



Methamphetamine

Key Points

- The prevalence of methamphetamine use in the Canadian population is low (~0.2%).
- Several jurisdictions report at least a three-fold increase in the use of methamphetamine over the past five years among individuals accessing treatment or harm reduction services.
- Notable increases for rates of criminal violations involving methamphetamine have been observed in the last five years (2013–2018).

Introduction

Methamphetamine is a synthetic drug classified as a central nervous system (CNS) stimulant or psychostimulant. CNS stimulants cover a wide range of substances that act on the body by increasing the level of activity of the CNS and include caffeine, nicotine, amphetamine (e.g., Adderall®), methylphenidate (e.g., Ritalin®), MDMA (“ecstasy”), cocaine (including crack cocaine) and methamphetamine (including crystal meth).^{1,2}

While both methamphetamine and amphetamine are psychostimulants and often grouped together, they are different drugs. A slight chemical modification of amphetamine produces methamphetamine, which has a different pharmacological profile that results in a larger release of certain neurochemicals in the brain and a stronger and more rapid physiological response. Some amphetamines are prescribed in Canada for attention-deficit hyperactivity disorder (ADHD) and narcolepsy (e.g., Adderall and Vyvanse®), but methamphetamine use is currently illegal.

Methamphetamine is often made in illegal, clandestine laboratories with commonly available, inexpensive chemicals, such as ephedrine and pseudoephedrine, found in medications, among other sources. The use of these medications as precursor chemicals for methamphetamine led to stricter regulations introduced in Canada in 2006, limiting access to them by requiring they be kept behind the counter of pharmacies.³ Illegal production can be dangerous due to the toxicity of the chemicals used and the high risk of explosions.

The drug is sold either as a powder (sometimes crystalline) or tablets, or in rock-like chunks or crystals, and also in a diverse array of colors.^{2,4} Depending on the form, methamphetamine can be snorted, injected, ingested or smoked. Street names for methamphetamine include:

- meth
- tina
- peach
- jib
- crystal meth
- crank
- pink
- pill
- crystal
- glass
- tweak
- blade
- ice
- chalk
- candy
- speed
- rock
- peanut



Effects of Methamphetamine

Short Term: Methamphetamine increases alertness, energy and self-confidence.^{2,5} When smoked or injected, methamphetamine use also produces a state of euphoria accompanied by higher energy and less fatigue, called a “rush” or “flash.” The high associated with methamphetamine use is mediated by increased levels of dopamine in the brain, a neurotransmitter associated with pleasure, movement and attention.¹ In contrast with cocaine, methamphetamine has a larger effect on dopamine levels in the brain, which results in stronger, more prolonged effects. Whereas 50% of cocaine is removed from the body within one hour, it takes 12 hours for 50% of methamphetamine to be removed from the body.⁶

Other physical effects of methamphetamine include decreased appetite, headache, dizziness, stomach pain, dry mouth and hyperthermia (elevated body temperature), and increased breathing, heart rate and blood pressure.^{2,5} Depending on the route of administration, the high from methamphetamine can last up to 12 hours.⁴

Long Term: When methamphetamine is used regularly over a long period, there is an increased risk for developing psychosis or psychotic symptoms.⁴ These symptoms include violent behaviour, paranoia, hallucinations and delusions, which pose risks and challenges to medical and healthcare professionals. People who use methamphetamine are prone to the sensation of insects crawling under or over their skin (“meth bugs”) and intense itching can lead to skin sores and lesions from scratching. Other effects include mood swings, insomnia and memory loss.⁵ Chronic methamphetamine use typically follows a “binge–crash” cycle where the drug is taken repeatedly for days (the binge) before withdrawal sets in (the crash). Symptoms of withdrawal from methamphetamine include fatigue, depression, anxiety and intense craving.⁵

In addition to neurological and behavioural effects, continued methamphetamine use is associated with physical effects from poor nutrition and lack of sleep, such as weight loss and respiratory diseases.⁶ Methamphetamine use during pregnancy is harmful to the fetus and increases risk for premature birth, low birth weight, and heart and brain abnormalities.⁷

Legal Status of Methamphetamine in Canada

Methamphetamine is classified as a Schedule 1 drug under the *Controlled Drug and Substances Act* (CDSA) with its use, production and distribution regulated under the CDSA.⁸ Methamphetamine production, possession, trafficking and import–export are illegal in Canada. Possession of methamphetamine can result in up to seven years imprisonment. Trafficking, importing, exporting or producing methamphetamine can lead to life imprisonment. Driving while impaired by methamphetamine is also a criminal offence under the *Criminal Code* of Canada, and some oral fluid drug screening devices or a blood or urine sample can be used to test for the presence of methamphetamine.⁹

Self-reported Use

Overall self-reported use of methamphetamine in Canada is low compared to other illicit drugs and has remained steady in the most recent years where data is available. However, among certain sub-populations, self-reported use has been increasing.*

* Past-year prevalence estimates are not available for each age category due to high sampling variability.



