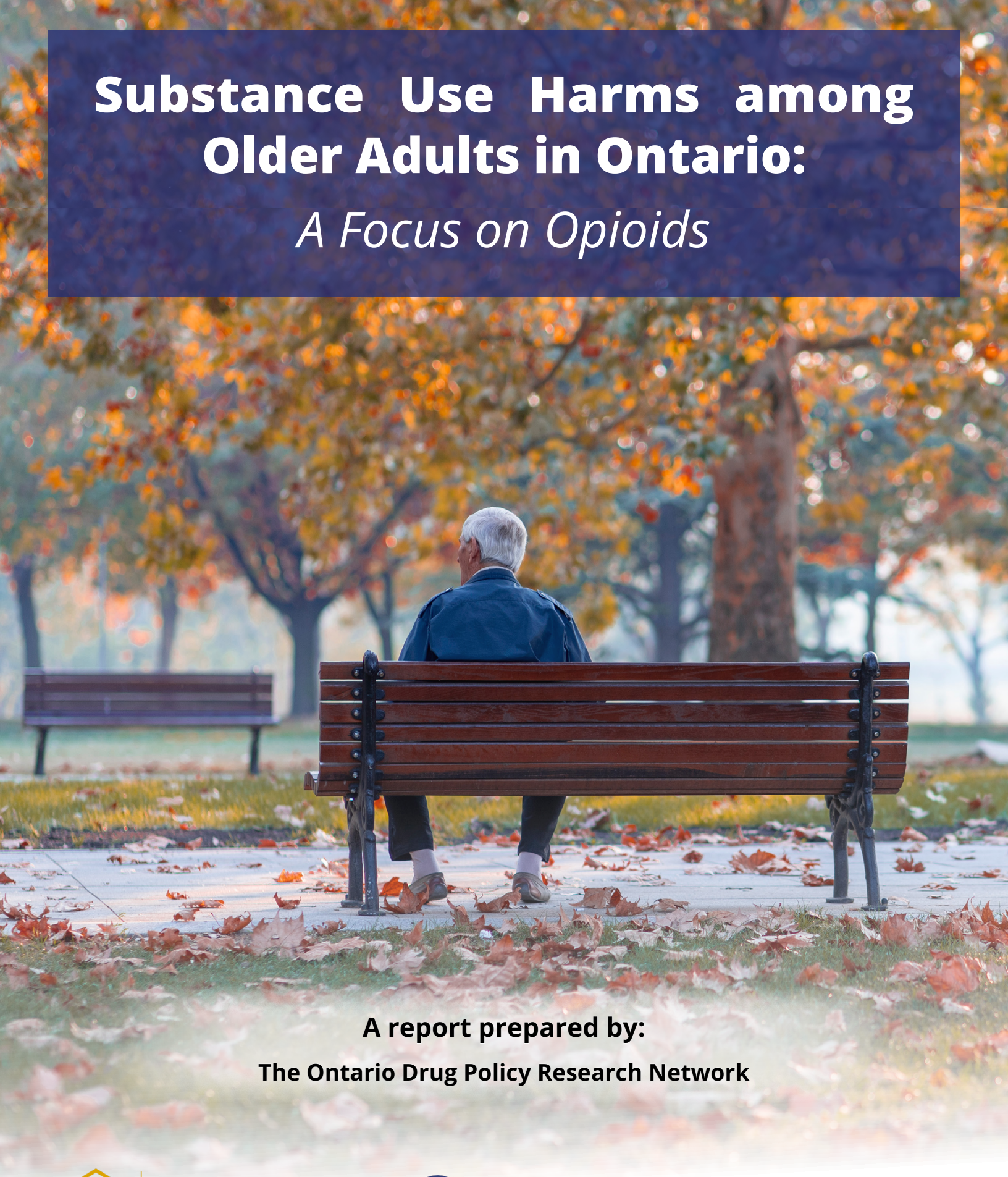
Substance Use Harms among Older Adults in Ontario:

A Focus on Opioids



A report prepared by:

The Ontario Drug Policy Research Network

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Ontario Opioid Drug Observatory

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Acknowledgments

The Ontario Drug Policy Research Network (ODPRN) wishes to acknowledge all families, friends, and loved ones of older adults who died from an opioid toxicity in Ontario, recognizing that this report does not sufficiently reflect the pain, grief, and trauma experienced by those who have lost important people in their lives. We hope that our findings will bring to light the nature of this often overlooked and evolving crisis among older adults and help inform programs and policies to prevent deaths in the future. We also acknowledge all those who use substances, harm reduction workers, peer support workers, first responders, and health care professionals who are working tirelessly to support affected individuals and families, including their enormous role in overdose response and resuscitation efforts. It is imperative that we remember that the statistics in this report reflect the lives of people who are loved and continue to be remembered, honoured, and grieved by their communities. We commit to working with our communities to find ways to use these findings to elevate the voices and experiences of those we have lost, with the goal of supporting responses that improve the lives and safety of people who use substances in Ontario and across Canada.

We acknowledge that the land on which we conduct this research is the traditional territory of a diverse group of First Nations Peoples across Ontario. The ODPRN conducts its work in Toronto, which is within the traditional territory of the Anishnabeg, the Chippewa, the Haudenosaunee and the Wendat peoples, and most recently the Mississaugas of the Credit. We hereby acknowledge the disproportionate impact the drug toxicity crisis has had on Indigenous Peoples across the country as a result of the current and continuing impacts of colonization, including the deep harms of the residential school system and the resulting intergenerational trauma.

We acknowledge the work of the entire death investigation service, including investigating coroners, toxicologists at the Centre of Forensic Sciences, pathologists at the Ontario Forensic Pathology Service (OFPS), nurse investigators and all support staff; their enduring commitment to a robust death investigation system has directly contributed to all of the data presented in this report. Finally, we acknowledge Emily Schneider, the ODPRN Lived Experience Advisory Group (LEAG), the Waterloo Wellington Older Adults and Substance Use Working Group, and the Wellington Guelph Drug Strategy (WGDS) for their contributions to this work.

Background

As the general Canadian population ages, there is a growing recognition that older adults are an important demographic living with opioid use disorder (OUD) who are exposed to the unregulated drug supply.[1-3] People currently entering older adulthood carry a greater lifetime burden of opioid exposure than any previous generation and have experienced some of the highest rates of opioid toxicity harms during mid-life, which has been shaped by historically elevated rates of unregulated drug use and the impacts of the rapid expansion of pharmaceutical opioid prescribing beginning in the mid-to-late 1990s.[4-6] Demographic shifts over the past decade towards an aging population—with the number of persons aged 65 and older in Canada increasing more than 40% between 2015 to 2025[7]—have made Canada's aging population a priority within the current and future landscape of the drug toxicity crisis.

Over the past decade, there has been a notable increase in the number of older adults receiving pharmacological treatments for OUD. Between 2015 and 2025, the number of opioid agonist therapy (OAT) recipients aged 65 and older in Ontario has increased more than 6-fold from 706 to 4,891 recipients annually. Alongside rising population-adjusted rates of OAT use in this population (from 0.27 to 1.49 per 1,000), trends point toward an increasing number of older adults seeking and accessing treatment for OUD in the province.[8] Opioid toxicity deaths have also increased among older adults in the province, in line with trends seen across other age groups, amid the proliferation of an increasing toxic and unpredictable unregulated drug supply, with population-adjusted rates growing from 1.6 to 5.2 deaths per 100,000 among people aged 65 and older between 2015 and 2024.[9] Taken together, rising engagements with substance use care, and at the same time, growing risks associated with the unregulated drug supply among older adults, signal the need for support for older populations within the drug toxicity crisis.

Opioid use and related harms among older adults can be shaped by risk factors that are distinct from those seen in younger populations. Age-related biological changes in how drugs are processed by the body may increase the potency, duration of action, and adverse effects of opioids, such that opioid exposure may carry elevated risk of harm for older adults relative to younger populations.[10] This is particularly important given that older adults experience a disproportionate burden of chronic and pain-related conditions that may warrant opioid analgesia as a component of pain management.[11,12] Drug utilization data across 6 Canadian provinces (including Ontario) identified people who are 65-74 and over 75 years old as having the highest rates of prescribed opioid use for pain management nationally.[13] Moreover, exposure to prescription opioids has been identified to play a more pronounced role in opioid toxicity harms among older adults (aged 65+) presenting to acute care settings compared to younger populations.[14] While these patterns may reflect treatment of pain-related needs as people age, the chronic use of prescribed opioids in this population still carries elevated risks for adverse effects and accidental toxicity, making careful clinical management a priority.[10,15] Substance use has also been associated with accelerated aging and earlier onset of age-related disease and morbidity, which can lead to increased clinical complexity and healthcare needs for people who use substances earlier in life compared to the general population.[16-18] As such, the complex needs of people who use substances in their mid-50s, who may be aging prematurely relative to their chronological age, warrants similar considerations to those typically reserved for individuals aged 65 and older. Beyond this, social factors such as loneliness, isolation, and lack of support, which are prevalent among older adults, have been increasingly linked to substance use in this population.[19,20]

The evolution of the unregulated drug supply—now primarily dominated by highly potent fentanyl and other adulterants—has altered opioid exposure and related risk environments for all age groups of people who use substances, including older adults. Notably, in 2022, over 40% of emergency department (ED)-treated opioid toxicities among people aged 65 and older in 4 Canadian provinces occurred without any evidence of a dispensed prescription opioid, which implicates non-prescribed opioids (particularly the unregulated drug supply) as an important exposure source for this population.[14] Amid the changing drug landscape, it is important to assess evolving risk environments in this age group, beyond the historical focus on prescribed opioids. Importantly, the initiation and overall use of prescribed opioids have also seen notable declines

in Canada in recent years, in line with implemented clinical guidelines and policy interventions aimed at promoting safer prescribing and improved regulation of opioid access.[13,21] While this may have mitigated harms from pharmaceutical opioids, adults with long-standing use of opioids due to complex pain management needs have been identified as particularly at risk of the unintended consequences of changing opioid access, including undertreated pain, reduced quality of life, and potential diversion to unregulated opioid sources.[4,22-24]

There has been little research on the evolving patterns of opioid toxicity harms and OUD in the population of older adults, particularly at the intersection of both unregulated and prescribed opioid use. Accordingly, we sought to (i) describe trends over time in OUD-related healthcare interactions, OAT use, and opioid toxicity harms (fatal and non-fatal) among adults aged 55 years and older; and (ii) to characterize fatal opioid toxicity deaths in this age group including demographic characteristics, circumstances surrounding death, substance involvement, healthcare interactions, and health history preceding death.

The aim of this work is to raise awareness and help inform health system planning—including for institutional settings such as long-term care (LTC)—and public health measures in response to the growing drug toxicity crisis within the context of Canada's aging population.

Methods

NOTE FOR ALL ANALYSES

The term "older adults'" is generally used throughout this report to refer to people aged 55 and older. When specific age groups are referenced, exact ranges are provided.

Setting

We conducted a descriptive cross-sectional study to characterize trends over time in healthcare interactions related to OUD, OAT use, non-fatal hospital-treated opioid toxicities, and opioid toxicity deaths, among older adults in Ontario between January 1, 2013, and December 31, 2025. Our study period differed across indicators based on data availability for specific measures. Among older adults who died of an opioid toxicity between January 1, 2023, and December 31, 2024, we described demographic characteristics, circumstances surrounding death, substances contributing to death, prior health history, and healthcare interactions. Opioid toxicity deaths were defined as acute fatal toxicities that were confirmed (not suspected) to be directly attributable to the consumption of an opioid either alone or in combination with other substances, regardless of how the opioid was obtained (see Appendix A for definitions). We captured all confirmed opioid toxicity deaths regardless of manner (i.e., accident, suicide, other).

We defined "older adults" as people 55 years of age and older because evidence suggests that people who use drugs experience premature aging with noted earlier onset of chronic conditions, multi-morbidity, and complex care needs compared to individuals of similar chronological age.[16-18] Importantly, social and structural factors that disproportionately affect people who use substances including poverty, unstable housing, low-socioeconomic status, stigma, criminalization, barriers to healthcare, and other social determinants of health may further compound accelerated aging.[16] This age threshold also mirrors those set by substance use treatment and support programs catered towards older adults across the province.[25,26]

Data Sources

We obtained all data from ICES, an independent, non-profit research institute whose legal status under Ontario's health information privacy law allows it to collect and analyze health care and demographic data, without consent, for health system evaluation and improvement.

The following main data sources were used for this reporting:

We used the **Registered Persons Database**, a registry of all Ontario residents registered under the publicly funded Ontario Health Insurance Plan (OHIP), to identify the population of older adults residing in Ontario and ascertain demographic characteristics such as age and sex. To identify individuals who died from an opioid toxicity, we used the **Drug and Drug/Alcohol Related Death Database (DDARD)** which contains records from investigations of opioid toxicity deaths completed by the Office of the Chief Coroner and the Ontario Forensic Pathology Service. This dataset contains post-mortem toxicology findings on opioid and non-opioid substances involved in deaths, as well as descriptive characteristics and circumstances surrounding death such as living arrangement of decedents, the location of the opioid toxicity incident, manner of death, and whether a bystander was present and able to intervene.

We ascertained opioid, benzodiazepine, and stimulant prescriptions dispensed using data from the **Narcotics Monitoring System**, which captures all controlled substances dispensed from community pharmacies in Ontario, regardless of payer. To identify people residing in LTC settings in Ontario and their medication dispensing patterns, we used the **Ontario Drug Benefit (ODB) Claims** database which captures all claims for prescription medications reimbursed by the public drug program in Ontario, for which qualifying beneficiaries include people living in a LTC facility in Ontario.

For information on visits for outpatient care, we used the **OHIP Claims Database** and the **Community Health Centre database**. To capture ED visits, acute hospital admissions, and mental health-related hospital admissions, we used the **Canadian Institute for Health Information's National Ambulatory Care Reporting System**, **the Discharge Abstract Database**, and **the Ontario Mental Health Reporting System**, respectively**.**

We leveraged several other databases to ascertain additional information about health history, diagnosed conditions, pain conditions/injuries, and clinical comorbidities including but not limited to: the Same Day Surgery Database, the Home Care Database, the Ontario HIV Database, the Ontario Hypertension Database, the Ontario Trauma Registry, the Ontario Dementia Database, and the Ontario Diabetes Database, as well as ICES derived cohorts for Congestive Heart Failure (CHF) and Chronic Obstructive Pulmonary Disease (COPD) (see Appendix B for list of datasets used across study measures).

These datasets were linked using unique encoded identifiers and analyzed at ICES. In accordance with ICES' privacy and confidentiality policy, we suppressed non-zero small cells (N<6) and provided ranges as needed to prevent residual disclosure of small cells. The use of data in this project was authorized under section 45 of Ontario's Personal Health Information Protection Act, which does not require review by a Research Ethics Board.

Calendar quarters (1–4) are categorized as the following:

Study Measures

Trends over time in healthcare interactions related to OUD, OAT use, and opioid toxicity harms

We reported quarterly trends over time across measures of healthcare interactions related to OUD, OAT use, hospital-treated non-fatal opioid toxicities, and opioid toxicity deaths among older adults in Ontario, overall, and among several key stratifications (defined below). We also reported sex stratifications across all measures in the 2024 calendar year (January 1 to December 31, 2024), as this was the most recent calendar year where complete data was available for all measures which allowed for comparisons. For OUD, age was assigned at the end of the relevant time period (i.e., quarter, year) for which OUD criteria (defined below) were assessed. For all other measures, age was defined on the date the event occurred (i.e., first dispensing date for OAT use, admission date for hospital-treated toxicities, and death date for fatal toxicities) in the time period of interest. Population denominators were defined with reference to the first day of each quarter or midpoint of the year (as applicable). Detailed descriptions of each measure are provided below.

Healthcare interactions related to OUD

- **Numerator:** Number of people aged 55+ with a healthcare interaction related to OUD. Defined based on any OUD hospital-based diagnosis, OAT dispensing, or OAT-related outpatient claim in the past 5 years (Appendix B, Table B1).
- **Denominator:** Ontario residents aged 55+
- **Time Frame:** Calendar quarters (2017 - 2025)
- **Stratifications:**
  - Age (55 to 64, 65 to 74, 75+ years) — quarterly
  - Residence within LTC — quarterly
  - Sex (female, male) — 2024 calendar year

Note:

Among people identified with OUD in each quarter, we examined residence within LTC by looking for any drug dispensing claims for publicly-funded medications from a LTC setting within the same quarter, using the ODB dataset.

