 23 regions, remained similar in eight, and decreased by 10% or more in three regions.

Death rates were higher in males (29.0 per 100,000) than females (10.1 per 100,000), and those aged 25-44 compared to other age categories for both males (55.2 per 100,000) and females (19.4 per 100,000), respectively. Most health unit regions observed these trends, however there were some differences in these trends by region. Males aged 25-44 had the highest rates of ED visits among all 34 health unit regions, and had the highest death rates in all but three regions (those aged 45-64 had the highest death rates in KFL&A, Northwestern, and Toronto public health regions). In most health unit regions, females and males aged 25-44 experienced the highest rates of ED visits and opioid-related deaths. Exceptions to this included Grey Bruce Health and Region of Waterloo, where females aged 15-24 observed higher ED and death rates compared to females in other age categories. In Wellington-Dufferin-Guelph, females aged 15-24 had higher opioid-related ED visits than other female age categories, but females aged 45-64 had the highest death rates. In Haldimand-Norfolk Health Unit, Halton Region, and Kingston, Frontenac, Lennox & Addington (KFL&A), females aged 25-44 had higher rates of ED visits, but females aged 15-24 had higher opioid-related death rates. In Timiskaming, females aged 45-64 had the highest ED visit rate, and there was not enough data to display death data by age for females. In Brant County, KFL&A, Northwestern, and Toronto public health unit regions, females aged 45-64 had higher death rates than other age categories for females. The final exception found for age

trends across the province (again, where the majority found the highest risk category was aged 25-44), was in Eastern health unit region, where ED visits were highest among females in the 25-44 age range, but death rates were higher in females aged 65 and older.

Fentanyl accounted for 89.1% of opioid-related deaths in Ontario in 2021. Fentanyl was the opioid most commonly present at death among all PHU regions over this time. AT When looking at individual health unit regions, the five regions that observed the highest proportion of fentanyl-related deaths were: Sudbury Public Health (fentanyl present in 95.0% of opioid toxicity deaths), Peterborough Public Health (94.9% of opioid toxicity deaths), Algoma Public Health (94.7% of opioid toxicity deaths), Chatham-Kent Public Health (94.1% of opioid toxicity deaths), and Region of Waterloo (92.7% of opioid toxicity deaths).

The areas with the lowest proportion of fentanyl-related deaths were: Leeds, Grenville & Lanark District Health Unit (64.3% of opioid toxicity deaths), Northwestern Health Unit (74.2%), Renfrew County and District Health Unit (77.8% of opioid toxicity deaths), Southwestern public Health (79.5% of opioid toxicity deaths), Haldimand-Norfolk Health Unit (80.0%), and Huron Perth Health Unit (80.0%).

Timiskaming Health Unit was not included in the summary above for fentanyl-related deaths, since numbers were suppressed in the analysis due to small cell counts.

Harm Reduction Service Delivery Changes

Foils

Across Ontario, the number of foils provided increased since their introduction to the Ontario Harm Reduction Distribution program in 2019, rising approximately 42% from 5.7 million foils (389.6 per 1000) in 2020, to 8.1 million foils (548.0 per 1000) in 2021. Foils provided has increased in all but one health unit region (York) since this time. Between 2020 and 2021, foil provision rates increased by 10% or greater in 30 regions, remained similar in 2 regions (Sudbury, Thunder Bay), and decreased by 10% or greater in 2 regions (North Bay Parry Sound, York).

Needles

In 2016, over 17 million needles were distributed in Ontario (1273 per 1000), which increased 38% to reach a high of 23.5 million (1620 per 1000) in 2019, and subsequently decreased to 20.6 million needles distributed in 2021 (1389 per 1000). Between 2020 and 2021 there was considerable variation in trends of needle distribution between PHUs; the number of needles provided increased by 10% or greater in 8 PHU regions, decreased by 10% or greater in 15 PHU regions, and remained similar in 11.

Naloxone

The number of naloxone kits provided (which often include >1 dose) has increased substantially in Ontario over the last several years. In 2016, 28,222 naloxone doses were provided (2 per 1000), rising 3724% to 1,079,452 in 2021 (73 per 1000). Between 2020 and 2021, the # of naloxone doses provided increased by 10% or greater in 27 regions, decreased by 10% or greater in 3 regions (Haldimand Norfolk, Hastings Price Edward County, and Haliburton, Kawartha, Pine Ridge health unit areas), and remained stable in four regions (Northwestern, Wellington Dufferin Guelph, North Bay Parry Sound, and Peel).

