January 2016 to June 2023

Apparent Opioid and Stimulant Toxicity Deaths

Surveillance of Opioid and Stimulant-Related Harms in Canada

Public Health Agency of Canada
Agence de la santé publique du Canada

Canada

Technical Notes

Definitions

Apparent opioid toxicity death (AOTD): A death caused by intoxication/toxicity (poisoning) resulting from substance use, where one or more of the substances is an opioid, regardless of how it was obtained (e.g., illegally or through personal prescription). Other substances may also be involved.

Apparent stimulant toxicity death (ASTD): A death caused by intoxication/toxicity (poisoning) resulting from substance use, where one or more of the substances is a stimulant, regardless of how it was obtained (e.g., illegally or through personal prescription). Other substances may also be involved.

Ongoing investigation: Coroners and medical examiners continue to collect information on how and why the death occurred. Data for ongoing investigations are considered preliminary and subject to change.

Completed investigation: Coroners and medical examiners have collected all available information on how and why a death occurred. The time required to complete an investigation and related administrative processes is case-dependent and can range from approximately three to twenty-four months.

Manner of death – Accident: Deaths with completed investigations where the coroner or medical examiner determined that the death was unintentional. This category also includes deaths with ongoing investigations where the manner of death was believed to be unintentional or had not been assigned at the time of reporting.

Manner of death – Suicide: Deaths with completed investigations where the coroner or medical examiner determined that the opioids were consumed with the intent to die. This category also includes deaths with ongoing investigations where suicide was believed to be the manner of death at the time of reporting.

Manner of death – Undetermined: Deaths with completed investigations where a specific manner of death (e.g., accident, suicide) could not be assigned based on available or competing information. For this manner of death category, provinces and territories report only completed investigations with the exception of British Columbia which also includes data from ongoing investigations.

Opioid origin – Pharmaceutical: Deaths with completed investigations where all opioids that directly contributed to death were manufactured by a pharmaceutical company and approved for medical purposes in humans. Pharmaceutical origin does not indicate how the opioids were obtained (e.g., through personal prescription or by other means).

Opioid origin – Non-pharmaceutical: Deaths with completed investigations where all opioids that directly contributed to the death were not manufactured by a pharmaceutical company or not approved for medical purposes in humans.

Opioid origin – Both pharmaceutical and non-pharmaceutical: Deaths with completed investigations where the opioids that directly contributed to the death were a combination of pharmaceutical and non-pharmaceutical opioids, without any opioids of undetermined origin.

Opioid origin – Undetermined: Deaths with completed investigations where, for one or more opioids that directly contributed to the death, it was not possible to determine whether the opioid was pharmaceutical or non-pharmaceutical.

How apparent opioid and stimulant toxicity deaths are counted

Counts or record-level information are provided by the provinces and territories that collect data from their respective offices of Chief Coroners or Chief Medical Examiners. Crude and age-adjusted rates are calculated using the most current population data from Statistics Canada. Age-adjusted rates used the 2016 Canadian population as a reference and direct standardization was applied.

> **Crude rates:** summarize the situation within a region at a certain time period and have not been adjusted for existing differences by provincial and territorial age distributions (e.g., (number of deaths / population) x 100,000).
>
> **Age-adjusted rates:** have been adjusted for existing differences by provincial and territorial age distributions using the 2016 Canadian population as a reference. These rates assume that all regions have the same age distributions and are useful when comparing between regions and over time.

The data provided by the provinces and territories can include deaths:

+ with completed or ongoing investigations
+ where manner of death is classified as accident, suicide, or undetermined

These data **do not** include deaths due to:

+ the medical consequences of long-term substance use or overuse (for example, alcoholic cirrhosis)
+ medical assistance in dying
+ trauma where use of the substance(s) contributed to the circumstances of the injury that lead to the death, but was not directly involved in the death
+ homicide

However, some provincial and territorial differences remain in the type of data reported and in the time periods for which data are available (refer to Table A).

Limitations of the data on apparent opioid and/or stimulant toxicity deaths

Data presented in this update should be interpreted with caution.