Hospital-treated non-fatal opioid toxicity

- **Numerator:** Number of non-fatal opioid toxicities treated in an ED or an inpatient hospital setting for people aged 55+ (Appendix B, Table B2).
- **Denominator:** Ontario residents aged 55+
- **Time Frame:** Calendar quarters (2013 - 2025)
- **Stratifications:**
  - Age (55 to 64, 65+ years) — quarterly
  - Sex (female, male) — 2024 calendar year

Note:

This data captured opioid toxicities treated during ED visits and hospital admissions excluding events that resulted in death. It does not capture data from toxicities that were treated outside of a hospital (e.g., in nursing stations, or by paramedics or bystanders). Toxicity incidents included here could have come from any source of opioids (i.e., both prescribed and non-prescribed opioids).

People who were dispensed OAT

- **Numerator:** Number of people aged 55+ who filled a prescription for OAT (i.e., methadone, buprenorphine-containing products and/or slow-release oral morphine (SROM)).
- **Denominator:** Ontario residents aged 55+
- **Time Frame:** Calendar quarters (2013 - 2025)
- **Stratifications:**
  - Age (55 to 64, 65+ years) — quarterly
  - OAT type (methadone, buprenorphine, SROM) — quarterly
  - Sex (female, male) — 2024 calendar year

People who died of an opioid toxicity

- **Numerator:** Number of people aged 55+ who died from an opioid toxicity.
- **Denominator:** Ontario residents aged 55+
- **Time Frame:** Calendar quarters (2013 - 2024)
- **Stratifications:**
  - Age (55 to 64, 65+ years) — quarterly
  - Sex (female, male) — 2024 calendar year
- **Other indicator:** Percent of opioid toxicity deaths directly involving unregulated fentanyl (includes analogues)*

Note:

Opioid toxicity deaths could have resulted from opioids of any origin—pharmaceutical opioids (i.e., regulated prescription-grade) and/or non-pharmaceutical opioids (i.e., illicitly manufactured/unregulated)—regardless of how the opioid was obtained. We used all confirmed opioid toxicity deaths recorded in the coroner's data when reporting on overall trends over time.

*Deaths directly involving unregulated fentanyl excludes individuals dispensed prescribed fentanyl in the 90 days before death. This exclusion was made to help isolate deaths that are primarily associated with non-prescribed/unregulated fentanyl sources. However, it should be noted that a fentanyl dispensing record does not establish that fentanyl involved in death came from a prescribed source.

Demographic characteristics, surrounding circumstances, clinical comorbidities and healthcare interactions among people who died of an opioid toxicity

We linked coroner's records of people aged 55 and older who died of an opioid toxicity between January 1, 2023, and December 31, 2024, to the data repository at ICES, excluding individuals for whom linkage was not possible due to invalid or missing patient identifiers.

We reported on demographic characteristics including age (median and interquartile range [IQR]), age group (55 to 64, 65 to 74, ≥75 years), sex (female, male), and location of residence (urban, rural). We described circumstances surrounding deaths as recorded by the investigating coroner including the living arrangement of the decedents, manner of the fatal toxicity (accidental, death by suicide, undetermined), location of the toxicity incident, and whether a bystander was present and able to intervene at the time of the incident as well as whether naloxone was administered and resuscitation was attempted in these instances. Using the post-mortem toxicology findings, we reported on the origin of opioids (pharmaceutical only, non-pharmaceutical, and both), the specific types of opioids, other non-opioid substances (i.e., alcohol, stimulants, and benzodiazepines), and number of substance classes (1, 2, 3+) (i.e., opioid alone, combined with stimulant, benzodiazepine, and/or alcohol) directly contributing to death. Subsequently, we reported on benzodiazepines detected in toxicity findings (regardless of whether it was a direct contributor to the opioid toxicity death or not). See Appendix A for definitions.

We examined recent dispensing of related substance(s) (prescription opioids, stimulants, and benzodiazepines) in the 90 days before death. We also reported on healthcare interactions related to OUD (in the 5 years prior to death; see definition in Appendix B, Table B1) and OAT (i.e., methadone, buprenorphine containing products, and/or SROM) use among people with OUD in various lookback periods to understand engagement with treatment over time (prior 30 days, 90 days, and 1 year). To characterize how people recently interacted with the healthcare system in the 7 days prior to and including the date of the death, we report on all-cause outpatient and hospital visits, as well as hospital-treated non-fatal opioid toxicities (see Appendix B, Table B3). Among people with all-cause hospital visits in the 7 days before death, we reported the prevalence of leaving the hospital before medically advised (BMA) (i.e., referring to instances where patients left the hospital before discharge was recommended by a healthcare professional). We also reported on the prevalence of healthcare encounters (i.e., outpatient and hospital visits) with a mental health diagnosis in the 5 years prior to death (see Appendix B, Table B4). To examine the health history of people who died of an opioid toxicity we reported on: diagnosed conditions (dementia, human immunodeficiency virus (HIV), diabetes, CHF, hypertension, COPD, Hepatitis C), pain-related injuries and conditions in the ten years prior to death (major traumatic injury, traumatic, anoxic, and hypoxic brain injury) and in the 5 years prior to death (low back pain, fractures/dislocations/strains/sprains, arthritis and related conditions, bone and spinal conditions; unspecified musculoskeletal disorders or congenital abnormalities), Johns Hopkins Aggregate Diagnosis Groups (ADGs), prior contact with a pain physician in the past year, and surgery in the past year (see Appendix B, Table B5 and Table B6). Finally, we reported on receipt of palliative care and home care services in the 1 year prior to death (see Appendix B, Tables B5). Information on the criteria, diagnosis, and billing codes used to define the various healthcare encounters and health conditions are summarized in Appendix B.

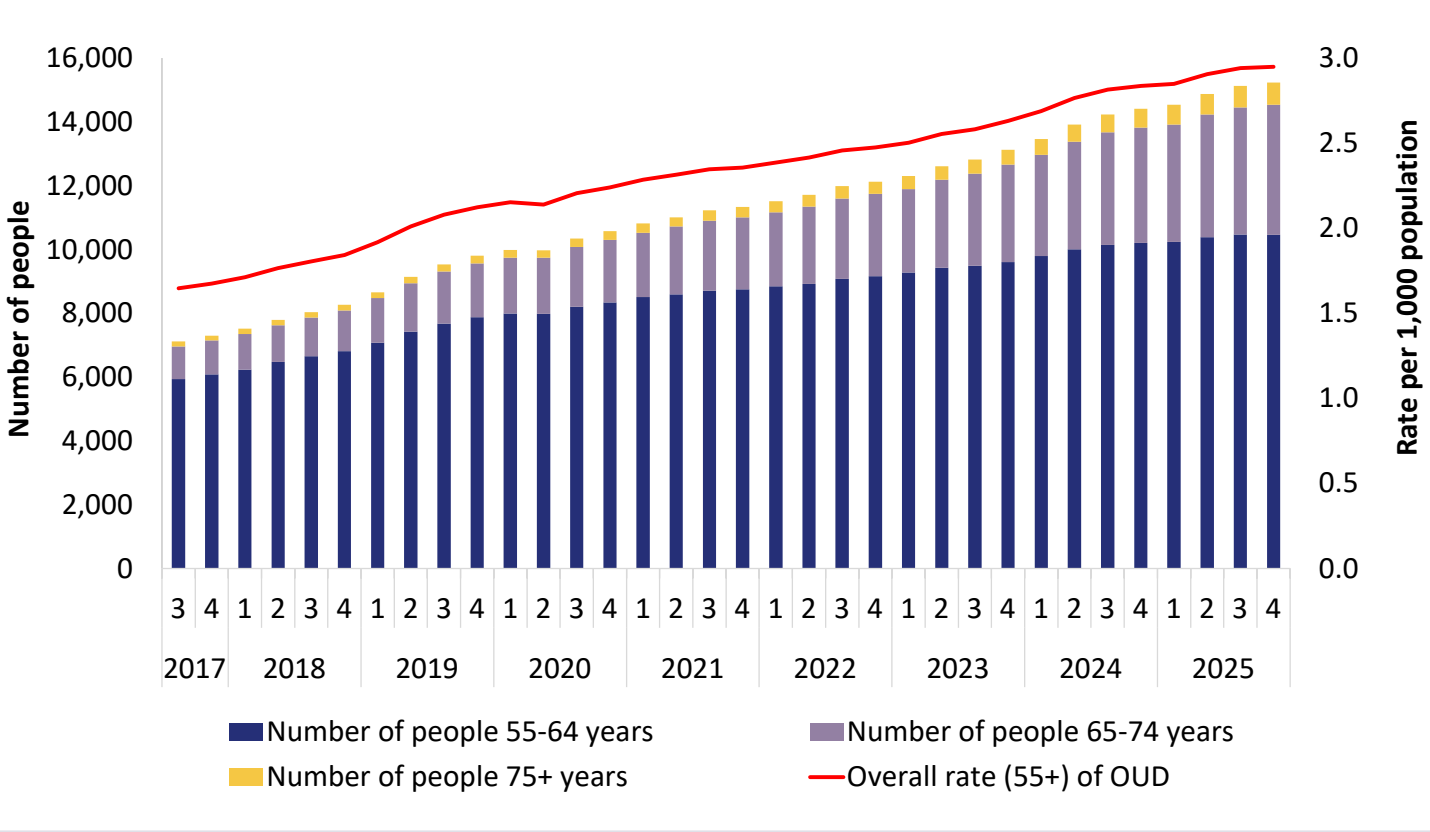
Analysis

We reported quarterly population-adjusted rates over time in healthcare interactions related to OUD, OAT use, and opioid toxicity harms (fatal and non-fatal) in the time periods of interest. Among the cohort of people who died of an opioid toxicity between January 1, 2023, and December 31, 2024, we used descriptive statistics to summarize demographic characteristics, circumstances surrounding death, substance involvement in death, health history, and prior healthcare interactions. Across several of these measures, we compared patterns by age group (55 to 64 vs. ≥65, or 55-64, 65 to 74, ≥75 years, as data allowed).

Key Findings

Trends in Healthcare Interactions Related to OUD and OAT Use

Figure 1: Trends of older adults with healthcare interactions related to OUD*, 2017–2025



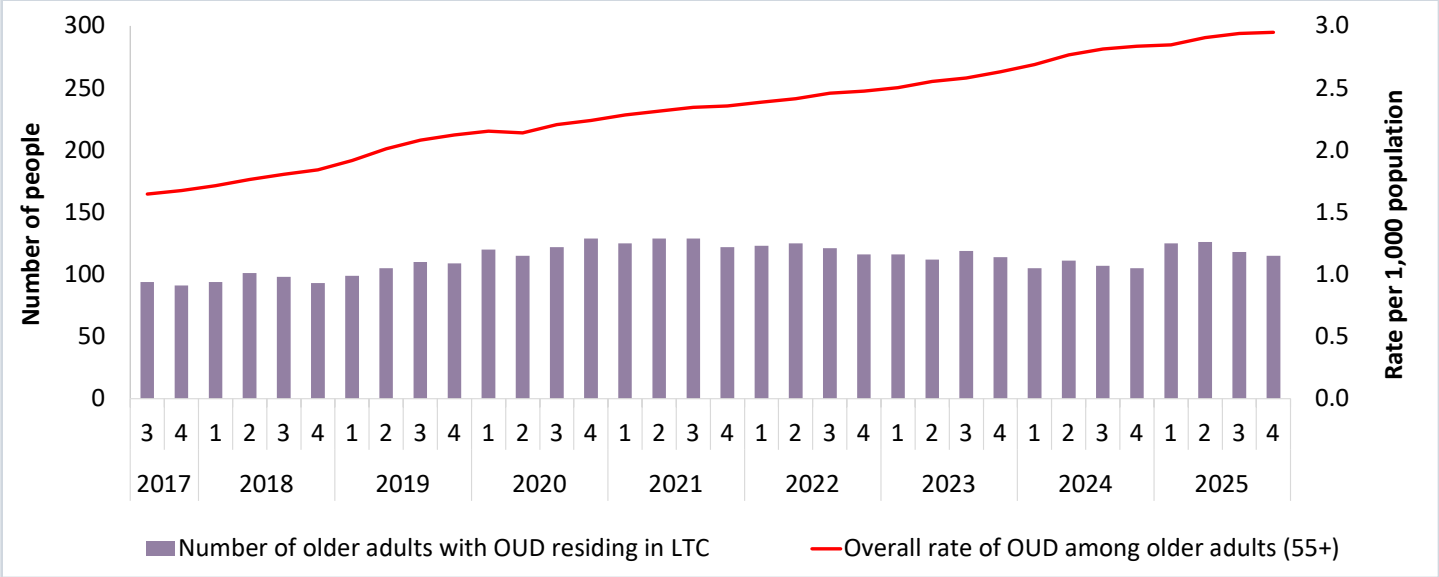
Note

*Defined based on hospital-based diagnosis, OAT dispensing, or OAT-related outpatient visits in the prior 5 years. See Appendix B, Table B1 for definition.

Between Q3 2017 and Q4 2025, the number of older adults who had a healthcare interaction related to OUD more than doubled, from 7,116 to 15,231 people. By the final quarter of 2025, roughly 1 in 350 older adults in Ontario were identified with OUD using healthcare records (a rate of 2.9 per 1,000 population), which is a 81% increase from 1.6 per 1,000 population in Q3 2017.

While the number and rate of OUD was highest among people aged 55-64 over the study period, the largest relative increases in rates were seen among the oldest age groups. Between Q3 2017 and Q4 2025, quarterly rates rose by 65% among those aged 55-64 (3.1 to 5.1 per 1,000; N=5,936 to 10,454), 217% among those aged 65-74 years (0.82 to 2.6 per 1,000; N=1,026 to 4,078), and 221% among those aged 75+ years (0.14 to 0.45 per 1,000; N=154 to 699).

Figure 2: Trends of older adults residing in LTC with OUD-related healthcare interactions, 2017–2025

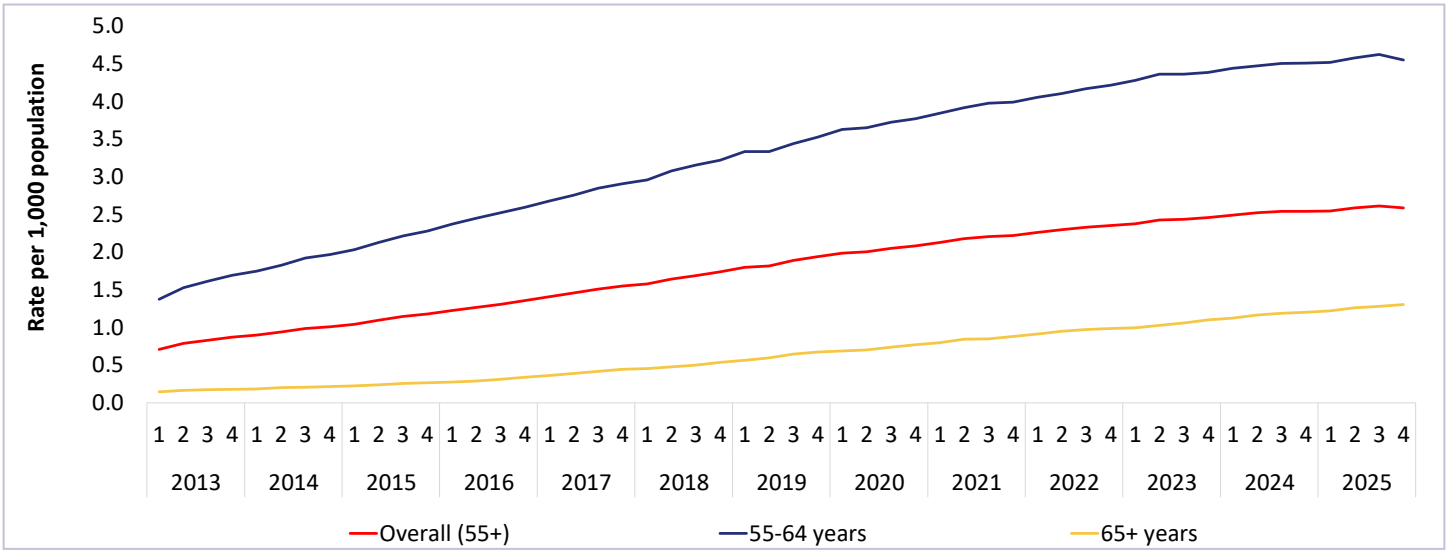


Note

Line graph is the same rate of OUD presented in Figure 1 above.