Individuals on OAT

The number of individuals receiving OAT in Ontario has gradually increased over time, rising 18% from 57,296 individuals on OAT in 2016 to 67,646 individuals on OAT in 2021. Between 2020 and 2021

the number of individuals on OAT remained similar in 32 PHU regions and increased by >10% in two regions (Algoma and Porcupine).

Trends Between Harm Reduction Service Delivery Changes and Opioid-Related Morbidity and Mortality

With some exceptions (e.g., # needles provided), the opioid-related service delivery and opioid-related harms indicators included in the snapshots have increased in Ontario over the pandemic.

Contextual observations related to snapshot findings

All project members were asked for their feedback around snapshot findings through a survey. Thirteen participants completed the survey, including representation from organizations and LEAG members from various regions across the province. Respondents noted working or residing in the following regions: Toronto, Huron Perth, Grey Bruce, KFL&A, Leeds, Grenville & Lanark, Peel, Peterborough, and Thunder Bay health unit regions. Others reported that their region is “Ontario”.

Opioid-related morbidity and mortality

When asked which factors have contributed most to changes in opioid-related morbidity and mortality in their specific regions over the past few years, almost all respondents (12/13) attributed the increasingly toxic unregulated drug supply as the biggest contributor. Other contributing factors that emerged as themes included increased isolation (n = 4), and reduced services and limited access to safe supply and safer inhalation services (n = 4).

Respondents were asked if there was anything else they wanted to highlight about the findings related to opioid-related mortality and morbidity, either specific to their region or more broadly. No themes emerged as this question generated unique responses.

Changes in harm reduction service delivery

Project members were asked to comment on how harm reduction service delivery has changed in their regions since 2020 onwards. Several changes were noted, and different regions reported different changes. Examples of some of the changes mentioned by respondents include:

- Decreased service hours
- Service closures
- Limited staffing resources
- Changes in supplies to meet changes in consumption (e.g., increased inhalation)
- Service delivery models becoming more client-focused
- Strengthened partnerships, which facilitated increased access
- Additional services were added (beyond what is shown in the snapshots)
- Some services have become more accessible, mobile and low barrier (one PHU noted attributed decreased opioid-related harms in their region to this change)
- Decreased opportunities for building therapeutic relationships with clients through self-serve models

When asked, through an open-ended question, what is needed most to improve harm reduction service delivery in respondents’ regions, the top 3 most frequent responses included:

- A more comprehensive, robust approach to harm reduction (n=9)
- More funding for harm reduction services (n=7)
- Safer supply (n=5)

Responses to this question also elicited a diverse range of perspectives and needs, in addition to the above, highlighting the potentially diverse needs of HU's across Ontario.

Intended Use of Snapshots

Project members were asked to share how they plan to use the snapshots, and the findings within them. Thirteen individuals responded to this question, and were able to select more than one response option. Group members plan to use the findings in the following ways:

- For advocacy (86%)
- For situational awareness (86%)
- To share with colleagues (79%)
- For program planning (50%)
- To improve policies (43%)

Discussion

This project compiled available evidence from two major data sources in the opioid health field into regional snapshots to display trends leading up to and during the COVID-19 pandemic related to harm reduction service delivery and opioid harms. The main impetus for these snapshots was utility, particularly by PHUs and community organizations who are addressing community challenges related to opioid use. The snapshots were created to facilitate greater situational awareness related to the changing landscape of harm reduction and opioid harms, and to act as an additional resource to leverage for advocacy efforts and program planning.