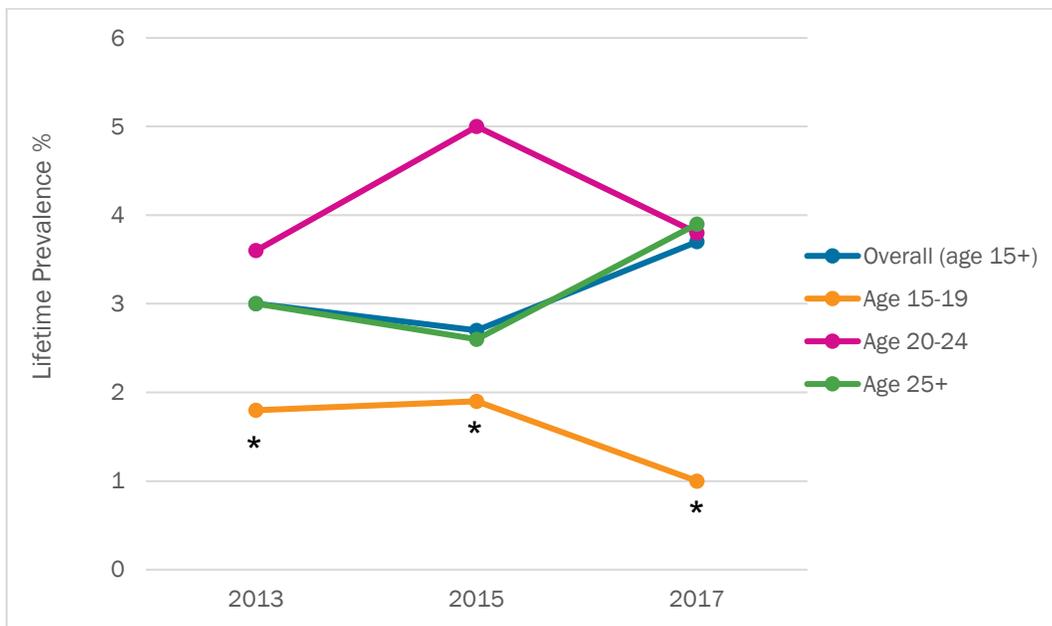
Past-year use in general population (age 15+): Data from the 2015 Canadian Tobacco, Alcohol and Drugs Survey (CTADS) show that approximately 0.2%[†] or 59,000 Canadians reported past-year use of methamphetamine.^{‡,10} This number remains unchanged from the 2013 CTADS survey.¹¹ An estimate for 2017 is not available due to high sampling variability.¹²

Lifetime use in general population (age 15+): Data from the 2017 CTADS survey indicate that 3.7% of Canadians have used methamphetamine at least once in their lifetime (Figures 1 and 2).¹² In 2017, lifetime prevalence was significantly higher among males (5.4%) compared to females (2.2%) (Figures 1 and 2).[†]

Lifetime use in adults (age 25+): Among Canadians 25 and older, 3.9% reported using methamphetamine at least once in their lifetime.¹²

Lifetime use in youth: In 2017, 1.0%[†] of youth aged 15–19 reported using methamphetamine[‡] at least once in their lifetime.¹² The proportion of youth aged 20–24 reporting lifetime use of methamphetamine was 3.8%.

Figure 1. Prevalence of self-reported lifetime methamphetamine use among Canadians, by age (2013–2017)



Source: CTADS 2013,¹¹ 2015, 2017.^{10,12}

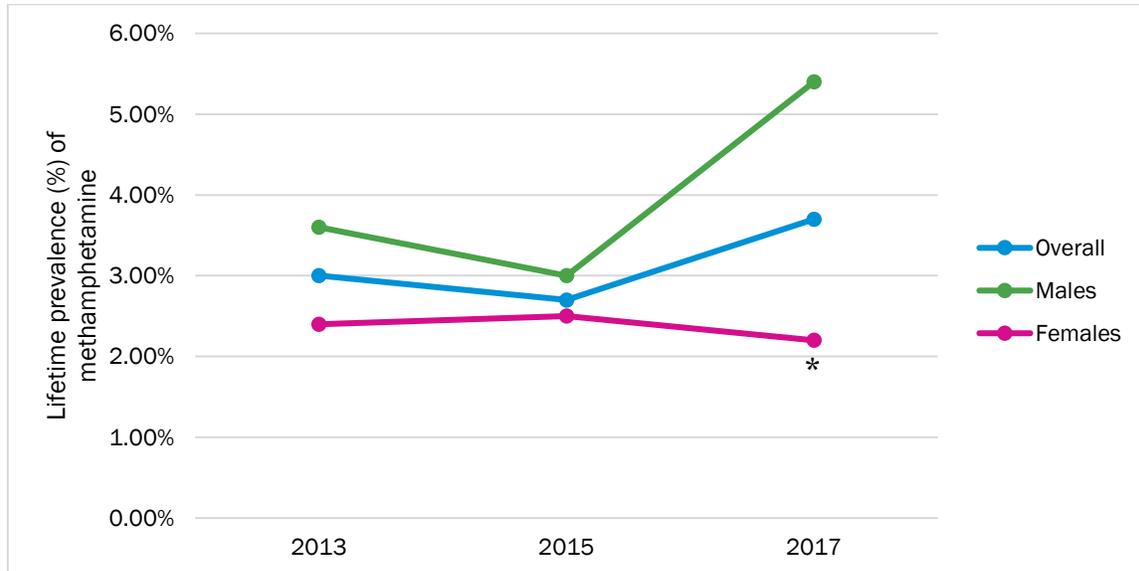
Note: Figures identified with an asterisk (*) should be interpreted with caution because of the small sample size.

[†] This number should be interpreted with caution due to moderate sampling variability.

[‡] CTADS estimates prevalence of past-year and lifetime use for “speed/methamphetamine/crystal meth.”



Figure 2. Prevalence of self-reported lifetime methamphetamine use among Canadians, by sex (2013–2017)



Source: CTADS 2013,¹¹ 2015,¹⁰ 2017¹²

Note: Figures identified with an asterisk (*) should be interpreted with caution because of the moderate sample size.