Despite marked increases in healthcare interactions related to OUD among people 55 and older, the number of persons identified with OUD in this age group who were residing in LTC has remained relatively low and stable between 2017 and 2025 (range, 91 to 129 persons). In the final quarter of 2025, only 115 older adults (aged 55+) with OUD were residing in LTC, a number which has not changed appreciably since Q3 2017 (N=94), despite a doubling of the total number of people identified with OUD in this age group over the same period (N=7,116 to 15,231) and a quadrupling for those aged 75+ (N=154 to 699)—the demographic most likely to be seeking LTC.[27,28]

Figure 3: Rates of older adults receiving OAT, 2013–2025

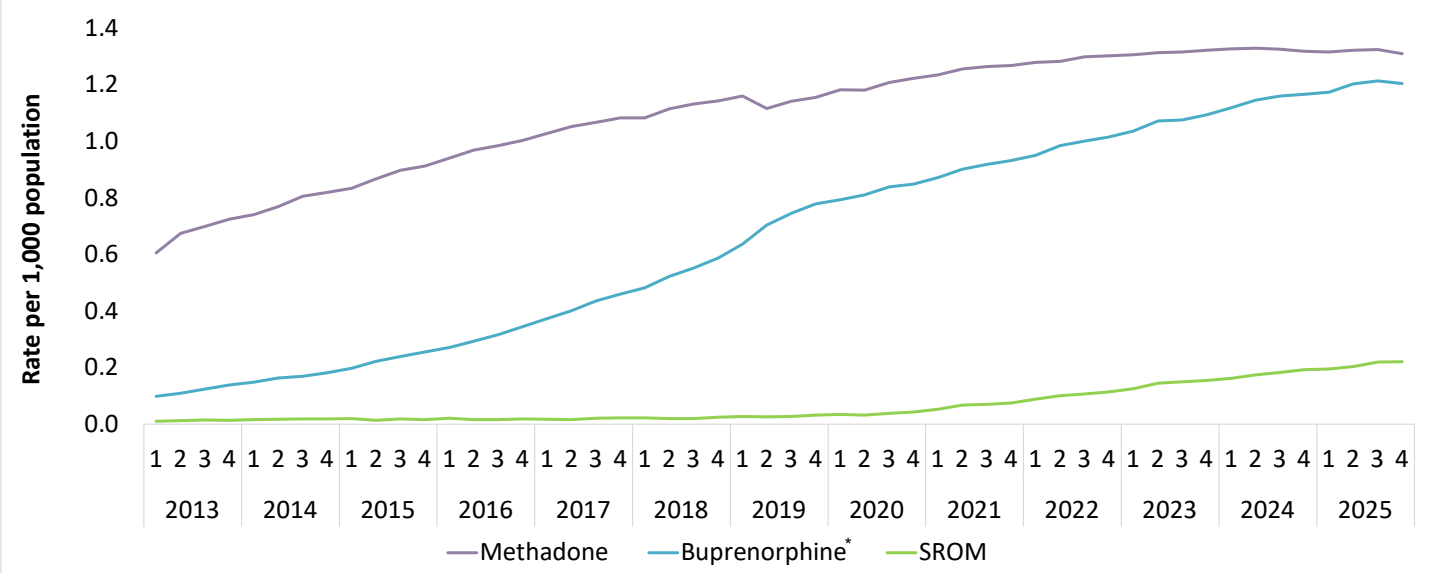


OAT use among older adults in Ontario has steadily increased between Q1 2013 and Q4 2025. In Q1 2013, the rate of older adults dispensed OAT was 0.71 per 1,000 (N=2,661), which more than tripled to 2.6 per 1,000 in the last quarter of 2025 (N=13,370).

The rate of OAT recipients increased among both people aged 55-64 and those aged 65+ over the study period, however rates were highest in the youngest age group. Among people aged 55-64, the rate of people dispensed OAT tripled, rising from 1.4 per 1,000 (N=2,364) to 4.6 per 1,000 (N=9,294) between Q1 2013 and Q4 2025. Among people aged 65+, the number of OAT recipients increased more than 8-fold, although rates overall were much lower, increasing from 0.15 per 1,000 [N=297] to 1.3 per 1,000 [N=4,076] between Q1 2013 and Q4 2025. In the last quarter of 2025, the rate of OAT use was more than three times higher among people aged 55-64 years (4.6 per 1,000; N=9,294) compared to those aged 65+ (1.3 per 1,000; N=4,076). Importantly, this rising OAT use observed among older adults mirrors broader OAT patterns reported provincially, where notable growth was seen in earlier years of the study period.[8] However, since 2021, provincial trends have shown notable declines in OAT use in younger age groups (<45 years), even as OAT use has continued to grow in older age groups.[8]

Notably, over 85% of older adults (55+) identified with OUD within each quarter from Q3 2017 through Q4 2025 (from Figure 1 above) were dispensed OAT (data not shown).

Figure 4: Quarterly rates of older adults receiving OAT, by product type dispensed, 2013–2025



Note

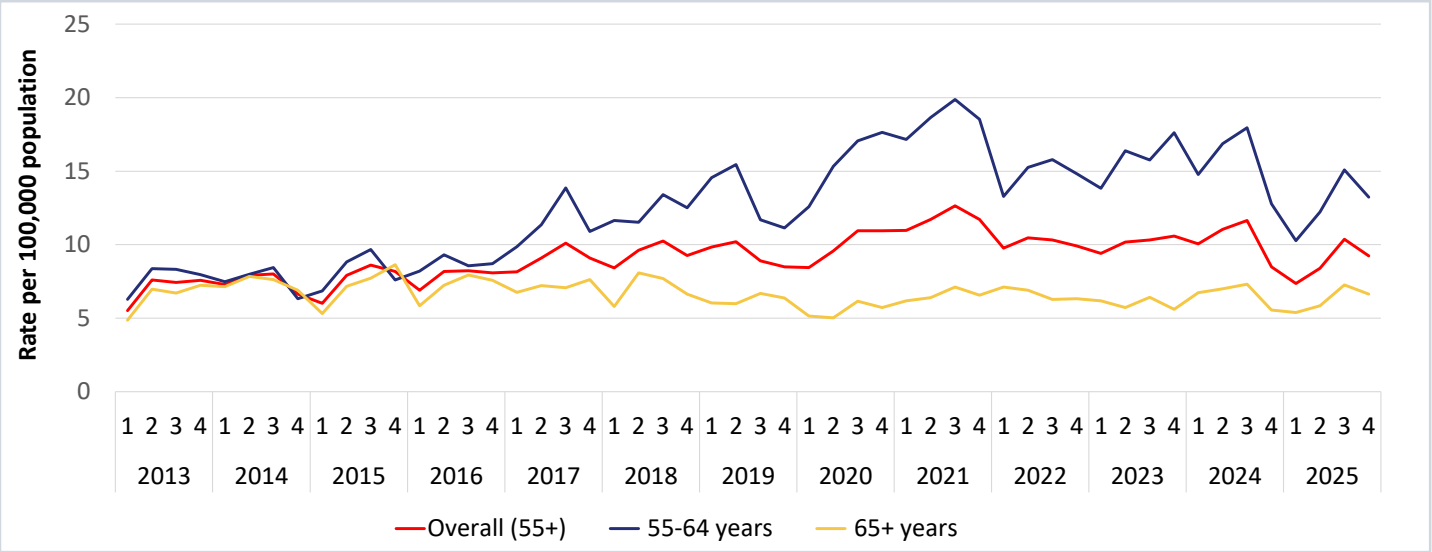
- *Buprenorphine captures all buprenorphine containing OAT products, including buprenorphine/naloxone (Suboxone®), buprenorphine injection (Sublocade®), and buprenorphine implant (Probuphine®).

In Q1 2013, methadone was the most commonly dispensed OAT product among older adults in Ontario, with a dispensing rate of 0.61 per 1,000 population (N=2,273) compared to 0.10 per 1,000 for buprenorphine (N=370), and a negligible rate for SROM (0.01 per 1,000; N=39). Over the next decade, methadone use rose gradually and remained the most commonly used OAT product (1.3 per 1,000; N=6,765) in Q4 2025. At the same time, there was a steep incline in the rate of older adults dispensed buprenorphine-containing products until its use closely followed that of methadone by the end of 2025 (1.2 per 1,000; N=6,220). SROM use has slowly grown since 2021 but remained the least commonly used OAT product (0.22 per 1,000; N=1,141 recipients) in Q4 2O25.

In 2020, an injectable form of buprenorphine, Sublocade®, was approved by Health Canada and became available on the Canadian market. Since then, its use among older adults has grown from less than 5 recipients in Q1 2020 to over 500 recipients by Q4 2025 (N=574).

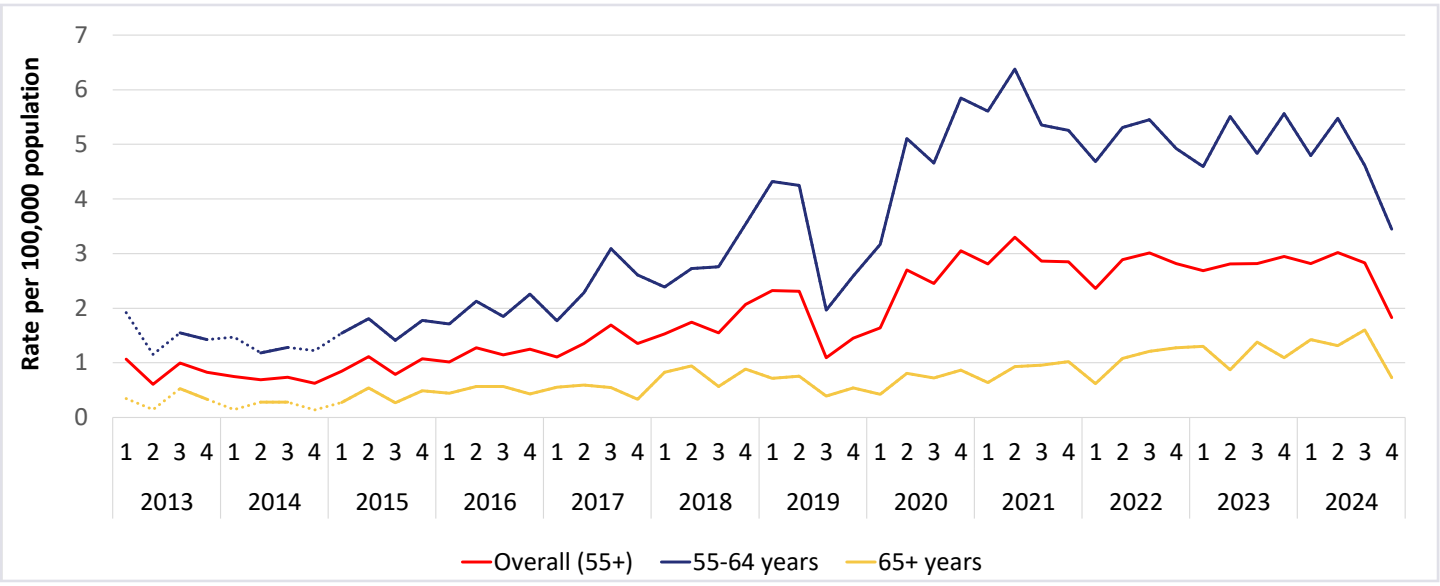
Trends in Non-Fatal and Fatal Opioid Toxicities

Figure 5: Rates of hospital-treated non-fatal opioid toxicities among older adults, 2013–2025



Between Q1 2013 and Q4 2025, the number of non-fatal toxicities treated in emergency departments (EDs) or hospitals more than doubled, from 207 events (5.5 per 100,000) to 477 events (9.2 per 100,000), peaking around the time of the COVID-19 pandemic (605 events in Q3 2021; 12.6 per 100,000)—similar to broader patterns reported provincially.[9] The highest burden was concentrated among the youngest age group (55-64 years), where quarterly rates doubled from 6.3 to 13.2 per 100,000 (N=108 to 270) over the study period. At the same time, among people aged 65 and older, rates only slightly increased (from 4.9 to 6.6 per 100,000), although the absolute number of hospital-treated toxicities more than doubled (from 99 to 207 events).

Figure 6: Rates of opioid toxicity deaths among older adults, 2013–2024

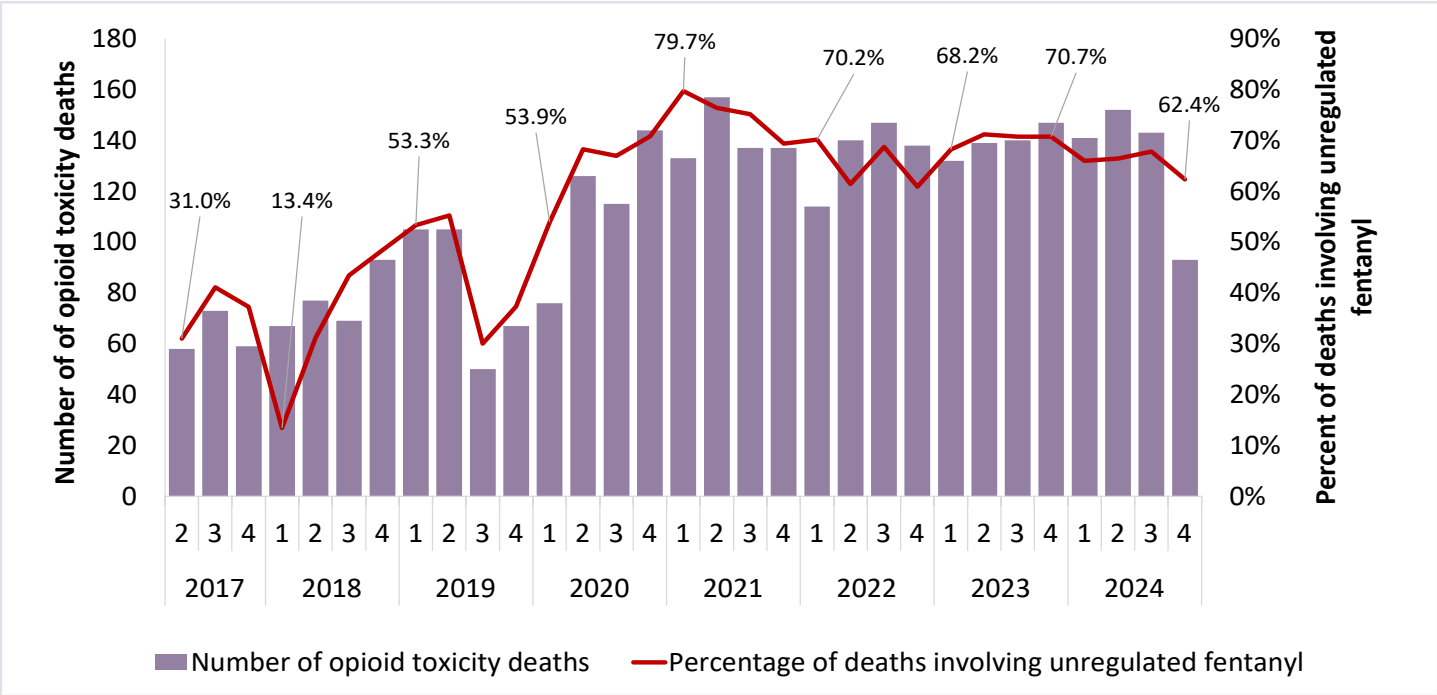


Note

- Dotted lines indicate cell suppression to preserve anonymity (i.e., counts <6).

The quarterly number and rate of opioid toxicity deaths among older adults increased from 1.1 per 100,000 population (N=40 deaths) in Q1 2013 to 1.8 per 100,000 (N=93 deaths) in Q4 2024, with the death rate peaking over the pandemic period (3.3 per 100,000; N=157 deaths in Q2 2021), mirroring broader trends reported provincially.[9] The quarterly rates of opioid toxicity deaths increased by 84% among people aged 55-64 (N=33 to 71; 1.9 to 3.5 per 100,000) and 115% among those aged 65+ years (N=7 to 22; 0.34 to 0.73 per 100,000). Whereas rates of opioid toxicity deaths peaked over the COVID-19 pandemic (Q2 2021) for those aged 55-64 years and subsequently plateaued, they continued to rise steadily among those aged 65+, peaking more recently in Q3 2024 (1.6 per 100,000; N=48), before declining in Q4 2024—consistent with declines also seen in the 55-64 age group and provincially[9] at the time.

