

January 2016 to June 2023



# Opioid and Stimulant Poisoning Hospitalizations

Surveillance of Opioid and  
Stimulant-Related Harms in Canada



Public Health  
Agency of Canada

Agence de la santé  
publique du Canada

Canada



# Technical Notes

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## Definitions

**Opioid-related poisoning hospitalization:** Acute care hospitalizations that recorded a significant diagnosis for opioid-related poisoning. Please see [Table A](#) for a list of diagnosis codes for opioid-related poisonings.

**Accidental opioid-related poisoning hospitalization:** An opioid-related poisoning hospitalization that is considered to be non-intentional in nature and is defined by a diagnostic “X42” ICD -10-CA code associated with any significant opioid-related poisoning codes (T40.0-T40.4 and T40.6, see [Table A](#) for more information).

**Intentional opioid-related poisoning hospitalization:** An opioid-related poisoning hospitalization that occurred as a result of purposely self-inflicted harm and is defined by a diagnostic “X62” ICD-10-CA code associated with any significant opioid-related poisoning codes (T40.0-T40.4 and T40.6, see [Table A](#) for more information).

**Undetermined opioid-related poisoning hospitalization:** An opioid-related poisoning hospitalization that is categorized by physician documentation of undetermined/unknown intent and is defined by a diagnostic “Y12” ICD-10-CA code associated with any significant opioid-related poisoning codes (T40.0-T40.4 and T40.6, see [Table A](#) for more information).

**Stimulant-related poisoning hospitalization:** Acute care hospitalizations that recorded a significant diagnosis for stimulant-related poisoning. Please see [Table B](#) for a list of diagnosis codes for stimulant-related poisonings.

**Accidental stimulant-related poisoning hospitalization:** A stimulant-related poisoning hospitalization that is considered to be non-intentional in nature and is defined by a diagnostic “X41” or “X42” ICD -10-CA code associated with any significant stimulant-related poisoning codes (T40.5 and T43.6, see [Table B](#) for more information).

**Intentional stimulant-related poisoning hospitalization:** A stimulant-related poisoning hospitalization that occurred as a result of purposely self-inflicted harm and is defined by a diagnostic “X61” or “X62” ICD-10-CA code associated with any significant stimulant-related poisoning codes (T40.5 and T43.6, see [Table B](#) for more information).

**Undetermined stimulant-related poisoning hospitalization:** A stimulant-related poisoning hospitalization that is categorized by physician documentation of undetermined/unknown intent and is defined by a diagnostic “Y11” or “Y12” ICD-10-CA code associated with any significant stimulant-related poisoning codes (T40.5 and T43.6, see [Table B](#) for more information).



## How poisoning hospitalizations are counted

Data on opioid- and stimulant-related poisoning hospitalizations are extracted from the Discharge Abstract Database (DAD), a national administrative database from the Canadian Institute for Health Information (CIHI) that compiles information on hospital discharges (including deaths, sign-outs, and transfers) from acute care institutions in all provinces and territories, except Quebec. CIHI receives the data directly from acute care facilities or from their health/regional authority or ministry/department of health. Data were accessed from the SAS grid managed by the Data Coordination and Access Program at the Public Health Agency of Canada (PHAC). Only inpatient hospitalizations from acute care facilities were included in the analyses.

Opioid and stimulant- related poisoning hospitalizations were identified as follows:

- + Poisoning diagnoses were based on the International Statistical Classification of Diseases and Related Health Problems, Tenth Revision, Canada (ICD-10-CA), which is used to code up to 25 diagnoses per hospital record, as it is the national standard for reporting morbidity. Refer to [Table A](#) for details on the ICD-10-CA codes used to identify opioid-related poisonings (T40.0-T40.4 and T40.6) and [Table B](#) for details on the ICD-10-CA codes used to identify stimulant- related poisonings (T40.5 and T43.6). Additional ICD-10-CA codes were used to classify the hospitalizations by intent.
- + Hospitalizations were included if the opioid or stimulant-related poisoning diagnosis was considered influential to the time spent and/or treatment received while in hospital, identified by diagnosis types "M" (most responsible diagnosis (MRD)), "1" (pre-admission comorbidity), "2" (post-admission comorbidity), and "W", "X", "Y" (service transfer diagnosis).
- + Hospitalizations where the diagnosis was considered questionable, as indicated by prefix code of "Q", were excluded.