Past-year use in students (grades 7–12): Data from the 2018–2019 Canadian Student Tobacco, Alcohol and Drugs Survey (CSTADS) indicate that 1.3%[†] of Canadian students in grades 7–12 reported past-year use of amphetamines (including methamphetamine), which is similar to the data from the 2016–2017 survey (1.2%).^{§,13} Past-year prevalence for students in grades 10–12 (1.9%) was 2.7 times higher than students in grades 7–9 (0.7%).¹³ In Ontario, past-year methamphetamine use in 2017 was 0.6% in grade 9–12 students, a significant decrease from 6.3% in 1999.¹⁴

Post-secondary students: Data from the spring 2019 National College Health Assessment Survey, which is drawn from a convenience sample of 58 Canadian post-secondary institutions and therefore not representative of all post-secondary students in Canada, indicates that 98.2% of post-secondary students had never used methamphetamine; 1.4% had used it, but not in the past 30 days; and 0.4% had used methamphetamine sometime in the past 30 days.¹⁵

Gender: Among the general population (age 15+) in 2017, the prevalence of lifetime methamphetamine use among males (5.4%) was significantly higher than among females (2.2%).^{†,12} Among students (grades 7–12), the prevalence of past-year use among males in 2018–2019 was also significantly higher (1.6%) compared to past-year use among females (1%).¹³

First Nations: Data from the National Report of the First Nations Regional Health Survey show that past-year use of methamphetamine/crystal meth among First Nations in 2015–2016 (age 18+) was approximately 1.2%.¹⁶ Among First Nations youth aged 12–17, past-year use of methamphetamine/crystal meth in 2015–2016 was 0.6%.¹⁶

However, national survey data only tells part of the story. There is considerable variation across jurisdictions in rates of methamphetamine use. Problematic use tends to be concentrated among populations that are under-represented in national surveys. Although there are gaps in the available

§ CSTADS estimates prevalence of past-year for “speed, ice, meth.”

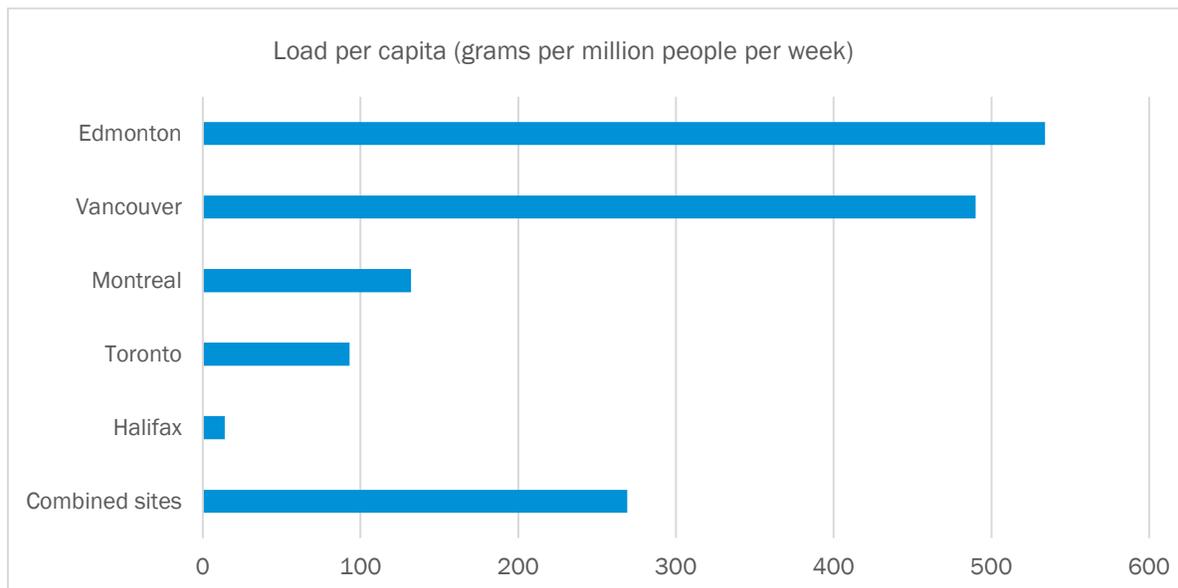


data, law-enforcement and healthcare indicators suggest that the availability, use and harms associated with methamphetamine have increased in the last five years in most provinces, particularly in the western provinces (British Columbia, Alberta, Saskatchewan and Manitoba). A CCSA-led, pan-Canadian, sentinel surveillance network made up of municipal, provincial and territorial representatives has also indicated that a recent increase in harms related to stimulants in Canada is predominantly associated with methamphetamine.¹⁷

Wastewater-based Estimates of Methamphetamine Use in Canada

The human organism is able to excrete large levels of unmetabolized methamphetamine, allowing for the detection of methamphetamine in wastewater systems. Methamphetamine concentrations in wastewater might parallel methamphetamine consumption patterns in a community. A pilot study by Statistics Canada collected wastewater in Canadian cities between March 2018 and February 2019. It revealed that methamphetamine levels in Halifax, Toronto and Montreal wastewater were low. ** In contrast, average methamphetamine levels for Edmonton and Vancouver wastewater were over 3.7 times higher than those in Montreal and Toronto (Figure 3).¹⁸ However, to validate these findings, wastewater data should be compared with data from other sources, such as data from the justice sector, public health, vital statistics or health administration.¹⁸

Figure 3 Wastewater-based estimates of methamphetamine in Canada (March 2018 to February 2019)