Figure 7: Percentage of opioid toxicity deaths directly attributable to unregulated fentanyl*, 2017–2024



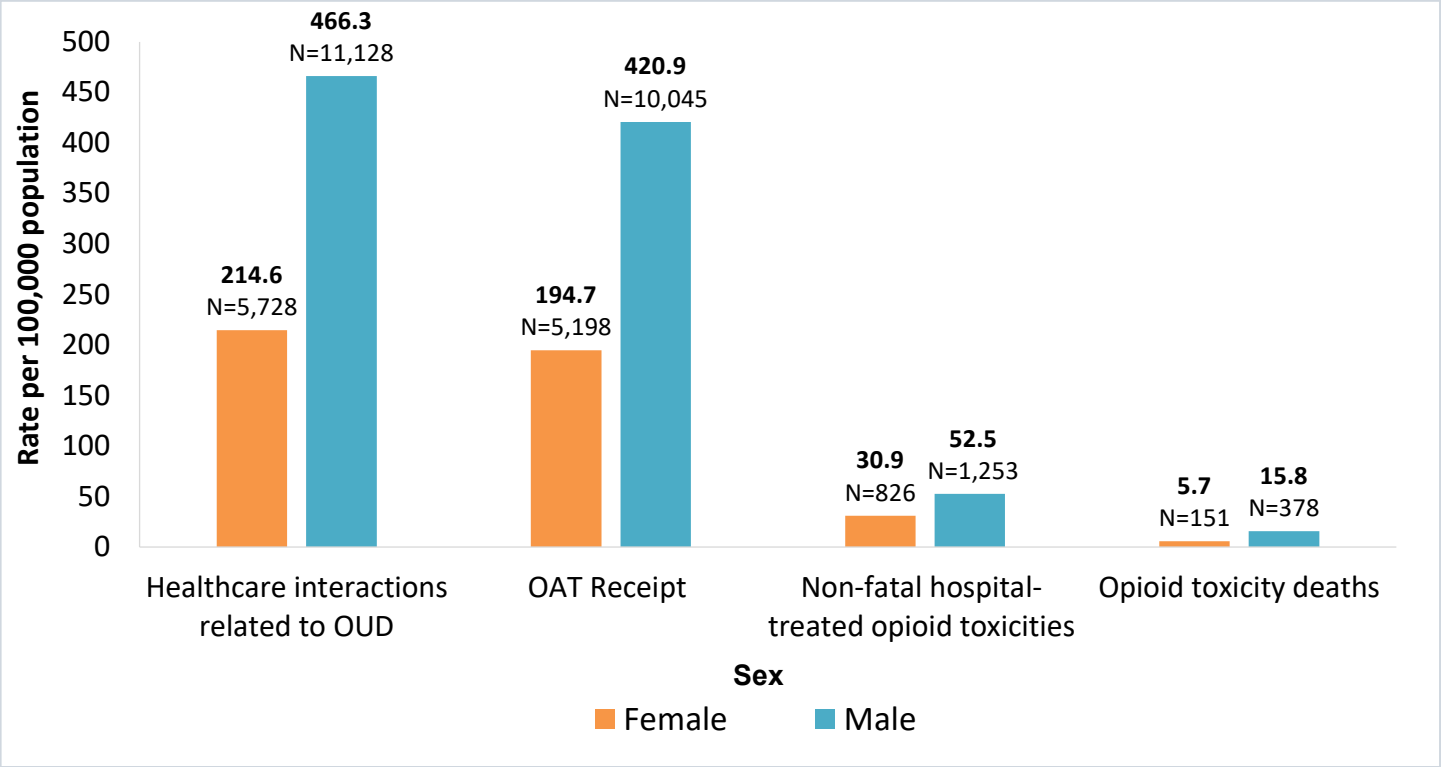
Note

- Shorter study period reflects availability of fentanyl data in post-mortem toxicology results.
- *Excludes individuals dispensed prescribed fentanyl in the 90 days before death. This exclusion accounted for 2.5% of all deaths reported to have directly involved fentanyl in this age group in the coroners' data.

The role of unregulated fentanyl as a direct contributor to opioid toxicity deaths among older adults increased over the study period, consistent with the broader upward trend also seen provincially.[9] In the last quarter of 2024, approximately two-thirds of opioid toxicity deaths (62.4%) involved fentanyl, which has doubled from 31.0% in Q2 2017. Notably, the proportion of opioid toxicity deaths involving unregulated fentanyl peaked over the COVID-19 pandemic period, at 80% of deaths in Q1 2021, before declining slightly and stabilizing at approximately two-thirds of opioid toxicity deaths throughout the remainder of the study period. Fentanyl involvement in death in this age group remains below the provincial rate, where about 80% of opioid toxicity deaths were reported to have involved fentanyl (including analogues) in 2024.[9,29]

Sex-Specific Rates across Indicators

Figure 8: Rates of OUD, OAT receipt, non-fatal hospital-treated toxicities, and opioid toxicity deaths among older adults in 2024, by sex



In 2024, older adults who were males experienced higher rates of OUD, OAT use, non-fatal hospital-treated toxicities, and opioid toxicity deaths compared to females. Specifically, annual rates of OUD and OAT receipt were more than 2 times higher among males than females. Similarly, rates of non-fatal hospital treated opioid toxicities were nearly double among males (52.5 versus 30.9 per 100,000), and opioid toxicity death rates were close to 3-fold higher among males (15.8 vs 5.7 per 100,000) compared to females.

We focused the remainder of our analyses on opioid toxicity deaths among older adults that occurred between:

January 1, 2023 - December 31, 2024

1,087

people aged 55+ died of an opioid toxicity

985 (90.6%)

of those people had linkable healthcare data*

* Those who could be linked to healthcare utilization data (i.e. those with valid health card information)

Demographic Characteristics

Table 1: Characteristics of older adults who died of an opioid toxicity, 2023–2024

Characteristics	Opioid toxicity deaths (N=985)
Age, median (IQR)	61 (57-65)
Age group (N, %)	
55-64	719 (73.0%)
65-74	239 (24.3%)
75+	27 (2.7%)
Sex (N, %)	
Female	265 (26.9%)
Male	720 (73.1%)
Location of Residence (N, %)	
Urban	889 (90.3%)
Rural	66 (6.7%)
Unknown	30 (3.0%)

Nearly three-quarters of deaths were among people aged 55-64 years (73.0%, N=719), compared to 24.3% (N=239) among those aged 65-74 years, and 2.7% (N=27) among those aged 75 and older. Males comprised almost three-quarters (73.1%) of all deaths. The majority of older adults who died of an opioid toxicity were residing in urban locations (90.3%), a finding that largely aligns with the population distribution in the province (87.5% residing in urban areas).[30]

Circumstances Surrounding Deaths

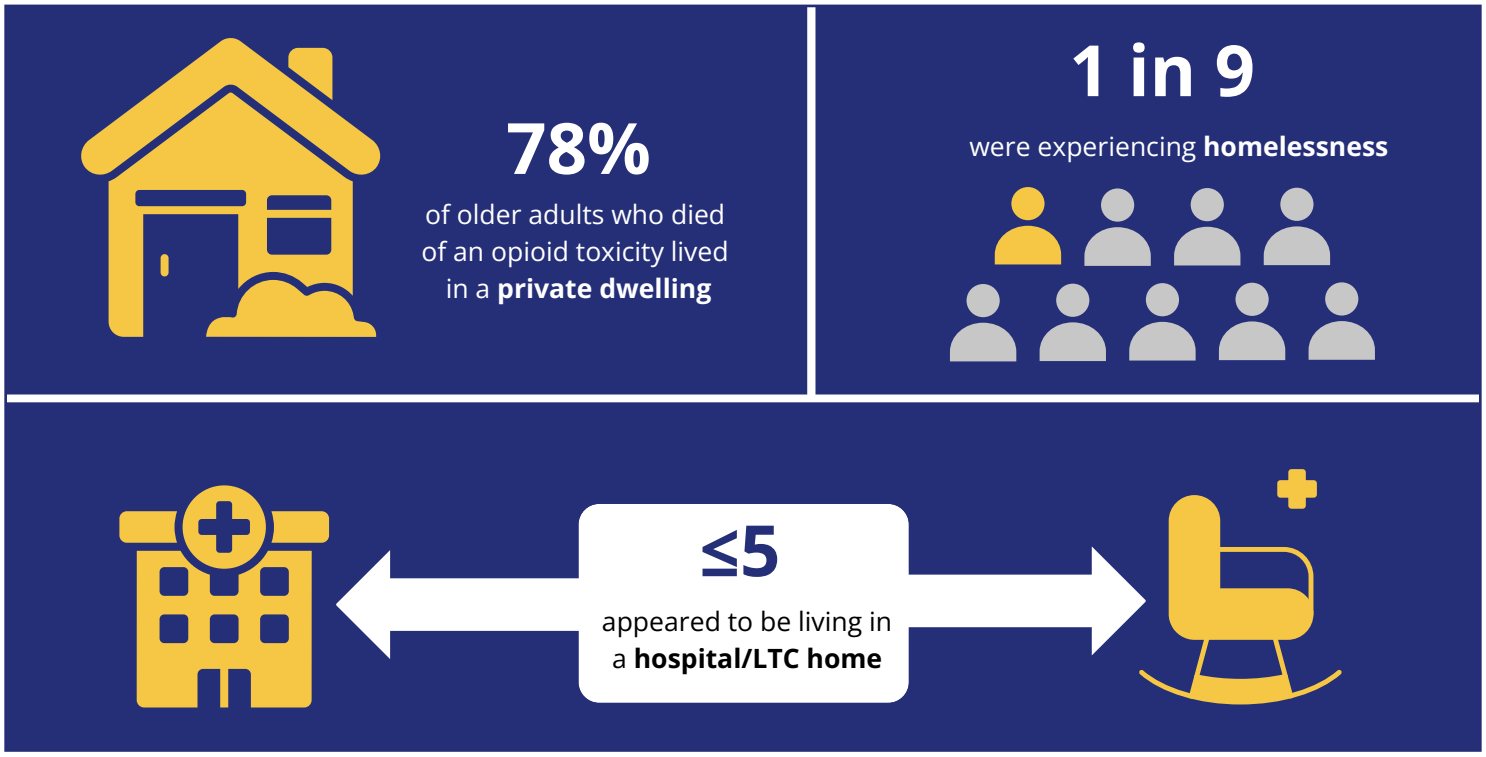
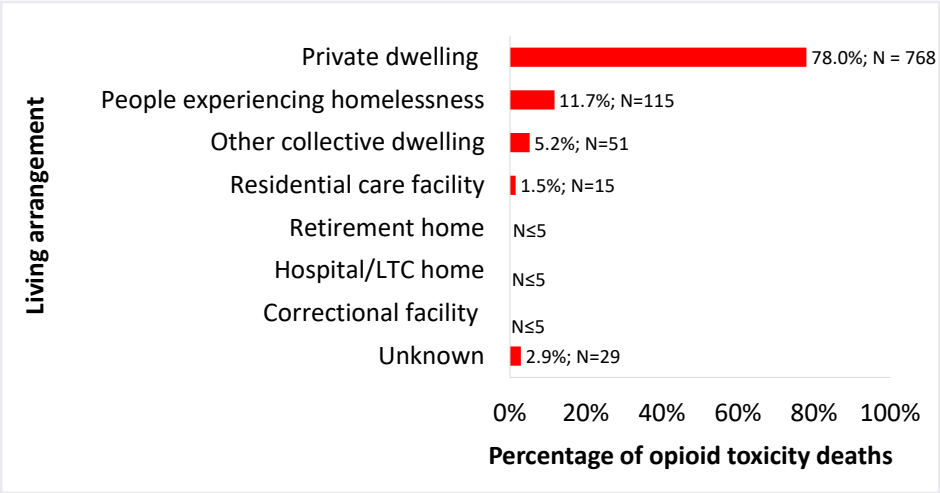


Figure 9: Living arrangement distribution of opioid toxicity deaths among older adults, 2023–2024

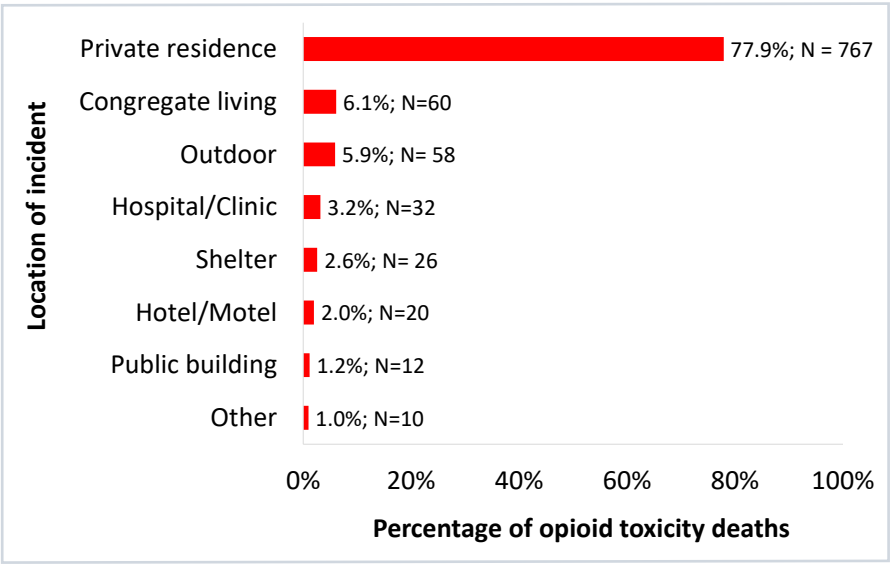


The vast majority (78.0%, N=768) of older adults who died of an opioid toxicity were living in a private residence at the time of death, approximately 1 in 9 people who died were experiencing homelessness (11.7%; N=115), 5.2% were living in other collective dwellings (N=51), and 1.5% were living in a residential care facility (N=15). Very few opioid toxicity deaths (less than 6) occurred among people residing in each of the following locations: retirement homes, hospital/LTC home, and correctional facilities, respectively.

Note

- See Appendix A for definitions.

Figure 10: Location of fatal opioid toxicity incident† among older adults, 2023–2024



A majority (77.9%) of opioid toxicity incidents among older adults occurred within a private residence, a finding which is consistent with the primary living arrangement of most decedents, and similar to what has been reported provincially.[29] Further, 6.1% of opioid toxicity incidents occurred in congregate living settings (N=60). Other less common locations of toxicity incidents included outdoor (5.9%), hospital/clinic (3.2%), shelter (2.6%), hotel/motel (2.0%) and public building (1.2%) settings.

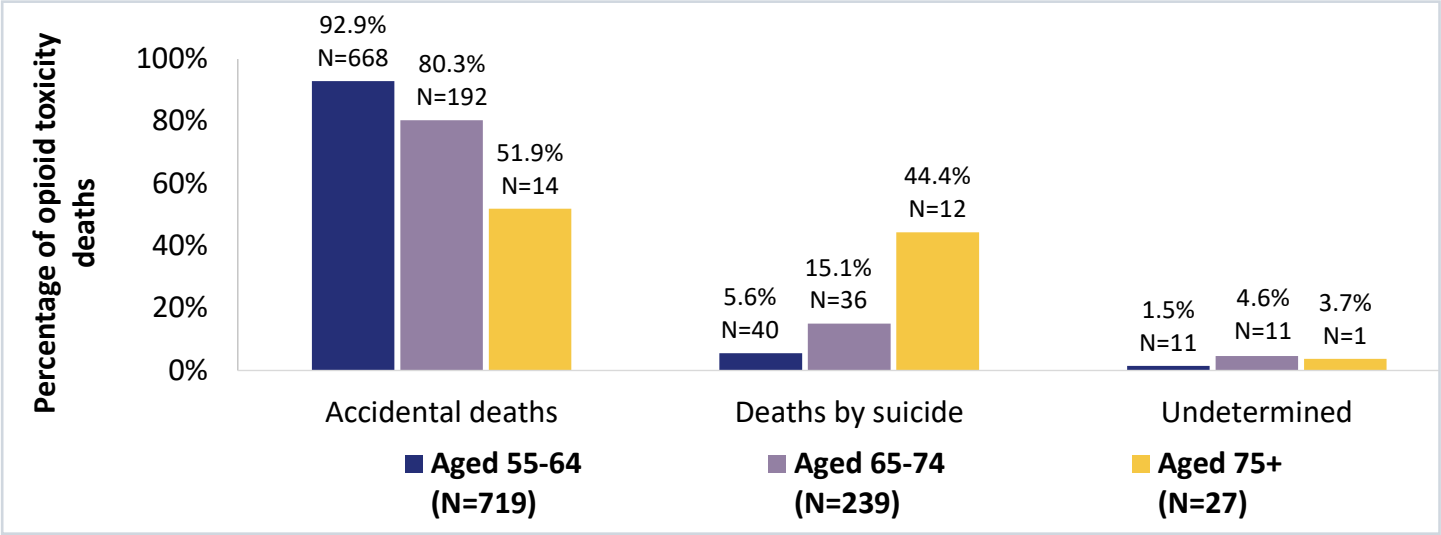
Note

- †Captures location of opioid toxicity (i.e., overdose) incident that resulted in death, regardless of where death ultimately occurred.
- See Appendix A for definitions.