- This update is based on data submitted to or extracted by the Public Health Agency of Canada on or before November 1, 2023. New or revised data reported after this date will be reflected in future updates.
- Data released by provinces and territories may differ due to the availability of updated data, differences in the type of data reported (e.g., manner of death), the use of alternate age groupings, differences in time periods presented and/or population estimates used for calculations, etc.
- As some data are based on ongoing investigations by coroners and medical examiners, they are considered preliminary and subject to change. The time required to complete an investigation and related administrative processes is case-dependent and can range from approximately three to twenty-four months.
- This update is based on data that do not specify how the opioids or stimulant were obtained (e.g., illegally or through personal prescription); the level of toxicity may differ depending on the opioid or stimulant (e.g., substance(s) involved, concentration, and dosage).
- Provincial and territorial differences in the death investigation process, death classification method, toxicology testing, and the manner of death reported may impact the interpretation and comparability of the data presented in this update over time and between provinces and territories.
- Data on apparent opioid toxicity deaths and stimulant toxicity deaths are not mutually exclusive. A high proportion of deaths involving a stimulant also involved an opioid. Adding up those numbers would result in an overestimation of the burden of opioids and stimulants.
- Provinces and territories are included in calculations of national crude and age-adjusted rates if they have submitted data for at least one quarter of a given year. For that reason, Manitoba has been excluded from 2023 (Jan to Jun) estimates.
- Quarterly totals for Canada may not equal the annual totals due to suppressed data for some provinces and territories with low numbers of deaths.
- Data on apparent stimulant toxicity deaths were only available from six to nine provinces and territories depending on the year. Therefore, national numbers and rates are not provided in this update. Refer to Table A for more details.

Notes on provincial and territorial data

Due to differences in identifying and reporting cases, comparisons over time and between provinces and territories should be interpreted with caution.

General notes

1. Data reported by some provinces and territories do not include all manners of death (accident, suicide, or undetermined) or stages of investigation (ongoing or completed); refer to Table A for more details.
2. Rates for provinces and territories with relatively smaller populations may change substantially with even slight changes in the number of deaths.
3. British Columbia data from 2016 to 2018 include deaths with completed investigations only. Overall numbers for British Columbia from 2019 to 2023 (Jan to Jun) include deaths with ongoing investigations related to all illicit drugs, including but not limited to opioids and stimulants, used alone or in combination with prescribed/diverted medication. However, stratified data (e.g., by sex or age group) are based only on opioid toxicity deaths for which investigations are completed.
4. Quebec data from 2016 to 2020 include deaths with completed investigations only; death investigations were underway for 2% in 2020. These data encompass deaths that are attributable to opioids for apparent opioid toxicity deaths and deaths that are attributable to stimulants for apparent stimulant toxicity deaths. Available 2021 to 2023 (Jan to Jun) data from Quebec include unintentional deaths with ongoing investigations. These data encompass deaths related to drug or opioid-related intoxication, including, but not limited to, opioids and stimulants. Preliminary data for drug-related poisonings, for which toxicology information was available, indicate that 53% of deaths between January 2021 and June 2023 involved an opioid.
5. Data from Yukon include deaths with completed investigations only. Between 2016 and 2022, two apparent opioid toxicity deaths occurred in a different province following an overdose in Yukon. These deaths are included in the data from the jurisdiction where the deaths occurred and are not reported in the data from Yukon.
6. Data from Prince Edward Island include accidental deaths with completed investigations only. Only annual totals were available for 2016 data from Prince Edward Island; quarterly data for 2016 were not available at the time of this update.
7. In Ontario, apparent opioid toxicity death data were captured using an enhanced data collection tool by the Office of the Chief Coroner (OCC) as of May 1, 2017. Prior to this, retrospective case information was collected using a different tool. Effective September 1, 2021, apparent opioid toxicity death data are captured in the OCC's new case management system for death investigations.
8. For Newfoundland and Labrador, data on apparent opioid toxicity deaths between January 2016 and December 2019 were based on the detection of opioids as indicated on the toxicological report. As of 2020, data include deaths where opioids directly contributed to the death.
9. Saskatchewan data does not include sensitive or suspicious deaths such as those defined where the decedent was involved in a criminal case or an inquest, e.g., deaths in custody.
10. Manitoba data from April 2022 to June 2023 and Yukon data from April to June 2023 were not available at the time of this update.