Since 2016, opioid toxicity ED visits and death rates have increased substantially in Ontario. Every health unit region in the province has observed increases in ED visit rates over this time period, and almost all have seen increases in opioid-related deaths. Fentanyl has become increasingly prominent in the drug supply in Canada, is more potent and toxic compared to many other opioids, and was present in 89.1% of opioid-related deaths in Ontario in 2021 (Federal, provincial, and territorial Special Advisory Committee on the Epidemic of Opioid Overdoses, 2023). When investigating trends through the current project, fentanyl was the opioid most commonly present at death among all of the 34 PHU regions in Ontario; however the proportion of opioid toxicity deaths attributed to fentanyl varied widely between some regions (e.g. 64.3% in Leeds, Grenville & Lanark, and approximately 95% in Sudbury and Peterborough regions). This implies differential supply and/or impact of the unregulated and regulated drug supplies in these regions and identifies an ongoing need to explore regionally-specific circumstances of opioid-related harm to identify appropriate responses tailored to local needs. There are also clear differences by region in harm reduction service provision and access to treatment. The underlying reasons for these regional differences may reflect different patterns or modes of substance use in each area, the underlying prevalence of opioid use disorder, and the contents of unregulated drug supply. For example, the observed decreases in needle provision in some regions may be indicative of shifting trends towards more inhalation of opioids compared to other modes of opioid use (Cheng, et al., 2022). The large quantities of supply distribution in other PHU regions (e.g., remote

areas) may reflect increased and/or differing needs of individuals who have less access and more barriers (e.g., physical distance) to harm reduction services (Mental Health Commission of Canada, 2021). Due to regional differences, findings also highlight that certain regions may require enhanced service or support to address the drug toxicity crisis in the areas in which death rates are highest.

The social determinants of health by region are of critical importance to consider in gaining a deeper understanding of opioid-related trends across the province. Overall, in Ontario, rates of opioid-related ED visits and deaths were higher in males than females, and with some exceptions by region, those aged 25-44 tended to be at highest risk. These trends are similar to those observed in Canada as a whole, in which health harms associated with opioid use are much higher in males than females (Federal, provincial, and territorial Special Advisory Committee on the Epidemic of Opioid Overdoses, 2023). Observationally, findings from the snapshots indicate that males aged 25-44 had the highest ED visit rates in all health unit regions, and highest death rates in all but three regions (i.e., KFL&A, Northwestern and Toronto Public Health, in which males aged 45-64 had higher death rates). Certain regions in Ontario observed higher rates of opioid-related deaths in other female age groups. For example, in some regions, females aged 15-24 (Grey Bruce, Region of Waterloo, KFL&A), aged 45-64 years (Wellington-Dufferin-Guelph and Brant County) and aged 65 and older (Eastern Health Unit region) had slightly higher rates of opioid toxicity deaths compared to other female age groups. These findings were descriptive in nature. These sex-specific findings by region are worth investigating further to see if these differences are statistically significant

Although the data was not available, previous research shows that further inequities related to opioid related morbidity exist beyond age and sex, and extend to other social determinants of health (Alsabbagh, et al., 2022). For example, First Nations and Metis, rural and remote communities, and unhoused individuals have been disproportionately impacted by COVID-19 and the drug toxicity crisis (Mental Health Commission of Canada, 2021; Gomes, et al., 2022) . A social-ecological approach that addresses the social determinants of health should be considered as part of a comprehensive strategy that addresses the drug toxicity crisis. Moreover, many First Nations, Inuit and Metis live in rural and remote areas and hold valuable perspectives that offer healing and a path forward to address substance use, mental health, and the impacts of the pandemic. Thoughtful solutions that take into account the systemic harms placed on Indigenous people, and a conscious effort toward reconciliation and respect for Indigenous leadership and sovereignty are needed.

PHUs and harm reduction services across the province can consider these findings in light of their own data and understanding related to changes that have occurred over the COVID-19 pandemic related to the opioid toxicity crisis. Eight PHU's were represented on this LDCP group, along with individuals with lived and living experience, and organizations who specialize in harm reduction service delivery and policy development. The project group offered their own summaries related to the snapshot findings and spoke to the challenges and efforts made by PHUs and community-based services during the pandemic. Their feedback reflected that the pandemic created certain shifts in access to harm reduction services, including decreased service hours, limited staffing and service closures. These changes reportedly increased isolation, and decreased opportunities for client-service relationships. Other changes were perceived as the group as beneficial, including reduced barriers to service access for services that became more accessible and mobile, and strengthened partner relationships, which facilitated increased access. The project group shared that the pandemic resulted in innovations that may improve the quality of harm reduction service delivery moving forward. The group also highlighted

the potential benefits of mixed-model service delivery approaches to improve accessibility to services by different high-risk groups. For example, group members shared that some harm reduction service clients feel more comfortable with a self-serve model and are more likely to access services in this way. Other clients prefer a more relationship-based approach and prefer in-person services. Again, it is vital to understand clients' needs, as well as understanding the broader regional contexts when evaluating and improving harm reduction services.