Source: Statistics Canada (2019)¹⁸

International Comparison

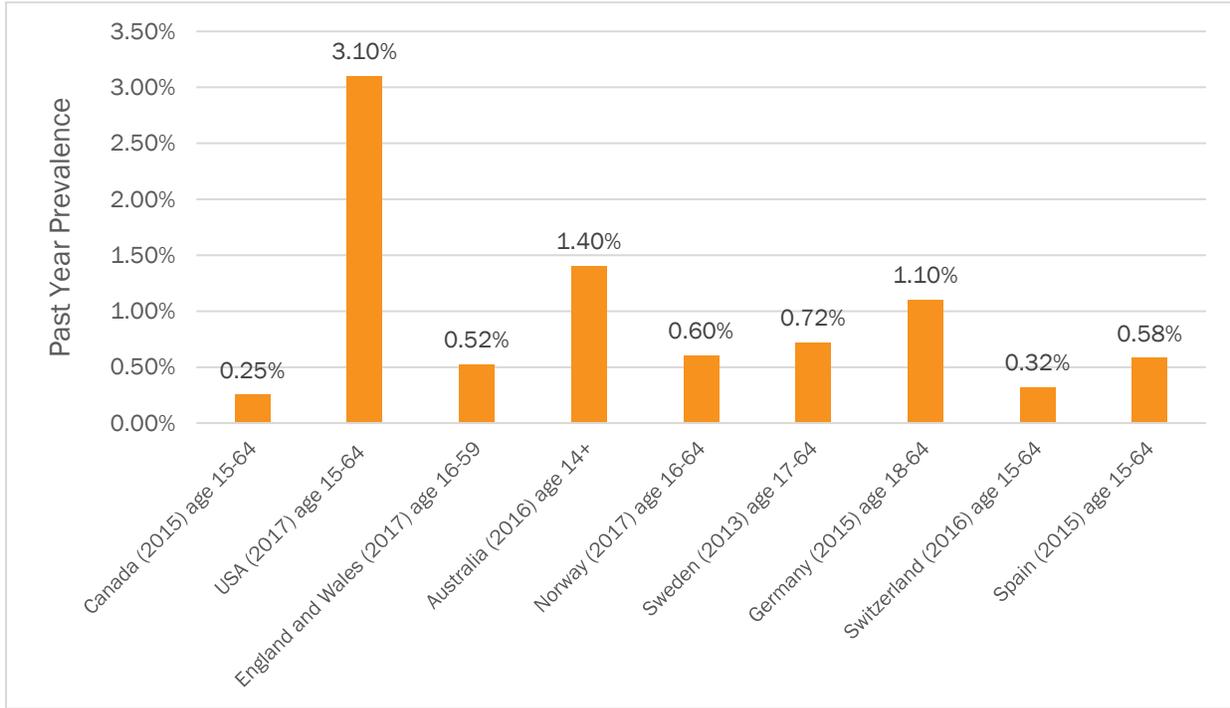
According to data obtained from the 2019 United Nations Office of Drugs and Crime, in 2017, past-year prevalence of amphetamine (including methamphetamine) use in Canada was estimated at

** A small number of other prescription drugs, such as Selegiline, Benzphetamine and Famprofazone, can also be converted into methamphetamine and found in wastewater. However, based on medication sales data from Health Canada, these drugs are expected to be found in small quantities representing less than 5% of the methamphetamine found in wastewater.



approximately 0.25 per cent of the population aged 15–64 which is lower than that in other select Western countries (Figure 4).¹⁹

Figure 4. Prevalence of self-reported past-year amphetamine and methamphetamine use among the general population by country



Source: United Nations Office on Drugs and Crime 2019¹⁹

Note: Prevalence estimates are for both amphetamine and methamphetamine.

Harms Associated with Use

Compared to other substances such as alcohol, there are limited data available specific to Canada on the harms associated with methamphetamine use. The estimated healthcare costs^{††} associated with CNS stimulants (not including cocaine) doubled from 51.16 million in 2007 to 107.38 million in 2014.²⁰

Impaired Driving

There are few national Canadian estimates for the prevalence of methamphetamine use while driving. Furthermore, it is difficult to isolate methamphetamine effects on driving as it is often categorized as within the broader class of CNS stimulants, which includes drugs such as cocaine and amphetamine.

Data from the National Fatality Database show that in Canada in 2015 among the 823 fatally injured drivers who were tested for drugs, 405 (49%) tested positive; of these drivers, over 27% tested

†† Healthcare costs include costs from inpatient hospitalizations, day surgeries, emergency department visits, specialized treatment events, physician time and prescription drugs.