OVERALL MANNER OF DEATH

Accidental deaths	Deaths by suicide	Undetermined
89%	9%	2%

Figure 11: Manner of opioid toxicity death among older adults by age group, 2023–2024



Overall, the vast majority of all opioid toxicity deaths among older adults (55+) were accidental in nature (88.7%; N=874), with 1 in 11 (8.9%; N=88) being deaths by suicide, and 2.3% of an undetermined manner (N=23). Accidental deaths were more common in the younger age groups, accounting for over 90% of deaths among people aged 55-64 and over 80% of deaths among those aged 65-74, compared to only about half of deaths (51.9%) among people aged 75+. In contrast, over 40% of opioid toxicity deaths among those aged 75+ were classified as a death by suicide.

Someone was present and able to intervene* at the time of the toxicity incident among 22.8% of all opioid toxicity deaths

24.1%	20.7%	0.0%
of deaths among those aged **55-64**	of deaths among those aged **65-74**	of deaths among those aged **75+**

*Information on whether an individual was present was not available for approximately one-third of all opioid toxicity deaths. Denominators for percentages differ overall and across age groups. Interpretation may be limited due to the high proportion of unknown cases.

Where information was known (N=482 deaths), the coroner determined that someone was present and in a position to intervene in 1 in 5 opioid toxicity deaths (22.8%; N=110). This was similar among those aged 55-64 (24.1% of deaths; N=85) and those aged 65-74 (20.7% of deaths; N=25), where information was known. In contrast, no one was present to intervene in toxicities among people aged 75+ where this information could be determined by the coroner (0.0%; N=0); although there was a high degree of unknown information in this age group (N=18 where unknown if someone present). Importantly, among deaths where someone was present and able to intervene (N=110), 64.5% (N=71) led to a resuscitation attempt and 46.4% (N=51) had naloxone administered (data not shown).

Substance Involvement in toxicity deaths

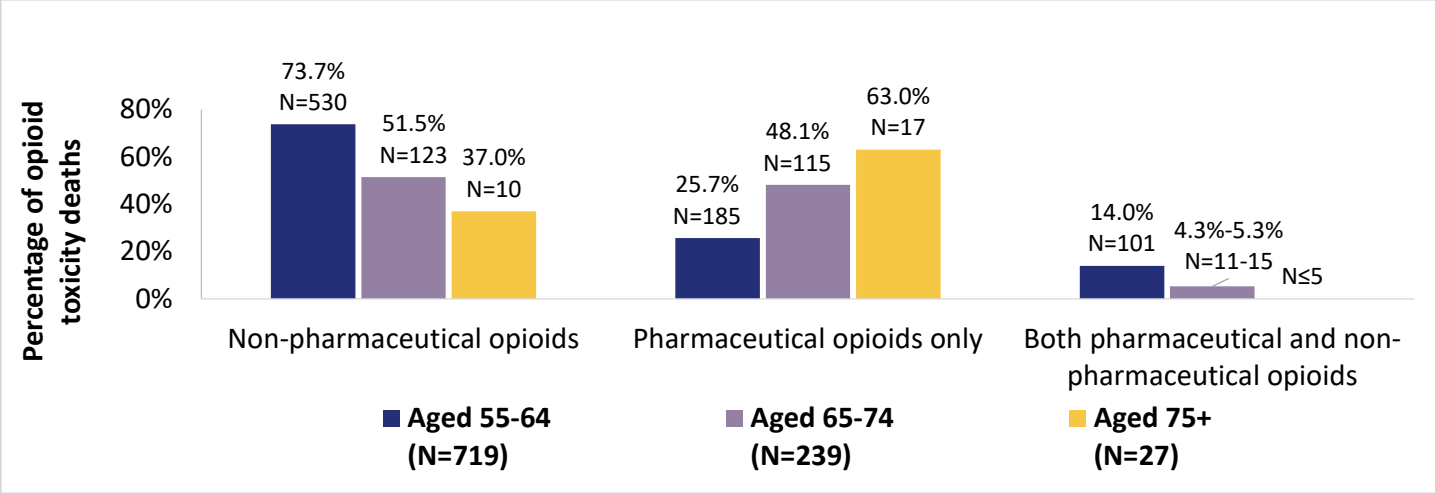
Origin of opioids directly contributing to death

32.2% involved **only pharmaceutical opioids** (317 deaths)

11.9% involved **both pharmaceutical and non-pharmaceutical opioids** (117 deaths)

67.3% involved **non-pharmaceutical opioids** (663 deaths)

Figure 12: Origin of opioids directly contributing to death among older adults by age group, 2023–2024



Note

- See **Appendix A** for complete definitions.
- "Pharmaceutical opioids only" captures deaths directly attributed to pharmaceutical opioid sources without involvement of non-pharmaceutical opioid sources.
- "Non-pharmaceutical opioids" captures deaths directly attributable to non-pharmaceutical opioids either alone or in combination with pharmaceutical opioids.
- "Both pharmaceutical and non-pharmaceutical opioids" captures deaths directly attributable to a combination of pharmaceutical and non-pharmaceutical opioids.

Overall, two-thirds of opioid toxicity deaths among older adults involved non-pharmaceutical opioids (either alone or combined with pharmaceutical opioids) (N=663; 67.3%). Approximately 1 in 3 deaths involved pharmaceutical opioids only (without combined involvement of non-pharmaceutical opioids) (N=317; 32.2%), and 11.9% involved a combination of pharmaceutical and non-pharmaceutical opioid sources (N=117). Among people aged 55-64, non-pharmaceutical opioids were involved in nearly three-quarters (73.7%) of deaths, compared to approximately half (51.5%) of deaths among people aged 65-74, and only 37.0% of deaths among people aged 75+. In contrast, pharmaceutical opioids were the predominant opioid contributing to death among people aged 75+, with almost two-thirds (63.0%) of deaths in this age group found to be directly attributable to pharmaceutical opioids only. Notably, these findings (especially in the 65+ age groups) differ from those reported in the broader provincial population, where in 2024 over 8 in 10 deaths involved fentanyl (and its analogues) and 1 in 4 involved pharmaceutical opioids in the absence of fentanyl.[29]

Table 2: Specific types of opioids directly contributing to death among older adults, 2023–2024

Opioids directly contributing to death	Opioid toxicity deaths (N=985)
Non-pharmaceutical opioids (any)	**663 (67.3%)**
Fentanyl or fentanyl analogues†	660 (67.0%)
Heroin, Nitazene, or U47700	9 (0.9%)
Pharmaceutical opioids (any)	**434 (44.1%)**
Hydromorphone	143 (14.5%)
Oxycodone	93 (9.4%)
Codeine	41 (4.2%)
Morphine	116 (11.8%)
Methadone	142 (14.4%)
Buprenorphine	9 (0.9%)
Tramadol	14 (1.4%)
Pharmaceutical fentanyl	7 (0.7%)
Hydrocodone	1-5 (0.1%-0.5%)

Fentanyl (and its analogues) were the main non-pharmaceutical opioid involved in opioid toxicity deaths among older adults, contributing to two-thirds (67.0%) of all deaths. Various pharmaceutical opioids indicated for pain management or OAT were determined to be direct contributors to deaths, with hydromorphone (14.5%), methadone (14.4%), and morphine (11.8%) most commonly being involved in toxicity deaths.

Note

- Categories are not mutually exclusive. Some deaths were attributed to multi-drug toxicity where more than one substance can contribute to an individual death.
- †Excludes individuals dispensed any prescription fentanyl in the 90 days before death. These cases were re-classified as involving "pharmaceutical fentanyl".

Table 3: Role of non-opioid substances in opioid toxicity deaths among older adults, 2023–2024

	Opioid toxicity deaths (N=985)
Number of substance classes* directly contributing to deaths	
1 (opioids only)	**258 (26.2%)**
2 substance classes	452 (45.9%)
3 or more substance classes	275 (27.9%)
Non-opioids directly contributing to deaths	
Alcohol	100 (10.2%)
Stimulants	590 (59.9%)
Pharmaceutical Stimulants	7 (0.7%)
Non-Pharmaceutical Stimulants	586 (59.5%)
Cocaine	474 (48.1%)
Methamphetamine	249 (25.3%)
Benzodiazepines	340 (34.5%)
Pharmaceutical Benzodiazepines	80 (8.1%)
Non-Pharmaceutical Benzodiazepines	258 (26.2%)
Non-opioids detected in deaths	
Benzodiazepines	601 (61.0%)

Opioid toxicity deaths commonly involved two or more substance classes (73.8%, N=727), with only 1 in 4 deaths (26.2%) involving opioids only without another substance (i.e., at least one of alcohol, benzodiazepines or stimulants) directly contributing to death. Stimulants contributed to over half of opioid toxicity deaths (59.9%, N=590), the vast majority of which involved cocaine (48.1%) or methamphetamines (25.3%). Benzodiazepines directly contributed to one-third of deaths (34.5%, N=340), with the majority involving non-pharmaceutical benzodiazepines (26.2%; N=258). Notably, just over 60% of deaths had benzodiazepines detected in post-mortem toxicity (regardless of whether it was determined to directly contribute to the opioid toxicity death) (61.0%). Finally, alcohol directly contributed to 1 in 10 deaths (10.2%, N=100).

Note

- *Substance classes (1, 2, ≥3) reflect opioids alone or opioids combined with one or more of stimulant, benzodiazepine, and/or alcohol as direct contributors to death.
- Categories are not mutually exclusive. Some deaths were attributed to multi-drug toxicity where more than one substance can contribute to an individual death.

Table 4: Role of non-opioid substances in opioid toxicity deaths among older adults by age group, 2023–2024

	Age group		
	55–64 years (N=719)	65–74 years (N=239)	75+ years (N=27)
Number of substance classes directly involved in deaths			
Opioids only	159 (22.1%)	88 (36.8%)	11 (40.7%)
2+ substances	560 (77.9%)	151 (63.2%)	16 (59.3%)
Non-opioid substances that directly contributed to death			
Stimulants	471 (65.5%)	110 (46.0%)	9 (33.3%)
Benzodiazepines	259 (36.0%)	72 (30.1%)	9 (33.3%)
Alcohol	67 (9.3%)	28-32 (11.7% - 13.4%)	1-5 (3.7%-18.5%)

While the majority of deaths directly involved two or more substance classes across all age groups, deaths among those aged 65-74 and aged 75+ more commonly involved opioids alone without stimulants, benzodiazepines or alcohol (36.8% and 40.7%, respectively) compared to those aged 55-64 years (22.1%). This appeared to be driven by stimulant involvement in death which was most common among those aged 55-64 (65.5%) compared to those aged 65-74 (46.0%) and aged 75+ (33.3%). In contrast, benzodiazepine involvement in death was generally similar across age groups.

Medication Dispensing Patterns Prior to Death

Table 5: Prior receipt of prescription medications among older adults who died of an opioid toxicity, overall and by age group, 2023–2024

Medications dispensed in the prior 90 days	Overall deaths (N=985)	Age group		
		55–64 years (N=719)	65–74 years (N=239)	75+ years (N=27)
Opioid Prescriptions				
Any prescription opioids	496 (50.4%)	350 (48.7%)	134 (56.1%)	12 (44.4%)
Opioids indicated for pain	383 (38.9%)	253 (35.2%)	120 (50.2%)	10 (37.0%)
OAT	169 (17.2%)	142 (19.7%)	22-26 (9.2% - 10.9%)	1-5 (3.7%-18.5%)
Non-opioid prescriptions				
Stimulants	33 (3.4%)	27 (3.8%)	6 (2.5%)	0 (0.0%)
Benzodiazepines	251 (25.5%)	177 (24.6%)	66 (27.6%)	8 (29.6%)

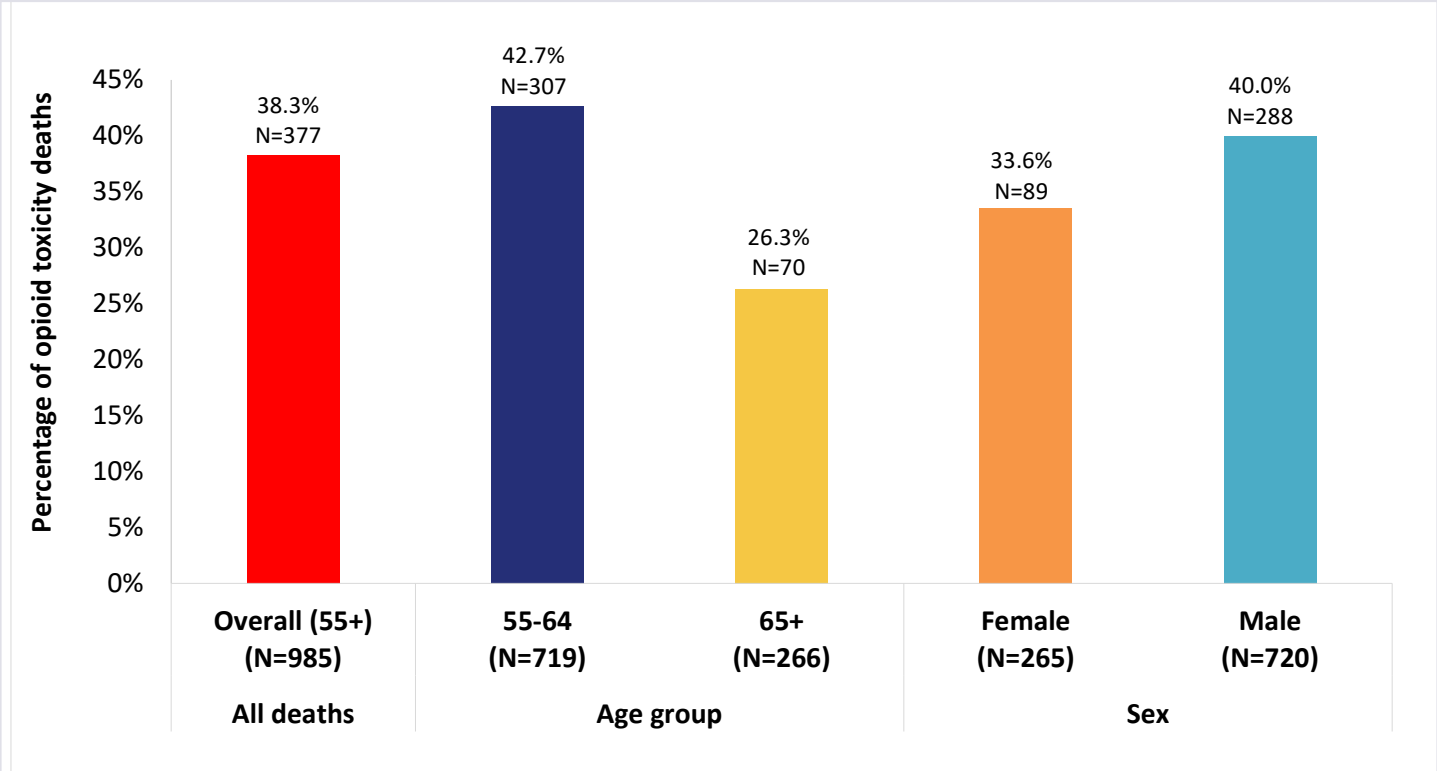
In the 90 days preceding death, half of older adults who died of an opioid toxicity received a prescription opioid (50.4%, N=496), over one-third were dispensed an opioid indicated for pain (38.9%; N=383) and less than one-fifth were dispensed OAT (17.2%, N=169). Prior reciept of stimulants was uncommon (3.4%), whereas one-quarter (25.5%) of older adults had been dispensed a benzodiazepine in the 90 days before death. These patterns were largely consistent across age groups, although people aged 65-74 years were slightly more likely to have received prescription opioids for pain (50.2%) in the past 90 days than those aged 55-64 (35.3%) and 75+ (37.0%).