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 hospitalizations / 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.

In April 2023, PHAC began leading the data analysis and preparation of this report. Prior to this, Health Canada was conducting the analysis and preparing the reports. PHAC and Health Canada access the data through two different applications, for which the data are updated at different frequencies. Values reported in June 2023 onward may be slightly different from historically reported values.



# Limitations of the data on poisoning hospitalizations

## General notes

1. The unit of observation for this analysis was a discharged inpatient hospitalization visit, rather than an individual patient. The time period reported is the calendar year in which a patient was discharged from the nursing unit of the reporting facility. The province or territory reflects the location of the reporting facility where the hospitalization occurred.
2. To facilitate comparisons over time as well as across jurisdictions, age-adjusted rates per 100,000 population per year were calculated using the latest population estimates from Statistics Canada.
3. Data on hospitalizations from Quebec are not included in the Discharge Abstract Database; subsequently, Quebec is excluded from these analyses.
4. Data from Yukon, Northwest Territories and Nunavut were combined due to small numbers.
5. Data collected through DAD or the ICD-10-CA codes do not specify how the opioids were obtained (e.g., illegally or through personal prescription); the level of toxicity may differ depending on the opioid (substance(s) involved, concentration, and dosage).
6. Data after March 31, 2023 are provisional and may be less complete and/or subject to change.

## Intention

7. Poisonings were further examined by the documented reason for the poisoning, based on ICD-10-CA diagnostic type "9" (external cause of injury), and classified into three categories: accidental, intentional, and undetermined/unknown.
8. Poisonings are classified as accidental unless there is clear documentation of intentional self-harm or undetermined intent.
9. When there was no documentation of intent, hospitalizations were excluded from analysis by intention, but were included in the total number of cases.

## Sex and age group

10. For most provinces or territories, data on the sex of the individual was based on biological characteristics or legal documentation. Data on hospitalizations where sex was categorized as "Other" were excluded from analyses by sex, but were included in the overall analyses. Data on hospitalizations where age group was categorized as "Unknown" were excluded from analyses by age group, but were included in overall analyses. Due to rounding, percentages may not add to 100%.



## Fentanyl and fentanyl analogues

11. Data on accidental opioid-related poisoning hospitalizations involving fentanyl or fentanyl analogues should be interpreted with caution as data on fentanyl-related poisoning hospitalizations became available starting April 1, 2018. As a result, fentanyl-related data presented for 2018 are limited to April to December. The ICD-10-CA classification codes to describe outcomes related to fentanyl and fentanyl analogues (“T40.40 – Poisoning by fentanyl and derivatives”) were used in data collection starting 2018-19 fiscal year, as they did not exist prior to that.

## Co-occurring non-opioid poisonings

12. Opioid-related poisoning hospitalizations were further examined for diagnoses of poisoning from one or more co-occurring non-opioid substance in the same hospital stay. Diagnoses for non-opioid substance-related poisoning were identified using ICD-10-CA codes and included poisonings from psychoactive substances. These codes were limited to diagnoses considered influential to the time spent/treatment received in hospital and cases where the diagnosis was considered questionable, as indicated by prefix code “Q”, were excluded. Co-occurring poisonings due to non-psychoactive substances (such as non-opioid analgesics, etc.) and anti-depressants were not included. Refer to [Table C](#) for details on ICD-10-CA codes used to identify non-opioid-related poisonings.