Manner of death

11. Manner of death is assigned by the coroner or medical examiner during or following an investigation. The data in this update include deaths with a manner of accident, suicide, or undetermined.
12. Suicide data were unavailable from Alberta (2018 to 2023 [Jan to Jun]) and Prince Edward Island.

Sex and age group

13. For most provinces and territories, data on the sex of the individual was based on biological characteristics or legal documentation.
14. Data on deaths where sex was categorized as "Other" were excluded from analyses by sex but were included in overall analyses.
15. Due to rounding, percentages may not add to 100%.
16. For Ontario, from January 2016 to April 2017, sex reflected the sex assigned at birth or biological characteristics at the time of death. From May 2017 to December 2017, sex reflected the perceived or projected identity of the individual. As of January 2018, sex reflects the sex assigned at birth or biological characteristics at the time of death.
17. Alberta uses data on the sex of the individual based on the medical examiner's assessment, which is largely based on biological characteristics. In a small subset of cases where the individual was known to identify with a gender different than their biological sex, the medical examiner may indicate their identified gender.
18. Data on deaths where age group was categorized as "Unknown" were excluded from analyses by age group but were included in overall analyses.

Fentanyl, fentanyl analogues, and non-fentanyl opioids

19. Refer to Table B below for details on opioids.
20. Prior to 2018, the percentage of deaths involving fentanyl and/or fentanyl analogues represented a single category. For data reported for 2018 to 2023 (Jan to Jun), some provinces and territories did not report fentanyl analogue information or required additional information to differentiate fentanyl from fentanyl analogues until investigations were completed. Therefore, deaths involving fentanyl analogues may be included in the fentanyl percentages for some jurisdictions.
21. The sum of percentages by type of opioid may not add up to 100% because a death may involve more than one type of opioid.
22. Observed trends of accidental apparent opioid toxicity deaths involving fentanyl or fentanyl analogues should be interpreted with caution until additional data become available. In addition, changes to testing practices during the reporting period may affect observed trends.
23. Given provincial and territorial differences in death classification methods, the term "involving" includes deaths where the substance was either detected and/or directly contributed to the death. Substances can be detected through toxicology testing and may or may not have directly contributed to the death. Direct contribution to the death is based on investigation by coroner or medical examiner.

24. Available 2021 to 2023 (Jan to Jun) data from Quebec on deaths related to drugs or opioid toxicity where toxicology information was available and fentanyl (or fentanyl analogues) was detected were used to approximate apparent opioid toxicity deaths involving fentanyl (or fentanyl analogues), among deaths where opioids were detected.
25. For Alberta, only data on deaths with completed investigations, where relevant toxicology information was available, were included in percentages for fentanyl, fentanyl analogues, or non-fentanyl opioids.
26. For Ontario, only data on deaths where a cause of death was available were included in percentages for fentanyl, fentanyl analogues, or non-fentanyl opioids.

Origin of opioid(s)

27. The origin of opioid(s) refers to whether the opioids that directly contributed to the death were pharmaceutical, non-pharmaceutical, both, or undetermined.
28. Data on origin were only available for deaths with completed investigations from 2018 onward from between six and nine provinces and territories, depending on the year. Completed investigations represented 78% of accidental apparent opioid toxicity death investigations from these provinces and territories over that period; refer to Table A for more details.
29. Summary data and trends based on origin of opioid(s) should be interpreted with caution until additional data become available.
30. Origin categorization is based on toxicology results and scene evidence and does not indicate how the substances were prepared, their appearance, or how they were "advertised"; nor should it be used to infer the timing or mode of consumption.
31. Pharmaceutical opioids also include those approved for use in humans in other countries, but not necessarily in Canada.
32. For the purposes of origin categorization, deaths involving fentanyl are categorized as "suspected non-pharmaceutical" when there is: 1) no evidence of a patch, vial, or other pharmaceutical formulation at the scene, or 2) no/unknown evidence of a prescription. These deaths are grouped with deaths involving non-pharmaceutical opioids.
33. Origin categorization represents the best estimate based on the information available and should be interpreted with caution.
34. Origin refers only to the opioid(s) involved in death and should not be used as an indication of prior use of opioids of the same or other origin.
35. British Columbia only reports apparent opioid toxicity deaths involving any illicit opioid(s), resulting in a high proportion of non-pharmaceutical opioids. For that reason, data on origin of opioids from British Columbia were not included in the national proportions.