History of OUD-related healthcare interactions among older adults who died of an opioid toxicity

38% of older adults who died of an opioid toxicity had a healthcare interaction related to OUD in the five years prior to death (N=377)

Using all available historical health records, **49%** (N =483) of older adults who died of an opioid toxicity had at least one healthcare interaction related to OUD at some point prior

Figure 13: Proportion of opioid toxicity deaths where there was evidence of OUD* overall, and across age and sex groups, 2023–2024

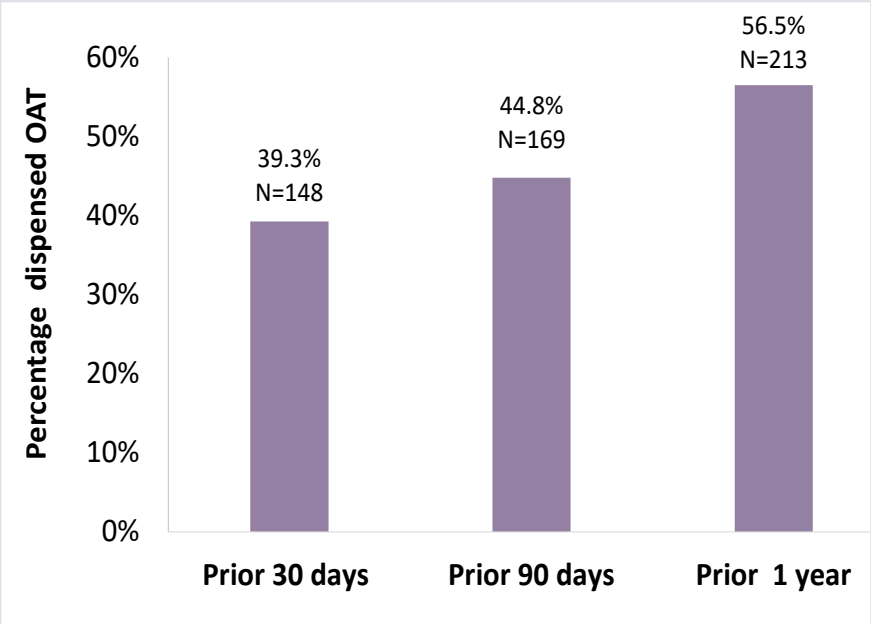


Note

- *Defined based on hospital-based diagnosis, OAT dispensing or OAT related outpatient visits in the prior 5 years. See Appendix B, Table B1 for definitions.

Overall, just over one-third of older adults who died of an opioid toxicity had a healthcare interaction related to OUD in the prior 5 years (N=377; 38.3%). The prevalence of OUD was higher among older adults aged 55-64 (42.7% vs 26.3% among adults aged 65+) and males (40.0% vs. 33.6% among females).

Figure 14: Recent receipt of OAT among older adults with an opioid use disorder (OUD) who died of an opioid toxicity (N=377)



Among people identified with OUD who died of an opioid toxicity (N=377), 39.3% (N=148) were dispensed OAT in the month prior to death. When considering the 90 days and 1-year prior to death, prevalence of OAT receipt grew to 44.8% and 56.5%, respectively.

Table 6: Recent healthcare encounters in the 7 days preceding an opioid toxicity death among older adults, 2023–2024

Healthcare encounters (prior week)	Opioid toxicity deaths (N=985)
Any healthcare encounter†	**270 (27.4%)**
Any outpatient visits	202 (20.5%)
Primary care outpatient visit	96 (9.7%)
ED visit	92 (9.3%)
*Left ED before medically advised**	13 (14.1%)
Acute inpatient hospitalization	24 (2.4%)
*Left hospital before medically advised**	1-5 (4.2%-20.8%)
Mental health hospitalization	6 (0.6%)
Hospital visits for non-fatal opioid toxicity	13 (1.3%)

Among older adults who died of an opioid toxicity, over 1 in 4 (27.4%) had a recent healthcare encounter through outpatient or hospital visits, although the location of these healthcare encounters varied. Specifically, 1 in 5 (20.5%) received outpatient care, 1 in 10 (9.7%) visited a primary care provider, and 1 in 11 (9.3%) had an ED visit in the week prior to death. Just over 1% (N=13) of people were treated in the hospital for a non-fatal opioid toxicity in the week prior to death.

Note

- † Includes outpatient visits (including primary care), ED visits, or hospital admissions unrelated to the fatal toxicity event.
- *Reported as percentage of hospital visits.

Table 7: Health history and diagnosed conditions among older adults who died of an opioid toxicity, 2023–2024

	Opioid toxicity deaths (N=985)
Any health encounter for mental health diagnosis (prior 5 years)	**819 (83.1%)**
ED visit or hospitalization	449 (45.6%)
CHC visit	42 (4.3%)
Other outpatient visit	753 (76.4%)
Mood and anxiety disorders	552 (56.0%)
Substance use disorders	479 (48.6%)
Psychotic disorders	87 (8.8%)
Behavioral and neurodevelopmental disorders	19 (1.9%)
Other mental health-related disorders	228 (23.1%)
Diagnosed Conditions	
Hypertension	445 (45.2%)
Chronic Obstructive Pulmonary Disease (COPD)	250 (25.4%)
Diabetes	171 (17.4%)
Congestive heart failure (CHF)	94 (9.5%)
Hepatitis C treatment in the prior 5 years	93 (9.4%)
HIV	24 (2.4%)
Dementia	21 (2.1%)
Alcohol use disorder diagnosis in the prior 5 years	244 (24.8%)
Comorbidity Score: Johns Hopkins ADGs (prior 2 years)	
0–5	277 (28.1%)
6–9	251 (25.5%)
≥10	457 (46.4%)
Receipt of palliative care in the 1 year prior to death	**67 (6.8%)**
Receipt of home care service in the 1 year prior to death	**249 (25.3%)**

Note

- See Appendix B, Table B5 for definitions.

Over 80% of older adults who died of an opioid toxicity had engaged with the healthcare system for a mental-health related diagnosis in the 5 years prior to death, with these diagnoses being predominately made through outpatient care visits (76.4%). Outpatient diagnoses of mood and anxiety disorder (56.0%) and substance-use disorders (48.6%) were most common.

Older adults who died of an opioid toxicity had a high degree of comorbidities, particularly hypertension (45.2%), COPD (25.4%), alcohol use disorder (24.8%), diabetes (17.4%). Importantly, 1 in 4 older adults had received a home care service in the 1 year prior to death (25.3%) whereas the prevalence of palliative care was relatively low over the same period (6.8%).

Table 8: Pain conditions and injuries among older adults who died of an opioid toxicity, 2023–2024

Pain Conditions & Injuries	Opioid toxicity deaths (N=985)
Major traumatic injury (prior 10 years)†	44 (4.5%)
Traumatic brain injury (TBI) (prior 10 years)	93 (9.4%)
Anoxic or hypoxic brain injury (prior 10 years)	18 (1.8%)
Fractures/dislocations/strains/sprains (prior 5 years)	579 (58.8%)
Arthritis & related conditions (prior 5 years)	535 (54.3%)
Unspecified musculoskeletal disorders or congenital abnormalities (prior 5 years)	522 (53.0%)
Low back pain (prior 5 years)	521 (52.9%)
Bone & spinal conditions (prior 5 years)	446 (45.3%)
Surgery in the past year	82 (8.3%)
Prior contact with a pain physician in the past year	157 (15.9%)

Note

- † Major traumatic injury is defined using an Injury Severity Score (ISS) > 12, which measures the combined severity of injuries across multiple body regions rather than the severity of any single injury.[31]

There was a high prevalence of pain conditions and injuries among older adults who died of an opioid toxicity, most commonly fractures, dislocations, strains, or sprains (58.8%), arthritis and related conditions (54.3%), unspecified musculoskeletal disorders or congenital abnormalities (53.0%), low back pain (52.9%), and bone and spinal conditions (45.3%). Close to 1 in 10 older adults had a traumatic brain injury in the past 10 years and nearly 2% of older adults were treated for hypoxic or anoxic brain injury in the same period.

Limitations

1. We restricted our analyses of coronial records to confirmed opioid toxicity deaths. Therefore, suspected deaths that may later be confirmed to be opioid-related are not included in our study, although we expect that differences in numbers are small. Importantly, given that our population of interest includes senior populations, we anticipate that potential misclassifications of opioid-related toxicity deaths as being of a natural cause may be more likely to occur, which may have resulted in an underestimation of opioid toxicity deaths in the studied age group. Moreover, deaths by suicide may also be misclassified and underreported, as evidence of intent may not always be identifiable or present.
2. Prescribing data is based on records of prescriptions dispensed from pharmacies. We are unable to determine whether people who were dispensed medications took the medication as prescribed.
3. Outside of data from post-mortem toxicology records, we are unable to understand patterns of unregulated drug use and/or transitions between prescribed and non-prescribed opioid environments, which is an important picture in the understanding of opioid toxicity harms in this population.
4. We were unable to capture privately funded home care services or other community-based support that may have been provided to older adults aging at home.

5. In our analysis pertaining to residency within LTC among older adults with OUD, we were unable to determine whether individuals made any attempts to access LTC and/or if they were on LTC waitlists. Moreover, it is important to note that our definition of residency within LTC relies on publicly funded drug dispensing claims for LTC in the prior 90 days. This represents a reasonable proxy, as frequent medication dispensing is expected given complex case management within LTC.
6. We did not have data on acute injuries related to opioid use in this population (e.g., falls, fractures, cardiovascular events etc.) that may be salient in the understanding of the full impact of opioid use in this population.
7. It is important to note there is no validated definition of OUD in administrative health data, thus we relied on healthcare encounters related to OUD, receipt of OAT, and outpatient care visit related to OAT provision in the prior 5 years to define this measure. Importantly, not everyone with an OUD will seek diagnosis and treatment or have OUD diagnosis identified in their health records. Research points to older adults being less likely to be screened, identified, and treated for OUD compared to younger counterparts.[32-36] Some people with OUD may not present in healthcare settings or disclose OUD to health providers. Therefore, it is likely that we have not identified all people with OUD in this age cohort.
8. Finally, our measure of OAT dispensing (including in our definition for OUD) may inadvertently capture use for pain management. However, we made efforts to limit to products with primary indication for OAT (excluding those typically used to treat pain).

Discussion

The findings of this report reinforce rising healthcare interactions for OUD as well as opioid toxicity harms among older adults in Ontario. By the end of 2025, over 15,000 older adults (aged 55+) were living with OUD, and the rate of OAT use in this population more than tripled compared to 2013, reflecting a marked shift in the scale of OUD-related care engagement among older adults over the last decade. In 2023 and 2024 alone, 1,087 older adults died of an opioid toxicity, accounting for about 22% of all opioid toxicity deaths in the province over this period and corresponding to at least one death attributed to opioids each day. Additionally, the proportion of opioid toxicity deaths involving unregulated fentanyl doubled between 2017 and 2024, from 31% to 62%, reflecting the growing reach of the unregulated drug supply in older populations—a finding that demands broader consideration of drivers of harm among older adults beyond the traditional focus on pharmaceutical opioids. Yet, findings were not uniform across older age groups, with meaningful differences observed in the role of pharmaceutical versus unregulated opioids and the circumstances surrounding death, pointing towards the need for nuanced and age-sensitive responses to the growing opioid crisis in the older adult population.

While rising engagements in pharmacological treatments for OUD and opioid toxicity harms are not unique to older adults,[8,9] there are notable differences in trends that warrant attention. OAT use among older adults, while lower than that observed in the broader Ontario population, has grown steadily even as rates have plateaued provincially in recent years and declined among younger populations (aged <45 years).[8] Similarly, while opioid toxicity harms remain highest among people aged 25-64 provincially,[9] harms among those aged 65 and older—where opioid toxicity deaths peaked as recently as Q3 2024—appears to follow a distinct and more sustained trajectory compared to those observed in younger age groups. Together, patterns suggest that older adults represent a growing and increasingly prominent population within the opioid crisis and OUD care—one shaped by greater medical complexity and the intersecting vulnerabilities of aging—that current systems largely designed around younger populations of people living with OUD, may not be equipped to address.

Patterns of OUD and System Readiness for Care

Rising Health Interactions Related to OUD among Older Adults in Ontario

A key finding of this report is rising healthcare interactions related to OUD over time among older populations in Ontario. Between mid-2017 and the end of 2025, the number of people aged 55 and older identified with OUD (i.e., diagnosed with or accessed pharmacological treatment for OUD) in the province doubled, reaching 15,231 people. While the majority of older adults with OUD were aged 55 to 64, we observed growth across all older age groups, notably outpacing aging population trajectories in Ontario over this period.[7] Emerging evidence from the United States has also signaled substance use disorders, and OUD in particular, as fast-growing public health concerns in older age cohorts, with the projected trends expected to intensify in the coming decades as the population continues to age.[18,33,37] Several factors may explain this rise. Older adults today are more likely than previous historical generations to carry long-standing exposure to opioids either through decades of pharmaceutical opioid prescribing or the unregulated drug supply, and many are aging with OUD diagnoses that were established earlier in life.[4-6] Moreover, as the drug toxicity crisis has evolved throughout Canada, a growing recognition of OUD may also be playing a role in increased screening, diagnosis, and access to treatment later in life. As such, the observed increases in the rates of older adults identified with OUD in the province likely reflects an intersection of an aging population with greater opioid exposure as well as expanding access and engagements with treatment options such as OAT, the use of which has more than tripled in this population since 2013. With 1 in 350 older Ontarians aged 55+ identified with an OUD by the end of 2025, there is a clear need for system planning, preparedness, and coordination across a spectrum of harm reduction, social support, treatment, and clinical care settings to support a growing, aging population of people who use substances.

Among older adults who died of an opioid toxicity, we found that just over one-third (38%) had a healthcare interaction for OUD in the previous 5 years, a lower proportion than reported in the general Ontario population (over 50%).[38,39] Prior research has suggested that older populations are less likely to be screened, diagnosed, and treated for OUD compared to younger counterparts, which has been tied to misperception regarding the presence and presentation of OUD in older adults as well as an under-recognition of the benefit of treatment in this age group.[32-36] This is particularly important as 1 in 4 older adults who died of an opioid toxicity had a healthcare encounter in the week prior to death, meaning that a lack of screening for OUD may translate to missed opportunities for intervention at critical touchpoints. This highlights a critical need to equip healthcare providers across the various settings in the care continuum (i.e., primary care, hospitals, community health care centers, and walk-in-clinics) to screen for and identify OUD among older adults and make subsequent connections to community-based treatment, harm reduction, and social supports.[34] Low-barrier access to harm reduction remains important for preventing harms in this population, including for people not engaged in formal care, as evidenced by the decedents in our study whose OUD-related healthcare engagement predated the 5-year period before their death. Given the high prevalence of comorbidities and complex care needs among older adults who use substances, coordinated efforts remain necessary to improve access to primary care with competency in providing concurrent substance use care. At the same time, building clinical competency in distinguishing age-related pain management needs from OUD, and in managing both conditions when they occur concurrently, remains essential. Finally, with research pointing to older adults being less likely to disclose substance use history to health providers,[34,36] creating safe, non-stigmatizing and judgement-free environments within healthcare settings—including settings providing health services specifically tailored to older adults—remain essential to care.

System Readiness for OUD and Equitable Access to LTC

Whereas the number of older adults identified with an OUD increased from 2017 to 2025, we found that it was uncommon for older adults with OUD to reside in LTC, and that this number did not change appreciably over the study period. There are likely a number of reasons for this finding. Research has shown that people with OUD often face long-standing discriminatory barriers with entry into institutional settings such as LTC,

where substance use history and/or OUD diagnosis has been reported to influence admission decisions, reflecting broader patterns of institutional stigma affecting people with OUD.[40-43] System readiness to provide OUD care within LTC also remains a significant barrier to access, as facilities generally describe the lack of clinical infrastructure, staff expertise, and pharmacy relationships to support OUD care as a reason for being ill-equipped to admit and care for this population.[43,44] With respect to OAT in particular, gaps in clinical infrastructure needed to support its administration within LTC may exist, including LTC-contracted pharmacies being unwilling to dispense OAT and low staffing levels impacting ability for witnessed dosing and ongoing observation requirements.[43,44] These challenges may be particularly pronounced for methadone which has stricter daily witnessed dosing requirements that may need more intensive coordination with an external pharmacy or OAT clinic.[40,41,44] Moreover, methadone's complex clinical management due to heightened concerns around cardiovascular risk, drug-drug interactions, and toxicity during dose titration—risks that are particularly compounded in older adults due to age-related physiological changes and polypharmacy—may further complicate administration in the absence of clinical resources and expertise within LTC.[45-47] However, there remains an existing opportunity to facilitate low-barrier methadone dispensing through community pharmacies that already service LTC facilities within Canada's current regulatory framework.[48] On the other hand, patient hesitancy to enter LTC may stem from concerns around undertreated pain, inadequate access to OUD care, and loss of access to addiction-medicine specialists and other community-based supports.[49] Taken together, continued limited representation of older adults with OUD within LTC, despite notable increases in OUD-related healthcare interactions in this population is notable, and warrants closer examination of whether admission criteria, system readiness, capacity, or willingness to support OUD may be sustaining barriers to access. Developing the clinical infrastructure needed to support OAT within settings that care for older adults, alongside proactive transition planning that prioritizes patient autonomy for preferred treatment and continuity of supports, are clear opportunities for system planning and competency building.[42] Transitional programs underway in some jurisdictions represent a promising model that may help bridge referral gaps and transitions to LTC for people living with substance use disorder and those who use substances.[50]

Circumstances Surrounding Opioid Toxicity Deaths in Older Populations

Impacts of Housing, Social Isolation, and Homelessness

Among older adults who died of an opioid toxicity, the vast majority of toxicity incidents occurred within a private dwelling (78%), and where information was known, roughly one-quarter of deaths occurred in the presence of someone who was able to intervene. This demonstrates the impacts of substance use occurring at home when people are alone, and points to the need to consider tailored programs and services to support substance use health that are accessible to people living at home who may have mobility or transportation limitations. Particularly, there is a need to enhance education and awareness initiatives targeted towards older adults and their caregivers and families that encompass guidance on recognizing and discussing concerning substance use patterns, as well as identifying signs of opioid toxicity and how to respond. Further, take-home naloxone programs that specifically prioritize older adults and their families, friends, and care providers may be an opportunity to scale overdose response measures in this population.[51] An additional opportunity lies with home care services, which often provide care to older adults. In this report, we found that 1 in 4 older adults had received a home care service in the year before their toxicity death, suggesting that home care is a key healthcare touchpoint for this population, and expanded competencies among this workforce related to substance use disorder identification, support, overdose response with naloxone, and harm reduction principles remain essential.[52] Although there were relatively fewer opioid toxicity deaths among people aged 75 and older (N=27), deaths in this age group more commonly involved pharmaceutical opioids, deaths by suicide, and occurred without anyone present to intervene (where information was known) compared to younger cohorts of older adults (aged 55-74).