## Co-occurring non-stimulant poisonings

13. Stimulant-related poisoning hospitalizations were further examined for diagnoses of poisoning from one or more co-occurring non-stimulant substance in the same hospital stay. Diagnoses for non-stimulant substance-related poisoning were identified using ICD-10-CA codes and included poisonings from other substances. These codes were limited to diagnoses considered influential to the time spent/treatment received in hospital and cases where the diagnosis was considered questionable, as indicated by prefix code “Q”, were excluded. Refer to [Table D](#) for details on ICD-10-CA codes used to identify non-stimulant-related poisonings.

## Co-occurring non-stimulant/non-opioid poisonings

14. Stimulant and opioid -related poisoning hospitalizations were further examined for diagnoses of poisoning from one or more co-occurring non-stimulant/non-opioid substance in the same hospital stay. Diagnoses for non-stimulant/non-opioid substance-related poisoning were identified using ICD-10-CA codes and included poisonings from other substances. These codes were limited to diagnoses considered influential to the time spent/treatment received in hospital and cases where the diagnosis was considered questionable, as indicated by prefix code “Q”, were excluded. Refer to [Table E](#) for details on ICD-10-CA codes used to identify non-stimulant/non-opioid-related poisonings.



## Data suppression

Counts greater than zero and less than five have been suppressed as per CIHI privacy guidelines. 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.** List of diagnosis codes included for opioid-related poisonings

Code	Details
T40.0	Poisoning by opium
T40.1	Poisoning by heroin
T40.2	Poisoning by other opioids
T40.20*	Poisoning by codeine and derivatives
T40.21*	Poisoning by morphine
T40.22*	Poisoning by hydromorphone
T40.23*	Poisoning by oxycodone
T40.28*	Poisoning by other opioids not elsewhere classified
T40.3	Poisoning by methadone
T40.4	Poisoning by other synthetic narcotics
T40.40*	Poisoning by fentanyl and derivatives
T40.41*	Poisoning by tramadol
T40.48*	Poisoning by other synthetic narcotics not elsewhere classified
T40.6	Poisoning by other and unspecified narcotics

\*Introduced as of April 1, 2018

**Table B.** List of diagnosis codes included for stimulant-related poisonings

Code	Details
T40.5	Poisoning by cocaine
T43.6	Poisoning by psychostimulants with abuse potential (excl. cocaine)
T43.60**	Poisoning by methamphetamine with abuse potential
T43.68**	Poisoning by other specified psychostimulants with abuse potential
T43.69**	Poisoning by unspecified psychostimulants with abuse potential

\*\*Introduced as of April 1, 2022



**Table C.** List of diagnosis codes included for non-opioid poisonings co-occurring with opioid poisonings

Code	Details
T40.5	Poisoning by cocaine
T40.7	Poisoning by cannabis (derivatives)
T40.70**	Poisoning by cannabis (derivatives), edibles and ingestibles
T40.71**	Poisoning by synthetic cannabinoids
T40.79**	Poisoning by cannabis (derivatives), unspecified
T40.8	Poisoning by lysergide (LSD)
T40.9	Poisoning by other and unspecified psychodysleptics (hallucinogens)
T42.3	Poisoning by barbiturates
T42.4	Poisoning by benzodiazepines
T42.6	Poisoning by other antiepileptic and sedative-hypnotic drugs
T42.7	Poisoning by antiepileptic and sedative-hypnotic drugs, unspecified
T43.6	Poisoning by psychostimulants with abuse potential (excl. cocaine)
T43.60**	Poisoning by methamphetamine with abuse potential
T43.68**	Poisoning by other specified psychostimulants with abuse potential
T43.69**	Poisoning by unspecified psychostimulants with abuse potential
T43.8	Poisoning by other psychotropic drugs, not elsewhere classified
T43.9	Poisoning by psychotropic drug, unspecified
T44.9	Poisoning by other and unspecified drugs primarily affecting the autonomic nervous system
T51	Toxic effect of alcohol
T51.0	Toxic effect of ethanol
T51.1	Toxic effect of methanol
T51.2	Toxic effect of 2-propanol
T51.3	Toxic effect of fusel oil
T51.8	Toxic effect of other alcohols
T51.9	Toxic effect of alcohol, unspecified