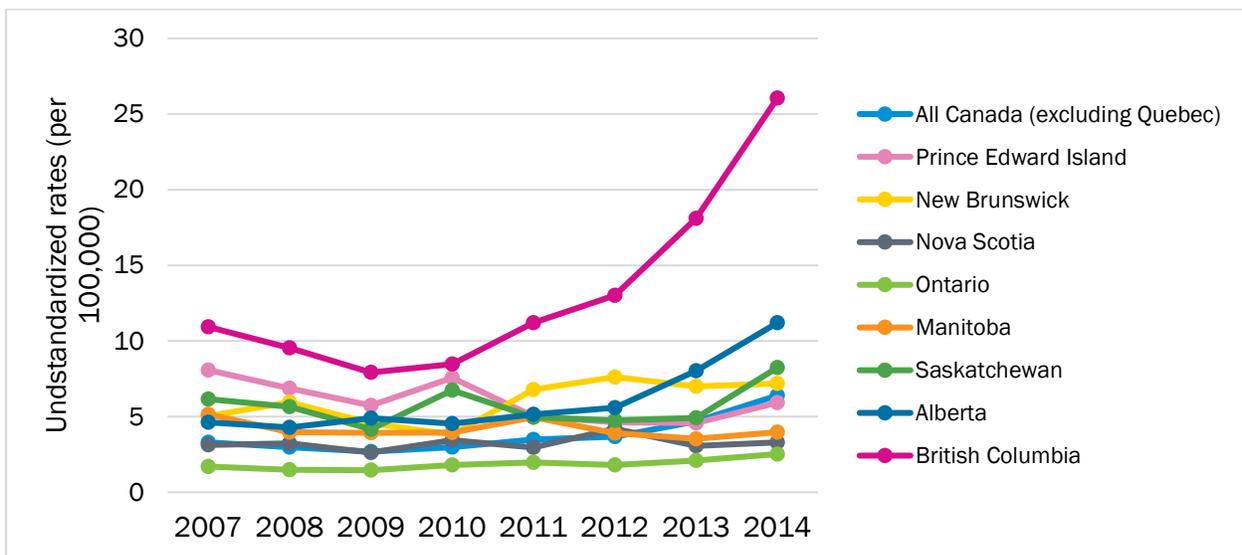


positive for CNS stimulants, such as cocaine, amphetamine and methamphetamine.^{‡‡, 21} A 2018 roadside survey conducted in British Columbia showed that 36.1% of drug-positive drivers tested positive for stimulants, such as cocaine and amphetamine, while 70.5% tested positive for cannabis and 6.0% tested positive for opioids.^{§§, 22} Another roadside survey conducted in five regions across Ontario in 2017 evaluated the prevalence of alcohol and drug use among night-time drivers. The survey showed that 17.8% of the drug-positive drivers tested positive for stimulants such as cocaine and methamphetamine, while 82.1% tested positive for cannabis and 13.4% for opioids.²³

Inpatient Hospitalizations

Inpatient hospitalizations due to CNS stimulants, including methamphetamine, increased across several Canadian jurisdictions between 2007 and 2014 (Figure 5).²⁰ More specifically, between 2012 and 2014, hospitalization rates in British Columbia and Alberta doubled, while an increase of approximately 70% was observed in Saskatchewan and across Canada as a whole (excluding Quebec). Although these hospitalizations include other stimulants besides methamphetamines, data from other sources suggest that these increases are largely driven by an increase in harms associated with methamphetamine use.

Figure 5. Rate of inpatient hospitalizations attributable to CNS stimulants (excluding cocaine) among selected jurisdictions and Canada (excluding Quebec) (2007–2014)



Source: Canadian Substance Use Costs and Harms Scientific Working Group (2019)²⁰

An analysis by the Canadian Institute for Health Information shows that in 2017–2018, hospitalization rates for harm caused by stimulants (including methamphetamine) for Canadians aged 10+ were 11.2% (of all hospital stays for harms caused by substance use), with the highest rates recorded for British Columbia, Saskatchewan and New Brunswick (16.1%, 14.7% and 14.6%, respectively).²⁴ More specifically, among youth aged 10–24, hospitalization rates for harm caused by stimulants (including methamphetamine) were 60 per 100,000 people, with the highest rates recorded in the 18–24 age range (97 per 100,000).²⁵

‡‡ Data are collected by the Traffic Injury Research Foundation from coroner and medical examiner files containing results of alcohol and drug toxicological blood tests of fatally injured drivers.

§§ Presence of drugs were detected in oral fluid samples from drivers and subsequently tested in a toxicology laboratory.



- In Winnipeg, emergency room visits related to methamphetamine use have increased from 10 visits in January 2013 to 180 visits in December 2017, an increase of 1,700%.²⁶
- In Vancouver, a prospective cohort study of 1,216 street-involved youth (aged 14–26) conducted from 2005 to 2016 did not find daily crystal meth use during the six months preceding the analysis to be associated with increased hospitalization rates.²⁷

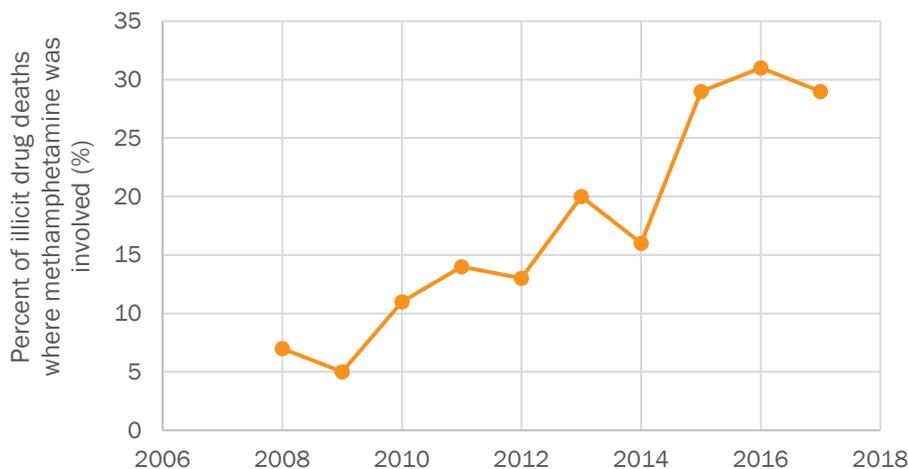
Methamphetamine-related Deaths

Currently, no national-level statistics quantify the number of deaths attributable only to methamphetamine in Canada. Some provincial jurisdictions provide statistics for deaths where methamphetamine was detected in an illicit drug overdose death, although for these data, it is not known whether methamphetamine was the primary cause or a contributor to death.

British Columbia

- Amphetamine or methamphetamines were detected in 33% of illicit drug overdose deaths between 2016 and 2019.²⁸ This proportion has increased from approximately 8% in 2008 to 29% in 2017 (Figure 6).²⁹

Figure 6. Proportion of illicit drug deaths in B.C. where methamphetamine was involved (2008–2017)



Source: B.C. Coroner's Service, 2019.²⁹

Alberta

- Approximately 42% of all fentanyl-poisoning deaths in 2017 had methamphetamine listed as a contributing factor, compared to 32% for cocaine and 23% for heroin.³⁰
- The proportion of fentanyl poisonings involving methamphetamine was 2.6 times higher in 2017 (42%) compared to 2015 (16%).³⁰

Manitoba

- Between 2016 and 2017, the number of deaths where methamphetamine was detected doubled (16% to 27%).²⁶



Ontario

- In preliminary data provided by the Office of the Chief Coroner for Ontario, methamphetamine contributed to 14% of accidental fentanyl-related deaths across the province between May 2017 and March 2018. The number of Ontario deaths where methamphetamine either directly caused the death or was one of the drugs causing lethal toxicity has increased, with 14 deaths in 2012 rising to 217 deaths in 2017 (preliminary figures).¹⁷

Access to Treatment and Harm Reduction Services

Although data is lacking for harm reduction service indicators, several jurisdictions across Canada report an increase over the past five years in the use of methamphetamine among individuals accessing these services.