Importantly, 115 opioid toxicity deaths occurred among older adults experiencing homelessness (11.7% of linked deaths), which highlights vulnerabilities for older adults navigating housing and income precarity and the need for interventions at the intersection of aging, homelessness, and substance use. Broadly, evidence continues to point to a growing population of aging adults who are at immediate risk of homelessness later in life as demand for affordable housing has risen.[53,54] However, punitive policies towards substance use and the absence of treatment and harm reduction services within most housing support services can make transitions to housing environments difficult.[55,56] This is further compounded for older adults who are more likely to present with complex care needs for which these settings may not be adequately resourced to manage.[55] As such, in addition to continued expansion of supportive housing initiatives, opportunities exist for collaboration across housing, health, and substance use services, and the development of specialized housing models that take into account the age-related and complex care needs of older adults, with particular attention to the needs of older adults who use substances and/or who may be experiencing homelessness.[55,57,58] As new models for supportive housing that care for people with complex medical and social needs continue to expand in Ontario, planning should include considerations for older adults who use substances. One example of these efforts is the planned expansion of Dunn House in Toronto, which aims to provide affordable housing units to at-risk seniors who frequent emergency departments, integrating on-site access to health and social services.[59]

Considerations around Pain Management and Pharmaceutical Opioid Prescribing

Pharmaceutical opioids emerged as an important contributor to opioid toxicity deaths among older adults, with 32% of deaths (N=377) involving pharmaceutical opioids only (without combined involvement of non-pharmaceutical opioids), a rate that is higher than that observed in the general Ontario population (25%).[29] Prescribed opioids also emerged as a larger driver of harm in older age groups, with roughly two-thirds of opioid toxicity deaths among those aged 75+, and just under half of deaths among those aged [65-74] involving only pharmaceutical opioids. Importantly, the clinical picture in this population requires careful consideration as we observed a high prevalence of pain-related conditions, injuries, and complex comorbidities among older adults for which opioids may be indicated. Specifically, over 50% of decedents had experienced one or more pain-related condition or injury in the 5 years prior. As such, there is an inherent complexity with managing pain and opioid toxicity risk concurrently in an older population with multiple comorbidities and complex medication regimens. At the same time, safer prescribing of opioids remains a priority for this population, given known risks associated with chronic opioid use that are further compounded by unique factors that may amplify potential for harm among older adults, even when opioids are clinically indicated. This includes age-related biological changes that alter opioid metabolism and potency, elevated risks of drug-drug interactions in the context of polypharmacy (i.e., use of multiple medications), and potential for inappropriate prescribing or dosing errors in the management of complex treatment regimens.[10,60,61] One example of potential polypharmacy risk among older adults, is evident in the high rate of benzodiazepine prescribing in the 3 months before opioid toxicity death (25%), with pharmaceutical benzodiazepines ultimately contributing to 8% of all deaths. Taken together, the application of opioid prescribing guidance aimed at preventing harms needs to be carefully balanced with pain needs of individual patients to avoid rapid dose tapering, abrupt discontinuation, and refusal of healthcare providers to properly treat pain, which can carry unintended consequences and potentially elevated risk of opioid-related harms.[4,22-24] These challenges are further amplified by significant gaps in evidence-based guidance on opioid prescribing to manage pain among those with OUD, which can complicate clinical decision-making and quality of care for older adults with high levels of pain.[62] Particularly, within institutional settings caring for older adults, lack of knowledge on adequate pain management for people with OUD who may already be receiving pharmacologic treatments, such as OAT, can lead to undertreated pain.[49] Given this clinical complexity and with an aging population of people with OUD, there is an emerging need for high quality evidence and clinical guidance on how to best care for people with concurrent substance use disorder and pain management needs.

Rising Harms from the Unregulated Drug Supply in Older Populations

An important finding of this report is that harms from the unregulated drug supply have risen substantially among older adults in Ontario, with the proportion of opioid toxicity deaths involving fentanyl doubling between 2017 and 2024 (from 31% to 62%) and peaking over the pandemic period (80%). Therefore, with the majority of opioid toxicity deaths among older adults having non-pharmaceutical opioids as direct contributors, it is important to ensure that substance use health is prioritized among people as they age, including screening, low-barrier access to treatment, and harm reduction services. Further, some of these services require adaptation to meet the accessibility needs of older adults experiencing disabilities, frailty, age-related mobility issues, transportation limitations, and for those living in congregate settings. For example, opportunities to provide more accessible substance use care may involve expanding mobile harm reduction and substance use outreach models, improving access to OUD treatment via community paramedicine and virtual consults, or other models that reduce requirements for frequent healthcare interactions (such as supervised OAT witnessing within home settings and flexible take-home dosing). Importantly, we found a high prevalence of polysubstance involvement in deaths across all age groups (predominately stimulant and benzodiazepines primarily from unregulated sources), which is consistent with broader province-wide trends.[29] The implications of prevalent unregulated polysubstance exposure among older adults warrant further attention to understand complexities around toxicity risk given age-related biological changes, prevalent co-morbidities, and high rates of prescribed polypharmacy in this population.

Conclusion

Overall, this report shows rising healthcare interactions related to OUD and opioid toxicity harms among older adults in Ontario. As people with OUD age in the province, there is a pressing need for system readiness and competency building in substance use health across healthcare and social service systems that may currently be underprepared or unequipped for the scale of this shift. The high clinical complexity and pain management needs of this population, limited system readiness in LTC and home care, and the compounding impacts of accessibility barriers and social isolation for older adults living at home, create an urgent need to proactively adapt care delivery, resourcing, and training to ensure high-quality care for people who use substances as they age.

About the Ontario Drug Policy Research Network

The Ontario Drug Policy Research Network (ODPRN) is a province-wide network of researchers who provide timely, high quality, drug policy relevant research to decision makers. The ODPRN houses the Ontario Opioid Drug Observatory (OODO) which is funded through a grant from the Canadian Institutes of Health Research (CIHR). This observatory aims to measure, assess and evaluate the use of prescription opioids, opioid-related toxicities, and opioid-related drug policy by leveraging large, population-level data sources. For more information, visit **odprn.ca**.

For more details on the underlying data or methods in this document, contact **tara.gomes@unityhealth.to**.

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Disclaimer

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Supporting Resources

The content discussed in this report deals with topics that may be challenging or sensitive due to its subject matter. The research team recognizes the need for safety measures to minimize the risks associated with potentially traumatic topics. For immediate assistance, call 1-866-531-2600. This is a provincial, toll-free call line providing mental health counselling and substance use support for people across Ontario. For concerns about suicide, call the 9-8-8: Suicide Crisis Helpline for immediate, confidential support or visit: **https://988.ca/**.

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Appendix A: Definitions

Older Adults:

Individuals aged 55 years and older.

Opioids:

A family of substances that include pharmaceutical opioids available through prescription for the treatment of pain and opioid use disorder (e.g., oxycodone, hydromorphone, morphine, methadone) and non-pharmaceutical opioids (e.g., heroin, fentanyl, carfentanil).

Opioid Toxicity Death:

An acute intoxication/toxicity death resulting from the direct contribution of consumed substance(s), where one or more of the substances was an opioid, regardless of how the opioid was obtained.

Opioid Agonist Treatment (OAT):

A treatment recommended in the care of people with OUD. The OAT types that are examined in this report, are methadone and the combination product buprenorphine/naloxone (commonly known by its brand name Suboxone®) and slow-release oral morphine (SROM). We also included longer-acting buprenorphine formulations (Sublocade® and Probuphine®). These medications are opioids that aid in the prevention of opioid withdrawal and cravings and can block the euphoric effect of other opioids.

Opioid Use Disorder (OUD):

A medical condition associated with cravings for opioids that may lead to chronic use of opioids and behaviours that may interfere with the activities of daily life. Further information on the definition we used for this report, is summarized in Appendix B below.

Origin of Opioids:

Non-pharmaceutcial opioids refer to those produced outside regulated drug supply chains (e.g., illicitly manufactured fentanyl). Pharmaceutical opioids are those manufactured and regulated for medical use (e.g., prescribed oxycodone).

- Opioids with primarily unregulated and non-pharmaceutical origins include:
  - Heroin, heroin metabolites (morphine where monoacetylmorphine (6-MAM) was also detected), U-47700, Nitazene.
  - Fentanyl, fentanyl analogues (including carfentanil).
- Opioids with primarily regulated and pharmaceutical origins include:
  - Buprenorphine, codeine, hydrocodone, hydromorphone, methadone, morphine where 6-MAM was not detected, oxycodone, oxymorphone, or tramadol. This category may include opioids that were prescribed to the deceased person or that were prescribed to someone else (i.e., diverted).

Benzodiazepines:

A class of sedative and anti-anxiety drugs that are widely prescribed for the treatment of anxiety, sleep disorders (e.g., insomnia), certain forms of epilepsy, and alcohol withdrawal. Currently, 14 different benzodiazepines are approved for use in Canada. Benzodiazepines that are not approved for medical use in Canada, such as etizolam, are increasingly being found in the unregulated drug supply.

Origin of Benzodiazepines:

- Benzodiazepines with primarily unregulated and non-pharmaceutical origins:
- Indicates the presence of benzodiazepines (non-prescription only; exclusively bromazolam, etizolam, flualprazolam and flubromazolam).
- Benzodiazepines with primarily regulated and pharmaceutical origins:
- Indicates the presence of benzodiazepines (prescription only; i.e., excluding bromazolam, etizolam, flualprazolam, and flubromazolam).

Stimulants:

A class of drugs used for the treatment of attention-deficit/hyperactivity disorder and sleeping disorders (e.g., narcolepsy). These drugs act on the central nervous system to increase alertness, attention and energy. This category also includes stimulants that are used occasionally and primarily available from the unregulated market, such as cocaine and methamphetamine.

Substance Involvement in Opioid Toxicity Deaths:

- Detected: Substances detected in toxicology testing, which may or may not have directly contributed to the death.
- Directly contributing to death: Substances determined by the pathologist and/or coroner to have directly contributed to the death based on the complete investigative findings, i.e., toxicology findings and the information obtained during the death investigation.

Metabolites:

We undertook the following steps to exclude potential metabolites from post-mortem toxicology throughout our analyses:

- Removing the indication of oxymorphone (which is not prescribed in Ontario) and flagging as oxycodone if its metabolite oxymorphone was present; and
- Removing the indication of hydrocodone if both hydrocodone and codeine were present, as there are few deaths with both hydrocodone and codeine as either a direct contributor or detected; and
- Removing the indication of amphetamine if both amphetamine and methamphetamine were present, as amphetamine is assumed to be metabolite of methamphetamine.

Living Arrangement:

- **Private dwelling:** A separate set of living quarters designed for or converted for human habitation. Must include a source of heat or power and must be an enclosed space that provides shelter/protection from the elements. May include people living with family or roommates.
- **People experiencing homelessness:** Includes unsheltered, emergency sheltered, provisionally accommodated, or at immediate risk of homelessness.
- **Other collective dwelling:** Includes lodging and rooming houses, hotels, military bases, sober living facility.
- **Residential care facility (including group homes):** Institutions or establishments that provide accommodation, and potentially treatment, to various groups (e.g., people with disabilities).
- **Retirement home (including senior residences):** Residences that provide support services and care for seniors.

- **Hospital or long-term care home:** Provides care and services for people who are unable to live independently or who require onsite nursing care, 24-hour supervision or personal support. A facility that has beds under the Long-Term Care Homes Act.
- **Correctional facility:** May include federal correctional institutions, provincial and territorial custodial facilities, young offenders facilities, jails, and police lock-up facilities.
- **Unknown:** Missing, Unknown.

Location of Incident:

- **Private residence:** Includes farm, residence, on property.
- **Congregate living:** Includes LTC facility, LTC facility - other (e.g. group home), retirement home, seniors residence (assisted living), rooming house, boarding house, halfway house.
- **Hospital/Clinic:** Includes hospital - acute care, hospital - chronic care, palliative care, rehabilitation, emergency department - alive on arrival, emergency department - vsa on arrival, outpatient, other, psychiatric, psychiatric ward of general hospital), medical office, nursing station, walk-in clinic, ambulance.
- **Outdoor:** Outdoor areas including in-transit (crosswalk, highway, intersection, ramp, road, roadside, sidewalk), parking lot, public area - outside, non residence, railway (non-subway) - not on board, rural outdoors, trail, urban park, urban parkland.
- **Shelter:** Includes shelter.
- **Hotel/Motel:** Includes hotel, motel, resort.
- **Public building:** Includes airport, arena, gymnasium, health club, inside, non-residence - leisure, inside, non-residence - workplace, parking garage, school, subway - track level.
- **Other:** Includes water environment (hot tub, sauna, steam bath, whirlpool, swimming/snorkeling, water - non-pool, water- pool).

Rural Ontario:

A community with a population of 10,000 people or less, as assigned by Statistics Canada based on the postal code associated with the individual's health card.

Rate:

The frequency with which an event or circumstance occurs per unit of time, population, or other standard of comparison. Example: Based on a rate of 1.5 deaths per 10,000 people, we can expect approximately 15 deaths in a community of 100,000.

Appendix B: Diagnosis Codes Used to Identify Healthcare Encounters and Health Conditions

Table B1: Health Conditions: History of Opioid Use Disorder (OUD)

History of OUD defined as meeting any one of the criteria below in the 5 years prior to death:

Criteria	Data Source	Codes
Any outpatient OAT feecodes	OHIP Claims Database	OHIP feecodes: K682, K683, K684 Note: OHIP K-codes were initially implemented in mid-2011
Any emergency department visit or acute hospital admission with a diagnosis code for opioid-related dependence	NACRS, DAD	ICD-10 diagnosis code: F11
Any mental health-related hospital admission with a diagnosis code for OUD	OMHRS	DSM diagnosis codes: 304.0, 305.5 or ICD-10 diagnosis code: F11
Received a prescription for OAT (methadone, the combination product buprenorphine/ naloxone, Probuphine, Sublocade)	NMS	N/A
Received a prescription for OAT (methadone, the combination product buprenorphine/ naloxone, Probuphine, Sublocade)	NMS	N/A

OHIP: Ontario Health Insurance Plan NACRS: National Ambulatory Care Reporting System; DAD: Discharge Abstract Database; OMHRS: Ontario Mental Health Reporting System; NMS: Narcotics Monitoring System.

Table B2: Definition of Hospital-Treated Non-Fatal Opioid Toxicity

Condition	Criteria	Data Source	Codes
Hospital-treated non-fatal opioid toxicity	Emergency department visit or hospital admission for an opioid toxicity excluding episodes where the discharge disposition was death	NACRS (all diagnosis types), DAD (admission diagnoses)	ICD-10 diagnosis codes: • T400: Poisoning by opium • T401: Poisoning by heroin • T402: Poisoning by other opioids • T403: Poisoning by methadone • T404: Poisoning by other synthetic narcotics • T406: Poisoning by unspecified and other narcotics Intention of toxicity (using E codes on the same record): • Accidental (X42) • Intentional self-harm (X62) • Undetermined/Unknown/Missing (all others) Note: Exclude episodes where the discharge disposition was death.