Limitations

There are some limitations with the existing data to consider when interpreting the snapshot findings and using them to make decisions. We are unable to report how many received (or did not receive) services of those in need, and therefore, the available data do not comprehensively capture or measure gaps in support. This, in part, is because there is no known denominator for number of people who use drugs and/or the number of people who live with an opioid use disorder. Deaths involving injection or inhalation of opioids may not always reflect actual use in the population (i.e., among the living). The current study was also not inclusive of health harms related to opioid toxicity beyond ED visits and mortality (e.g., infectious diseases, injuries, etc.). The data included in the current study are very likely underestimates of the true rates of health harms associated with opioid toxicity in Ontario.

The data used for the snapshots do not provide a complete understanding of all service components that have changed over the pandemic related to harm reduction service delivery in Ontario. Further, this study's findings are not inclusive of all harm reduction supports delivered in each region. For example, data from supervised consumption sites is not currently publicly available. Also, bowl pipes provided, straight stems provided and straws provided were not included due to space restrictions. Those supplies are increasingly used to smoke and inhale substances in some regions, and can be found in the parallel [Ontario Opioid Indicator Tool by ODPRN](#). Therefore, results must be interpreted, knowing that the full extent of inhalation practices are not depicted in the snapshots. Another key limitation of the available data used for these snapshots is that a comprehensive range of socio-demographic information (e.g., race, income, education) related to opioid toxicity is not available, and age and sex data were not available for harm reduction service delivery provision indicators.

When interpreting the data, it is important to interpret observational associations between harm reduction service provision and opioid related morbidity and mortality with caution. Using the methodological approach and analysis we conducted, we are unable to determine if the changes in harm reduction service delivery we observed directly impacted any of the changes to opioid-related morbidity and mortality. For example, when observing increased distribution and supplies in the case of needle or foil provision, it is important to note that these services may not necessarily prevent opioid overdose deaths, but may reduce other harms associated with using drugs (e.g., infection, injury). Conclusions cannot be drawn from the current study related to *quantity* of supplies provided and *effectiveness* of harm reduction services in reducing opioid-related harms. This limitation is critical to consider in the interpretation of the findings in this project, and how they are used to inform efforts to improve harm reduction service delivery. This tool is intended to be one piece of evidence that sits within a broader body of evidence (e.g., through consideration of other available data that does account for other health harms such as the [Ontario Opioid Indicator Tool by ODPRN](#)), and other

quantitative/qualitative local data, to inform future planning of policy development and program delivery. The limitations listed above are also why this project is viewed as a foundational step that can inform further research and collaboration that considers the nuances, strengths and differences observed within and across regions.

Next Steps

Regional snapshots of harm reduction service delivery and opioid-related morbidity and mortality, along with an infographic for this report, will be presented to and shared with attendees at PHO rounds in May 2023, and will be available on ODPRN's website so that they are accessible more broadly and available beyond the project time period. The link to the snapshots will be shared with all PHUs in Ontario for their own use and to share with their community partners in harm reduction. The network and collaborative relationships built from this project may inform future collaborative opportunities that emerge from the findings. We hope that this project will be a stepping stone towards further collaborative work. For example, potential areas to explore further include:

- (a) Advocating for policy work to improve harm reduction services in Ontario
- (b) Conducting further qualitative research to add context to the findings and identify priority areas moving forward
- (c) Monitoring harm reduction service delivery in Ontario and predict changes in need
- (d) Conducting cost-effectiveness analyses to understand the cost-savings of harm reduction programming

Conclusions

There is variation between regions in Ontario in terms of accessibility to and needs for harm reduction services. Findings reinforce the need to invest in locally-driven responses that meet needs of specific regions and are based on the population, drug supply, and patterns of use, and unique needs of the diverse communities across the province. Differences observed between regions should be interpreted within the context of local patterns by health units and people working in community-based programs in these areas. It is hoped that the opioid harms snapshots can be considered as one piece of evidence along with other national, provincial, and regional evidence to enhance situational awareness, support advocacy for more funding, support decisions for resources allocation so that areas with high opioid harms receive further supports, and to inform more comprehensive and robust harm reduction service delivery and accessibility.

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