\*\*Introduced as of April 1, 2022





**Table D.** List of diagnosis codes included for non-stimulant poisonings co-occurring with stimulant poisonings

Code	Details
T40.0	Poisoning by opium
T40.1	Poisoning by heroin
T40.2	Poisoning by other opioids
T40.20*	Poisoning by codeine and derivatives
T40.21*	Poisoning by morphine
T40.22*	Poisoning by hydromorphone
T40.23*	Poisoning by oxycodone
T40.28*	Poisoning by other opioids not elsewhere classified
T40.3	Poisoning by methadone
T40.4	Poisoning by other synthetic narcotics
T40.40*	Poisoning by fentanyl and derivatives
T40.41*	Poisoning by tramadol
T40.48*	Poisoning by other synthetic narcotics not elsewhere classified
T40.6	Poisoning by other and unspecified narcotics
T40.7	Poisoning by cannabis (derivatives)
T40.70**	Poisoning by cannabis (derivatives), edibles and ingestibles
T40.71**	Poisoning by synthetic cannabinoids
T40.79**	Poisoning by cannabis (derivatives), unspecified
T40.8	Poisoning by lysergide (LSD)
T40.9	Poisoning by other and unspecified psychodysleptics (hallucinogens)
T42.3	Poisoning by barbiturates
T42.4	Poisoning by benzodiazepines
T42.6	Poisoning by other antiepileptic and sedative-hypnotic drugs
T42.7	Poisoning by antiepileptic and sedative-hypnotic drugs, unspecified
T43.8	Poisoning by other psychotropic drugs, not elsewhere classified
T43.9	Poisoning by psychotropic drug, unspecified
T44.9	Poisoning by other and unspecified drugs primarily affecting the autonomic nervous system
T51	Toxic effect of alcohol
T51.0	Toxic effect of ethanol
T51.1	Toxic effect of methanol



Code	Details
T51.2	Toxic effect of 2-propanol
T51.3	Toxic effect of fusel oil
T51.8	Toxic effect of other alcohols
T51.9	Toxic effect of alcohol, unspecified

\*Introduced as of April 1, 2018

\*\*Introduced as of April 1, 2022

**Table E.** List of diagnosis codes included for non-stimulant/non-opioid poisonings co-occurring with opioid or stimulant poisonings

Code	Details
T40.7	Poisoning by cannabis (derivatives)
T40.70**	Poisoning by cannabis (derivatives), edibles and ingestibles
T40.71**	Poisoning by synthetic cannabinoids
T40.79**	Poisoning by cannabis (derivatives), unspecified
T40.8	Poisoning by lysergide (LSD)
T40.9	Poisoning by other and unspecified psychodysleptics (hallucinogens)
T42.3	Poisoning by barbiturates
T42.4	Poisoning by benzodiazepines
T42.6	Poisoning by other antiepileptic and sedative-hypnotic drugs
T42.7	Poisoning by antiepileptic and sedative-hypnotic drugs, unspecified
T43.8	Poisoning by other psychotropic drugs, not elsewhere classified
T43.9	Poisoning by psychotropic drug, unspecified
T44.9	Poisoning by other and unspecified drugs primarily affecting the autonomic nervous system
T51	Toxic effect of alcohol
T51.0	Toxic effect of ethanol
T51.1	Toxic effect of methanol
T51.2	Toxic effect of 2-propanol
T51.3	Toxic effect of fusel oil
T51.8	Toxic effect of other alcohols
T51.9	Toxic effect of alcohol, unspecified

\*\*Introduced as of April 1, 2022



## Disclosure

Parts of this material are based on data and information compiled and provided by CIHI. However, the analyses, conclusions, opinions and statements expressed herein are those of the authors, and not necessarily those of CIHI.

## Data Source

Discharge Abstract Database (DAD), Canadian Institute for Health Information, 2016 to 2023 (January-June)