Table B3: Health Encounters

Type of Encounter/ Condition	Criteria	Data Source	Codes
Any healthcare encounters include:			
Any outpatient care	• Any visit outside of a community health centre (with any provider type) in an office, home care, or virtual, long-term care. • Any visit to a community health centre with a physician (i.e. General Practitioner) or nurse practitioner Note: captures all outpatient primary care visits defined below	OHIP Claims Database, CHC	N/A
Outpatient primary care	Outpatient primary care visits were defined as either of the following: • Any visit to a community health centre with a physician (i.e. General Practitioner) or nurse practitioner • A visit outside of a community health centre with a physician practicing in family medicine, pediatrics, or community medicine, or to a nurse practitioner, in which billing codes related to primary care were submitted. Visits must have occurred in an office, home care, virtual, long-term care, or undefined setting	OHIP Claims Database, CHC	**OHIP feecodes:** A001, A002, A003, A007, A903, E075, G212, G271, G372, G373, G365, G538, G539, G590, G591, K005, K013, K017, P004, K130, K131, K132, K030, K080, K081, K082, A261, A268, K267, K269
Acute inpatient hospital admission	Any acute-care related hospital admission. Excludes admissions to adult-designated mental health beds. Includes admissions related to mental health care for children and adolescents (i.e., people less than 18 years of age). Note: To ascertain discharges before medically advised (BMA), we captured records with discharge disposition codes indicating where patients left against medical advice, were absent without leave, or did not return from pass or leave.	DAD	N/A
Emergency department visit	Any visit to an emergency department. Excludes admissions to adult-designated mental health beds. Includes admissions related to mental health care for children and adolescents (i.e., people less than 18 years of age) Note: To ascertain discharges before medically advised (BMA), we captured records with discharge disposition codes indicating where patients left against medical advice at any point following registration, triage, initial-assessment, or post-treatment initiation. Note: Excludes visits that resulted in death.	NACRS	N/A
Mental health-related hospital admission	Any admission to an adult-designated (i.e., people 18 years of age or older) mental health bed in a hospital Note: Excludes visits that resulted in death.	OMHRS	N/A
Opioid toxicity-related emergency department visits and hospitalizations	Emergency department visit or hospital admission for opioid toxicity. Note: Excludes visits that resulted in death.	NACRS, DAD	**ICD-10 diagnosis codes:** T40.0, T40.1, T40.2, T40.3, T40.4, T40.6

DAD: Discharge Abstract Database; NACRS: National Ambulatory Care Reporting System; OHIP: Ontario Health Insurance Plan; CHC: Community Health Centre; OMHRS: Ontario Mental Health Reporting System.

Table B4: Health Conditions: History of a Mental Health-Related Healthcare Encounter

History of a mental health-related healthcare encounter was defined as meeting any one of the criteria below:

Criteria	Data Source	Codes	
Outpatient visits (in settings other than community health centres) for mental health-related reasons in the 5 years prior to death:			
Any visit with a diagnosis code for psychotic disorders	OHIP Claims Database	OHIP diagnosis codes: 295, 297, 298	
Any visit with a diagnosis code for mood and anxiety disorders	OHIP Claims Database	OHIP diagnosis codes: 296, 300, 311	
Any visit with a diagnosis code for substance use disorders	OHIP Claims Database	OHIP diagnosis codes: 291, 292, 303, 304	
Any visit with a diagnosis code for behavioural and neuro-developmental disorders	OHIP Claims Database	OHIP diagnosis codes: 299, 313, 314, 315	
Any visit with a diagnosis code for other mental health-related disorders	OHIP Claims Database	OHIP diagnosis codes: 301, 302, 306, 307, 309	
Outpatient visits in community health centres for mental health-related reasons in the 5 years prior to death:			
Any visit with a diagnosis code for any mental health condition or disorder	CHC	Any ICD-10 diagnosis code between F06 and F99 in the primary diagnostic position, excluding dementia and delirium-related diagnoses	
Emergency department visit or acute hospital admission for mental health-related reasons, or admission in adult-designated mental health bed			
Any emergency department visit, acute hospital admission, or admission to an adult-designated mental health bed with a diagnosis code for the following in the 5 years prior to death:			
Any mental health and addictions	NACRS, DAD, OMHRS	**ICD-9-CM codes (OMHRS DSM-V):** DSM5CODE_DISCH1 = Any OMHRS (includes missing; excludes 290.x, 294.0x-). Exclude if DSM5CODE_DISCH 1 missing and Provisional = 17	**ICD-10-CA codes (DAD/NACRS):** DX10CODE1 = F06-F99 or DX10CODE2-DX10CODE10 = X60-X84, Y10-Y19, Y28 when DX10CODE1 ne F06-F99
Anxiety disorders	NACRS, DAD, OMHRS	**ICD-9-CM codes (OMHRS DSM-V):** DSM5CODE_DISCH1 = 293.84, 300, 300.0x, 300.2x, 309.21, 313.23. Provisional = 5	**ICD-10-CA codes (DAD/NACRS):** DX10CODE1 = F06.4, F40, F41, F93.0-2, F94.0
Substance-related and addictive disorders	NACRS, DAD, OMHRS	**ICD-9-CM codes (OMHRS DSM-V):** DSM5CODE_DISCH1 = 291.x (all 291 codes), 292.x (all 292 codes), 303.x (all 303 codes), 304.x (all 304 codes), 305.x. Can be split into sub-groups: a. 291.x,303.x,3050 = Alcohol b. 3040,3047,3055 = Opioids c. 292.x, 304 [excl 3040,3047], 305 [excl 3050, 3055] = Other drugs Provisional = 16	**ICD-10-CA codes (DAD/NACRS):** DX10CODE1 = F10-19, F55 Can be split into sub-groups: F10 = Alcohol F11 = Opioids F12, F13, F14, F15, F16, F18, F19 = Other drugs F17, F55 = Other
Schizophrenia spectrum and other psychotic disorders	NACRS, DAD, OMHRS	**ICD-9-CM codes (OMHRS DSM-V):** DSM5CODE_DISCH1 = 293.81, 293.82, 295.x (all 295 codes), 297.x (all 297 codes), 298.x (all 298 codes). Provisional = 2	**ICD-10-CA codes (DAD/NACRS):** DX10CODE1 = F06.0-2, F20, F22-F29, F53.1

Criteria	Data Source	Codes	
Mood disorders	NACRS, DAD, OMHRS	**ICD-9-CM codes (OMHRS DSM-V):** DSM5CODE_DISCH1 = 293.83, 296.x (all 296 codes), 300.4x, 301.13, 311.x, 625.4. Provisional = 3, 4 Can be split as follows: Bipolar [296.0x, 296.4x, 296.5x, 296.6x, 296.7x, 296.8x, 301.13. provisional=3], Depressive [296.2x, 296.3x, 296.9x, 300.4x, 311.x, 625.4x. provisional=4], Other mood [293.83]	**ICD-10-CA codes (DAD/NACRS):** DX10CODE1 = F06.3, F30.x-F34.x, F38.x, F39.x, F53.0 Can be split as follows: Bipolar [F30.x, F31.x, F34.0], Depressive [F32.x, F33.x, F34.1,], Other mood [F06.3, F38.x, F39.x, F53.0, F34.8, F34.9]
Trauma/stressor-related disorders	NACRS, DAD, OMHRS	**ICD-9-CM codes (OMHRS DSM-V):** DSM5CODE_DISCH1 = 308.3x, 309, 309.0x, 309.24, 309.28, 309.3x, 309.4x, 309.81, 309.89, 309.9x, 313.89. Provisional = 7	**ICD-10-CA codes (DAD/NACRS):** DX10CODE1 = F43.x, F94.1, F94.2
OCD & related disorders	NACRS, DAD, OMHRS	**ICD-9-CM codes (OMHRS DSM-V):** DSM5CODE_DISCH1 = 300.3x, 300.7x, 312.39, 698.4x. Provisional = 6	**ICD-10-CA codes (DAD/NACRS):** DX10CODE1 = F42.x, F45.2, F63.3
Personality disorders	NACRS, DAD, OMHRS	**ICD-9-CM codes (OMHRS DSM-V):** DSM5CODE_DISCH1 = 301, 301.0x, 301.2x, 301.4x, 301.5x, 301.6x, 301.7x, 301.81-3, 301.89, 301.9x 310.1. Provisional = 18	**ICD-10-CA codes (DAD/NACRS):** DX10CODE1 = F07, F21, F60, F61, F62. F68, F69
Deliberate self-harm	NACRS, DAD	**ICD-9-CM codes (OMHRS DSM-V):** N/A (DAD/NACRS)	**ICD-10-CA codes (DAD/NACRS):** DX10CODE2-10 (NACRS)/DXCODE2-25(DAD) = X60-X84, Y10-Y19, Y28 when DX10CODE1 ne F06-F99

NACRS: National Ambulatory Care Reporting System; DAD: Discharge Abstract Database; OMHRS: Ontario Mental Health Reporting System.

Table B5: Health Conditions: Health History and Diagnosed Conditions

Condition	Criteria	Data Source	Codes
HIV	HIV diagnosis prior to and including death date	Ontario HIV Database	N/A
Hepatitis C	Hepatitis C diagnoses defined as meeting any one of the criteria below: • Prescription direct-acting antiviral use in the 5 years prior to and including death date (ODB) • Hospital visits (DAD, NACRS) with diagnosis codes for hepatitis C in the 5 years prior to death	ODB, NACRS, DAD	ICD-10 diagnoses codes (DAD, NACRS): B171, B182 and Z2251
Diabetes	Diabetes diagnosis prior to and including death date	Ontario Diabetes Database	N/A
Dementia	Dementia diagnosis prior to and including death date	Ontario Dementia Database	N/A
Hypertension Database	Hypertension diagnosis prior to and including death date	Ontario Hypertension Database	N/A
Congestive Heart Failure (CHF)	CHF diagnosis prior to and including death date	ICES derived Cohort Congestive Heart Failure	N/A
Chronic Obstructive Pulmonary Disease (COPD)	COPD diagnosis prior to and including death date	ICES derived Cohort Chronic Obstructive Pulmonary Disease	N/A
Johns Hopkins Aggregated Diagnosis Groups (ADGs)	John Hopkins ADGs in the 2 years prior to (excluding) death date Note: John Hopkins ADGs measure the complexity of an individual's health need and are commonly used as standard proxy for comorbidity burden. Scores range from 0-32, with higher counts reflecting more complex health needs. In this report, 0-5 ADGs reflects lower complexity, 6-10 ADGS reflects moderate complexity and 10 or more reflects higher complexity.	DAD, SDS, OHIP	Note: Relies on specialized Macro
Alcohol Use Disorder	Any alcohol use disorder hospital or outpatient diagnosis in the 5 years prior to death	OHIP, OMHRS, DAD, NACRS	**OHIP diagnosis codes:** 291, 303 **ICD-9 diagnosis codes (OMHRS):** 291.x (excl. 291.82), 303.x, 305.0 **ICD-10 diagnosis codes (DAD, NACRS, OMHRS):** F10, K70, G312, G621, G721, I426, K292, K860, Z502, Z714, Z8640, E244, K852.
Receipt of home care service	Any home care service in the 1 year prior to (including) death	Home Care Database Services	N/A
Receipt of home care service	Any palliative service in the 1 year prior to (including) death	OHIP, NACRS, DAD, Continuing Care Reporting System, Home Care Database, Resident Assessment Instrument	Note: Relies on ICES Macro with palliative care diagnoses codes derived from specified data sources.

DAD: Discharge Abstract Database; NACRS: National Ambulatory Care Reporting System; ODB: Ontario Drug Benefit

Table B6: Health Conditions: Pain-related Injuries and Conditions

Type of Encounter/ Condition	Criteria	Data Source	Codes
Arthritis and related conditions	Any healthcare visits for arthritis and related conditions (including inflammatory arthritis, other arthritis, soft tissue disorders, joint derangement, unspecified arthritis).	OHIP, DAD, SDS, NACRS	**ICD-10 diagnosis codes (NACRS, DAD, SDS):** M05-M09, M45, M46, M30-M36, M15-M19, M00-M03, M12, M10, M11, M14, M65-M71, M60-M63, M72-M73, M75-M77, M79, M22-M24, M13, M96, M99 **OHIP diagnosis codes:** 714, 720, 710, 446, 711, 715, 716, 274, 712, 727, 728, 729, 717, 718, 739
Bone and spinal conditions	Any healthcare visit for bone and spinal conditions.	OHIP, DAD, SDS, NACRS	**ICD-10 diagnosis codes (NACRS, DAD, SDS):** M40-M43, M47, M49-M54, M48.0-M48.3, M48.8-M48.9, M80-M90, M91-M94, M48.4, M48.5, M20, M21.4, L60.0, L60.2, L84 **OHIP diagnosis codes:** 721, 722, 723, 724, 725, 737, 730, 731, 732, 733, 734, 735
Fractures, dislocations, strains or sprains	Any healthcare visits for fractures, dislocations, strains or sprains.	OHIP, DAD, SDS, NACRS	**ICD-10 diagnosis codes (NACRS, DAD, SDS):** T08, S12, S32, S42, S52, S62, S72, S82, S92, S13.0-S13.3, S33.0-S33.3, S43.0-S43.3, S53.0-S53.1, S63.0-S63.2, S73.0, S83.0-S83.1, S93.0-S93.3, S13.4, S13.5, S33.5-S33.7 S43.4-S43.7, S53.2-S53.4, S63.3-S63.7, S73.1, S83.2-S83.7, S93.4-S93.6 **OHIP diagnosis codes:** 802, 803, 805, 806, 807, 808, 810, 812, 813, 814, 815, 816, 821, 823, 824, 827, 829, 831, 832, 834, 839, 840, 841, 842, 843, 844, 845, 847, 848
Low back pain	Any healthcare visit for low back pain, including outpatient and hospital visits as well as spinal imaging procedures.	OHIP, DAD, SDS, NACRS	**ICD-10 diagnosis codes (NACRS, DAD, SDS):** M47.26, M47.27, M47.28, M47.86, M47.87, M47.88, M47.96, M47.97, M47.98, M48.06, M48.07, M48.08, M48.86, M48.87, M48.88, M48.96, M48.97, M48.98, M51.0, M51.1, M51.2, M51.3, M51.9, M53.3, M53.86, M53.87, M53.88, M54.10, M54.16, M54.17, M54.18, M54.19, M54.3, M54.4, M54.5, M54.8, M54.9, M99.83, M99.93, M99.03, M99.84, M99.94, M99.04, S33.5, S33.6, S33.7, S33.8 **CCI (NACRS, DAD, SDS):** 3SC10KM, 3SC10VA, 3SC10VN, 3SE10VK, 3SC12AY, 3SC12VA, 3SE12VA, 3SE12VK, 3SF12VA, 3SF12VL, 3SF10VA, 3SF10VL **OHIP diagnosis codes:** 722, 724, 847 **OHIP Feecode:** X025, X202, X203, X027, X204, X028, X205, X206, X032, X033, X031, X034, X207, X035, X208
Unspecified musculoskeletal disorders or congenital abnormalities	Any healthcare visit for unspecified musculoskeletal disorders or congenital abnormalities.	OHIP, DAD, SDS, NACRS	ICD-10 diagnosis codes (NACRS, DAD, SDS): M95, M21 excl. M21.4, M25 OHIP diagnosis codes: 754, 755, 756, 781
Major Traumatic Injury (prior 10 years)	Experienced any traumatic injury	Ontario Trauma Registry	N/A
Traumatic brain injury (TBI) (prior 10 years)	Emergency department visit or hospital admission for TBI.	NACRS, DAD	**ICD-10 Diagnosis Code (NACRS, DAD):** F07.2, S02.0, S02.1, S02.3, S02.7, S02.8, S02.9, S06, S07.1, T90.2, T90.5, T06.0
Anoxic or hypoxic brain injury (prior 10 years)	Hospital admission for hypoxic or anoxic brain injury	DAD	**ICD-10 Diagnosis Code (DAD):** Anoxic Brain Injury: Most responsible diagnosis of anoxic brain injury (G93.1) **Hypoxic Brain Injury:** Most responsible diagnosis of hypoxic ischemic brain injury (I46.0, R09.0, R09.2, T71, G92, with G93.1 in dx10code 2-25)
Surgery in the past year	Any healthcare visit for surgery	SDS	N/A

Type of Encounter/ Condition	Criteria	Data Source	Codes
Prior contact with a pain physician in the past year	• Any outpatient visit with a physician practicing in anesthesiology in the year prior to death • Any outpatient visit related to pain management with a family practice/general practice or emergency medicine physician	OHIP	OHIP feecode: A937

CHC: Community Health Centre; DAD: Discharge Abstract Database; DDARD: Drug and Drug/Alcohol Related Death Database; NACRS National Ambulatory Care Reporting System; NMS: Narcotics Monitoring System; OHIP: Ontario Health Insurance Plan; OMHRS: Ontario Mental Health Reporting System; SDS: Same Day Surgery; CCI: Canadian Classification of Health Interventions