Cocaine, methamphetamine and other stimulants

36. Refer to Table B below for details on stimulants.
37. Amphetamine is a known metabolite of methamphetamine but can also be consumed separately and directly contribute to a toxicity death. Deaths where amphetamine (without methamphetamine) directly contributed to the death are reported under "other stimulants" In situations where both methamphetamine and amphetamine were consumed separately, and both directly contributed to death, the death is reported under both methamphetamine and "other stimulants".
38. Data on apparent stimulant toxicity deaths were available from between six and nine provinces and territories, depending on the year from 2018 to 2023 (Jan to Jun).
39. The sum of percentages by type of stimulant may not add up to 100% because a death may involve more than one type of stimulant.
40. For Ontario, only data on deaths where a cause of death was available were included in percentages for cocaine, methamphetamine, and other stimulants.
41. Data from Quebec on "other stimulants" include deaths involving methamphetamine.
42. For Alberta, only apparent opioid toxicity deaths with completed investigations are used in the numerator for percentage of deaths involving stimulants. As a result, these values may change when more investigations are completed.

Other psychoactive substances

43. Refer to Table B below for details on other psychoactive substances.
44. For Alberta, only data on deaths with completed investigations, where specific substances causing death were listed on the death certificate, were included in percentages of accidental apparent opioid toxicity deaths involving other non-opioid substances.
45. For Ontario, only data on deaths with completed investigations, where relevant toxicology information was available, were included in percentages of accidental apparent opioid toxicity deaths involving other non-opioid substances. Data for non-opioid substances from Ontario between January 2016 and April 2017 were based on their detection and do not include alcohol; as of May 1, 2017, data on non-opioid substances are based on their direct effects and include alcohol.

Data suppression

The suppression of data in this update is based on the preferences of individual provinces or territories to address concerns around releasing small numbers for their jurisdiction.

- Quebec suppressed counts less than five for deaths with ongoing investigations (2021 to 2023 [Jan to Jun]).
- Nova Scotia suppressed all counts for age group 0 to 19 years when stratified by sex.
- Prince Edward Island suppressed counts between one and four for quarterly data, and for any data related to sex or age distribution.
- Newfoundland and Labrador suppressed counts between one and four for quarterly data, and data related to substances involved and sex or age distribution.
- Yukon suppressed counts between one and four for data related to sex or age distribution.
- Nunavut suppressed all counts between one and four.

Suppression was also applied in instances where all data for a province or territory fell into a single category of sex or age group. Further, in situations where a single category of a mutually exclusive variable was suppressed, an additional category was suppressed in order to address privacy concerns.

Table A. Reporting periods, manners of death, and availability of opioid and stimulant data included in this update by province or territory

		BC	AB	SK	MB	ON	QC	NB	NS	PE	NL	YT	NT	NU
Available data on apparent toxicity deaths involving opioids as of November 1, 2023														
2016-18	January to December	✓ (C)	✓	✓ (C)	✓	✓	✓ (C)	✓	✓	✓ (C)	✓ (C)	✓ (C)	✓	✓
2019	January to December	✓	✓	✓ (C)	✓	✓	✓ (C)	✓	✓	✓ (C)	✓ (C)	✓ (C)	✓	✓
2020	January to December	✓	✓	✓ (C)	✓	✓	✓ (C)	✓	✓	✓ (C)	✓ (C)	✓ (C)	✓	✓
2021	January to December	✓	✓	✓ (C)	✓	✓	✓	✓	✓	✓ (C)	✓ (C)	✓ (C)	✓	✓
2022	January to December	✓	✓	✓ (C)	✓ (INC)	✓	✓	✓	✓	✓ (C)	✓ (C)	✓ (C)	✓	✓
2023	January to June	✓	✓	✓ (C)	n/a	✓	✓	✓	✓	✓ (C)	✓ (C)	✓ (C) (INC)	✓	✓
Available data on apparent toxicity deaths involving stimulants as of November 1, 2023														
2018	January to December	✓ (C)	n/a	✓ (C)	n/a	✓	✓ (C)	n/a	✓	n/a	n/a	n/a	n/a	✓
2019	January to December	✓ (C)	n/a	✓ (C)	✓	✓	✓ (C)	n/a	✓	n/a	n/a	n/a	n/a	✓
2020	January to December	✓ (C)	n/a	✓ (C)	✓	✓	✓ (C)	n/a	✓	n/a	✓ (C)	n/a	✓	✓
2021	January to December	✓ (C)	n/a	✓ (C)	✓	✓	n/a	n/a	✓	n/a	✓ (C)	✓ (C)	✓	✓
2022	January to December	✓ (C)	n/a	✓ (C)	✓ (INC)	✓	n/a	n/a	✓	n/a	✓ (C)	✓ (C)	✓	✓
2023	January to June	✓ (C)	n/a	✓ (C)	n/a	✓	n/a	n/a	✓	n/a	✓ (C)	✓ (C) (INC)	✓	✓
Classification of deaths included in the reported data														
Accident	Completed investigations	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Ongoing investigations where manner of death was believed to be unintentional	✓	-	n/a	✓	-	✓	✓	✓	n/a	n/a	n/a	✓	n/a
	Ongoing investigations where manner of death had not been assigned at the time of reporting	-	✓	n/a	✓	✓	n/a	✓	✓	n/a	-	-	✓	n/a

