Stimulants in the wastewater of Canadian cities: provisional results, January 2022 to May 2023

Released at 8:30 a.m. Eastern time in The Daily, Wednesday, November 1, 2023

Stimulant drug use is reported to be contributing significantly to accidental drug toxicity deaths in Canada. In fact, as drug overdoses increased by more than 30% from 2020 to 2021, the latest report from the Public Health Agency of Canada on Opioid- and Stimulant-related Harms in Canada indicates that approximately half of apparent accidental opioid toxicity deaths also involved a stimulant.

Stimulants include controlled drugs like cocaine ("coke"), methamphetamine ("crystal meth"), MDMA ("ecstasy") and amphetamines ("speed" or "uppers"). Amphetamines are also available by prescription to treat conditions such as attention deficit/hyperactivity disorder (ADHD).

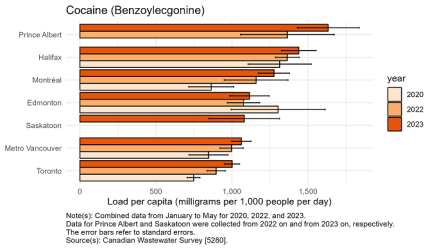
Amphetamine measured in wastewater had increased significantly prior to 2023 in certain Canadian cities. However, early results in 2023 suggest that amphetamine levels may have stabilized. On the other hand, cocaine levels have continued to increase into 2023.

These observations are based on new data released today from the Canadian Wastewater Survey (CWS). The CWS has regularly been collecting wastewater samples from several municipalities across the country since 2019 to test for various drugs, including stimulants. The release today includes new data for 2022 as well as provisional data for the months of January, March, and May 2023 as part of Statistics Canada's commitment to more timely and relevant data. Wastewater-based estimates of drug use have traditionally been used to assess longer-term trends, for example year-to-year comparisons. However, in the context of an ongoing drug crisis in some parts of Canada, wastewater data can provide nearly real-time information which contributes to a better understanding of current drug use and emerging trends. This information can help inform more targeted public health responses and law enforcement activities.

Cocaine use continuing to show signs of increase across Canada

In most municipalities, cocaine levels increased from January to May 2022 compared with the same period in 2020 (Infographic 1). Provisional results from 2023 also suggest the trend of increasing levels of cocaine use continues in most municipalities.

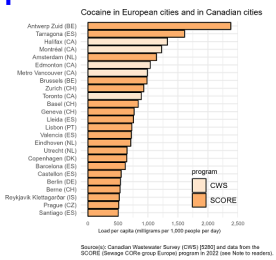
Infographic 1 – Combined cocaine (benzoylecgonine) daily load per capita for Halifax, Montréal, Toronto, Saskatoon, Prince Albert, Edmonton, and Metro Vancouver from January to May in 2020, 2022, and 2023



Wastewater monitoring for drug use has been ongoing in cities across the globe for many years. For example, the European Monitoring Center for Drugs and Drug Addiction monitors wastewater in over 150 cities across 28 countries across the continent. Compared with the European cities included in their analysis, with populations of more than 100,000 people, 5 Canadian cities would rank among the top 10 with the highest levels of

cocaine in wastewater (Infographic 2). The United Nations 2023 Global Report on Cocaine indicates that half a million Canadians reported using cocaine in 2022 and that cocaine is highly available in Canada. Moreover, Canada had a lower retail price for cocaine than many other countries.

Infographic 2 – Cocaine in European cities and in Canadian cities



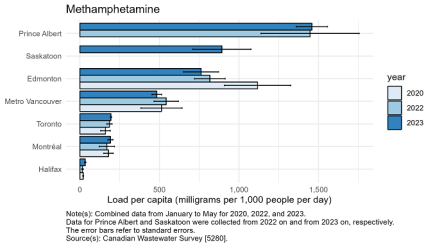
Canadian cities also displayed very large levels of methamphetamine ("crystal meth") compared with cities in other countries worldwide. Among countries with available wastewater data that use comparable methodology, cities in the United States, Czechia, Australia, Canada, and New Zealand had the highest levels of methamphetamine use in 2022.