British Columbia

- The B.C. Centre for Disease Control has surveyed clients at harm reduction sites across the province, with the most recent cycle of the survey in 2018.³¹ Survey results indicated that the most commonly reported illicit substance used in the past seven days was crystal methamphetamine (69%), reflecting an increase since the last survey in 2015 (47%).³²
- Other data sources, including Vancouver drug users surveys (the Vancouver Injection Drug Users Study, the AIDS Care Cohort to Evaluate Access to Survival Services and the At-Risk Youth Study), have shown trends of crystal methamphetamine use increasing.¹⁷

Alberta

- The proportion of clients reporting crystal methamphetamine use when accessing services provided by Alberta Health Services' Addiction and Mental Health division has nearly tripled from 2011–2012 to 2015–2016.¹⁷

Saskatchewan

- The prevalence of methamphetamine usage reported at admission to addictions programs increased from 5% in 2009–2010 to 25% in 2015–2016.³³

Manitoba

- Among adult clients accessing services provided by the Addictions Foundation of Manitoba, reported past-year methamphetamine use increased from 9% in 2014–2015, to 24% in 2018–2019 (to date), with use more prevalent among females.¹⁷

Ontario

- In 2016–2017, methamphetamine replaced alcohol as the third most commonly used substance by harm-reduction clients in Ontario who accessed services from a variety of provincial, community-based and capacity-building programs.³⁴
- The Drug and Alcohol Treatment Information System also reported an increase in the proportion of individuals seeking treatment for methamphetamine use in Ontario, from 2.13% in 2012–2013, to 8.3% in 2016–2017.³⁵



Quebec

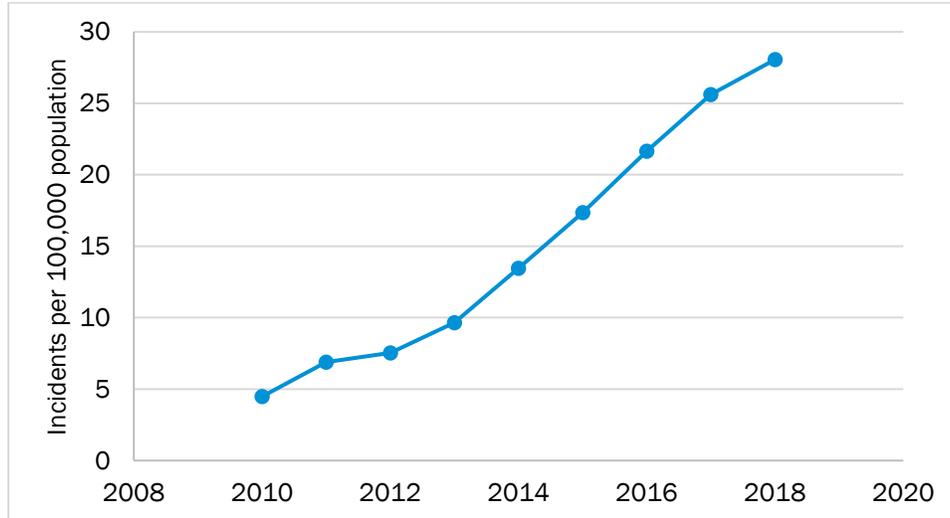
- The SurvUDI Network monitors injection drug use at eight locations in the province of Quebec and the city of Ottawa. The proportion of respondents who reported injecting stimulants other than cocaine or crack, including amphetamines and methamphetamine, at least once in the past six months had increased from 5% in 2004 to 14% in 2016.¹⁷

Criminal Justice Impacts

Frequent methamphetamine use can cause violent behaviours, paranoia and psychosis, which can contribute to increased risk for committing violent crimes and increased crime-related costs.³⁶ For instance, in 2014 the estimated costs of CNS stimulants, including methamphetamine, to the criminal justice system were \$575 million.²⁰

In 2010–2018, incident-based crime statistics provided by Statistics Canada highlight significant increases for rates of methamphetamine violations including for possession (626%), trafficking (339%) and importation/exportation (4,200%), and a slight increase for production (107%) (Figures 7 and 8).³⁷ Similar to other illicit drugs, the greatest proportion of offences were due to possession of methamphetamine (28.1 per 100,000).³⁷ Higher rates of possession violations do not necessarily reflect higher rates of prevalence, and will depend on differential approaches to enforcement within a jurisdiction. In 2018, western provinces generally recorded the highest rates of methamphetamine possession and trafficking violations (Figure 9).³⁷