		BC	AB	SK	MB	ON	QC	NB	NS	PE	NL	YT	NT	NU
Suicide	Completed investigations	✓	✓ (INC)	✓	✓	✓	✓	✓	✓	n/a	✓	✓	✓	✓
	Ongoing investigations where the manner of death was believed to be suicide	✓	n/a	n/a	✓	-	n/a	✓	✓	n/a	n/a	n/a	✓	n/a
Deaths with completed investigations and an undetermined manner of death		✓	✓	✓	✓	✓	✓	✓	✓	n/a	✓	✓	✓	✓
Available data on origin of the opioid(s)														
2018	January to December	✓	✓	✓	n/a	✓	n/a	✓	✓	n/a	n/a	n/a	n/a	n/a
2019	January to December	✓	✓	✓	✓	✓	n/a	✓	✓	n/a	n/a	n/a	n/a	n/a
2020	January to December	✓	✓	✓	✓	✓	n/a	✓	✓	n/a	✓	n/a	n/a	n/a
2021	January to December	✓	✓	✓	✓	✓	n/a	✓	✓	n/a	✓	n/a	✓	n/a
2022	January to December	✓	✓	✓	✓ (INC)	✓	n/a	✓	✓	n/a	✓	n/a	✓	n/a
2023	January to June	✓	✓	✓	n/a	✓	n/a	✓	✓	n/a	✓	n/a	✓	n/a

✓ These data have been reported by the province or territory and are reflected in this update, unless otherwise specified.

(C) Data includes deaths with completed investigations only.

(INC) Data was not available for the entire period.

- The classification is not used in the province or territory.

n/a Data were not available at the time of this publication.

Table B. Types of opioids and stimulants

Category	Includes (but are not limited to):	
Fentanyl and fentanyl analogues	+ 3-methylfentanyl + acetylfentanyl + acrylfentanyl + butyrylfentanyl + carfentanil + crotonyl fentanyl + cyclopropyl fentanyl	+ despropionyl-fentanyl + fentanyl + fluoroisobutyrlfentanyl (FIBF) + furanylfentanyl + methoxyacetylfentanyl + norfentanyl
Non-fentanyl opioids	+ 2-methyl AP-237 + AH-7921 + AP-237 + brorphine + buprenorphine metabolites + codeine + desomorphine + dihydrocodeine + etodesnitazene + heroin + hydrocodone + hydromorphone + isopropyl-U-47700 + isotonitazene	+ loperamide + meperidine + methadone + metonitazene + mitragynine + monoacetylmorphine + morphine + MT-45 + normeperidine + oxycodone + tapentadol + tramadol + U-47700 + U-49900 + U-50488
Stimulants	+ amphetamine + atomoxetine + catha + cocaine + dexamfetamine + ethylphenidate + lisdexamfetamine + MDA + MDMA	+ mephedrone + methamphetamine + methylphenidate + modafinil + pemoline + phentermine + pseudoephedrine + TFMPP
Other psychoactive substances	+ alcohol + benzodiazepines + gabapentinoids + ketamine + LSD	+ PCP + psilocin + W-18 + Z-drugs