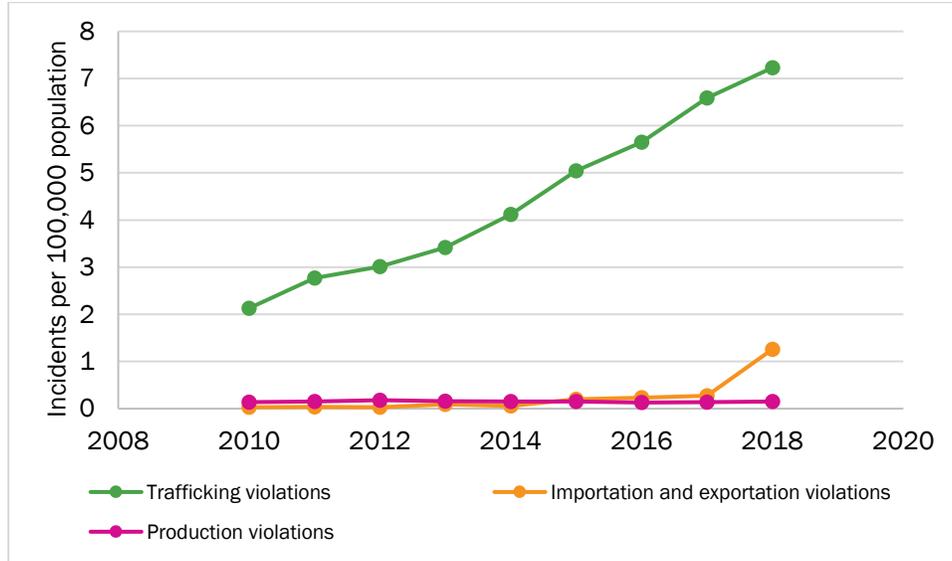
Figure 7. Methamphetamine possession violations (per 100,000) across Canada (2010–2018)



Source: Statistics Canada, 2019.³⁷

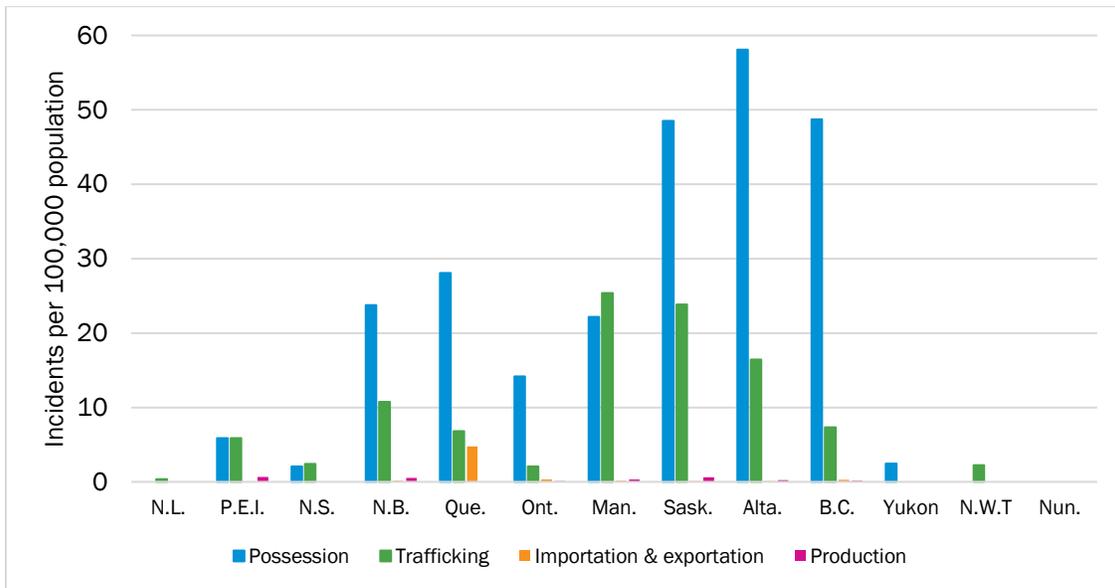


Figure 8. Rate of other methamphetamine violations (excluding possession) across Canada (2010–2018)



Source: Statistics Canada, 2019.³⁷

Figure 9. Rate of methamphetamine violations by province and territory (2018)



Source: Statistics Canada, 2019.³⁷

Methamphetamine Seizures in Canada

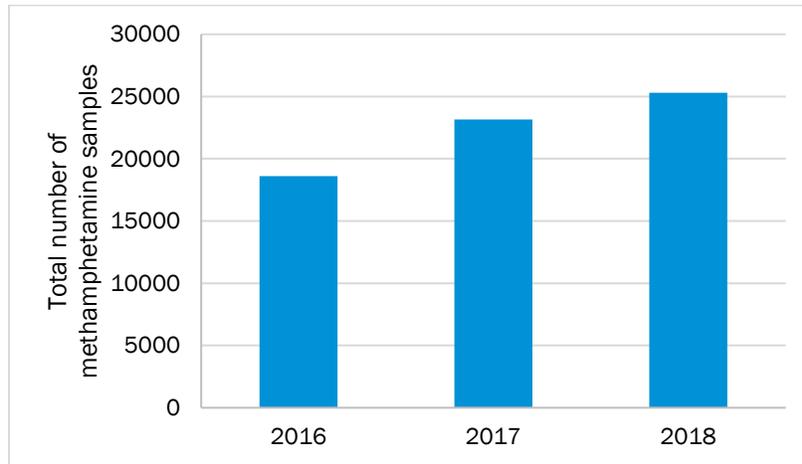
National

The United Nations Office on Drugs and Crime reported that in 2017, 379 kilograms of methamphetamine were seized in Canada, an increase of about 186% from 2015.³⁸ The Drug



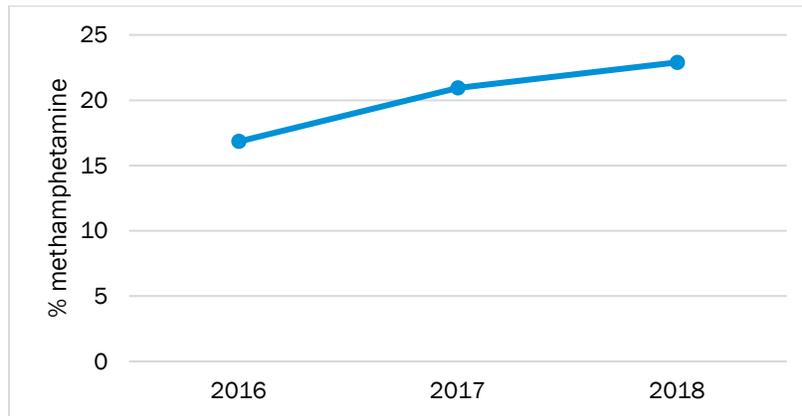
Analysis Service^{***} reported that the total number of methamphetamine samples identified increased 136% from 18,611 in 2016 to 25,314 in 2018 (Figure 10).^{39, 40} In 2018, methamphetamine made up approximately 23% of the top 10 controlled substances identified from analyses,^{†††} an increase from 17% in 2016 (Figure 11).⁴⁰ In 2018, methamphetamine represented at least 25% of samples of the top 10 controlled substances in most provinces (Figure 12). From 2016 to 2018, methamphetamine was the third most commonly identified substance seized by Canadian law enforcement agencies, after cannabis and cocaine.^{39, 40, 41}

Figure 10. Total number of methamphetamine samples identified in Canada (2016–2018)



Source: Drug Analysis Service 2017,³⁹ 2018,⁴¹ 2019.⁴⁰

Figure 11. Proportion (%) of samples^{†††} containing methamphetamine (2016–2018)



Source: Drug Analysis Service 2017,³⁹ 2018,⁴¹ 2019.⁴⁰

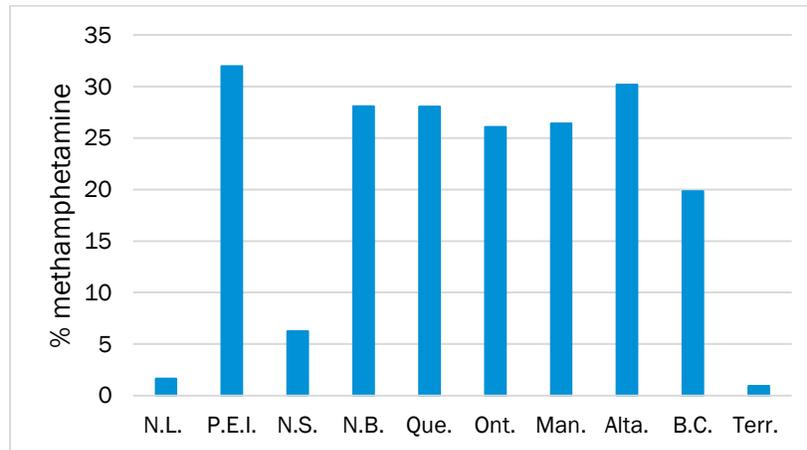
^{***} The Drug Analysis Service analyzes suspected illegal drugs seized by Canadian law enforcement agencies and submitted to the service for analysis. The drugs analyzed do not represent the total number of substances seized by law enforcement and should not be used to estimate the number or types of drugs available on the street. Note that a single sample may contain more than one substance.

^{†††} Note that cannabis is included and was the most commonly controlled substance identified for 2016, 2017 and 2018.

^{‡‡‡} Proportion of top 10 controlled substances identified from analyses, not proportion of all samples analyzed.



Figure 12. Proportion (%) of samples^{§§§} containing methamphetamine by jurisdiction (2018)



Source: Drug Analysis Service, 2019.⁴⁰

Provincial and Municipal Jurisdictions

Increases in methamphetamine seizures have also been reported in other jurisdictions where data is available.

- The number of methamphetamine exhibits^{****} seized by the Vancouver Police Department increased by 293% from 2011 to 2013 from a total of 258 to 757. The weight in overall grams of these seizures also increased from 1,356 in 2010 to 31,491 in 2013.⁴²
- The Alberta Law Enforcement Response Team reported that methamphetamine valued at \$3,970,783 accounted for approximately 40% of drugs seized by the team across the province in 2017–2018.⁴³ Methamphetamine seizures in Medicine Hat increased from 369 grams in 2015 to 3,207 grams in 2017, an increase of almost 870%.

International

The 2019 *World Drug Report* indicated that global quantities of methamphetamine seized in 2017 increased for a fifth consecutive year at 16%.¹⁹ Methamphetamine represents the largest quantity of amphetamine-type stimulants seized globally with 66% of the total quantity of amphetamine-type stimulants seized over the period 2013–2017, followed by amphetamine (26%) and ecstasy (5%).¹⁹ Globally, 49% of methamphetamine seizures occurred in North America over the period 2013–2017.

Methamphetamine Manufacturing in North America

Member States of the United Nations have identified 50 possible countries of origin for methamphetamine manufacturing.¹⁹ Over the period 2013–2017, about 35,000 clandestine methamphetamine laboratories were dismantled in 31 countries.¹⁹ Ninety per cent of these laboratories were dismantled in North America (mostly in the United States, followed by Mexico and Canada), and were mainly “kitchen labs” manufacturing methamphetamine for the “local market.”¹⁹ This indicates an expansion of the methamphetamine market in North America.

§§§ Proportion of top 10 controlled substances identified from analyses, not proportion of all samples analyzed.

**** Drug samples seized by law enforcement agencies.



Additional Resources

- [Cocaine \(Canadian Drug Summary\)](#)
- [Prescription Stimulants \(Canadian Drug Summary\)](#)
- [Stimulants, Driving and Implications for Youth \(Topic Summary\)](#)
- [Methamphetamine in Canada \(Infographic\)](#)
- [Presentation on the Impacts of Methamphetamine Use in Canada to the House of Commons Standing Committee on Health \(Speaking Notes\)](#)
- [Changes in Stimulant Use and Related Harms: Focus on Methamphetamine and Cocaine \(CCENDU Bulletin\)](#)



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