Methamphetamine has not shown signs of increased use in recent years, while amphetamine levels showed a marked increase from 2020 to 2022

Methamphetamine is a stimulant drug that is both potent and highly addictive. Amphetamine is a metabolite in the breakdown of methamphetamine which implies that methamphetamine use contributes very significantly to amphetamine levels in wastewater.

Although methamphetamine use in Canada in 2022 was higher compared with some international cities, use in Canada has not changed significantly in recent years (Infographic 3).

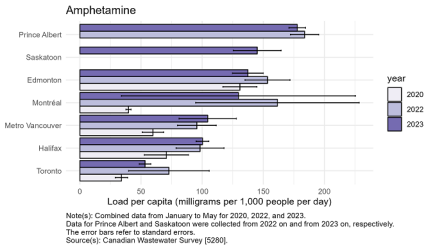
Infographic 3 – Combined methamphetamine daily load per capita for Halifax, Montréal, Toronto, Saskatoon, Prince Albert, Edmonton, and Metro Vancouver in the months January to May in 2020, 2022, and 2023



On the other hand, average wastewater levels of amphetamine were significantly higher in the first half of 2022 compared with the same time in 2020 in Montréal and other cities such as Toronto and Metro Vancouver (Infographic 4). Average levels in the first half of 2022 were also higher in Halifax, though the difference was not as large. As these increased levels of amphetamine in wastewater do not correspond with an increase in methamphetamine levels, this implies there was an increased use of amphetamine and other amphetamine-related drugs, which could include medications used for ADHD. Further research is needed to better understand whether this is primarily from increased prescription or illicit amphetamine drug use (i.e., recreational and other non-medical uses).

So far in 2023, there were not large differences in methamphetamine or amphetamine levels compared with 2022.

Infographic 4 – Combined amphetamine daily load per capita for Halifax, Montréal, Toronto, Saskatoon, Prince Albert, Edmonton, and Metro Vancouver in the months January to May in 2020, 2022, and 2023



Methamphetamine, amphetamine use highest in cities in the Prairies

On average, both methamphetamine and amphetamine levels have been consistently higher in cities in the prairies (Edmonton, as well as Prince Albert and Saskatoon) compared with the other cities participating in the CWS. Prince Albert had the highest average levels for January to May in 2022 and 2023.

Note to readers

The table published today includes the monthly estimates of average daily load per capita for 10 substances of interest in 7 Canadian cities (Metro Vancouver, Edmonton, Toronto, Montréal, Halifax, Prince Albert (Saskatchewan), and Saskatoon) totalling nearly 9 million people. The substances include stimulants (cocaine, measured through its metabolite benzoylecgonine, amphetamine, methamphetamine, and ecstasy), opioids (codeine, fentanyl, measured through its metabolite norfentanyl, methadone, morphine, oxycodone), and cannabis, measured through its metabolite THC-COOH.

Wastewater samples were collected from the influent of wastewater treatment plants for seven consecutive days during the second week of every month. The daily samples were analyzed at the Health Canada Regulatory Operations and Enforcement Branch laboratory in Toronto. Laboratory results and population estimates for each region were then combined to estimate the daily average of drug loads per capita for each month in each municipality.

It is important to note that there can be a lot of variation from month to month for a given drug. That is why the results in today's article are presented as averages for the months between January and May for each year. With only a few months of data available in 2023 so far, sudden changes could indicate a new trend in drug consumption, but there are many other factors that can influence the results for a given month. That is, there are important limitations in the analysis and interpretation of estimates from wastewater samples (many of which have been previously described in the report "Wastewater-based estimates of cannabis and drug use in Canada: Pilot test detailed results"). As such, these results should be interpreted with caution. Some of the measured values may include measurement errors that lead to wrongly quantifying the drug levels. The effects of certain other factors, such as differences in the size and configuration of sewer shed systems, or the stability of the drugs in the wastewater and in the stored samples, may affect the comparability of the results and they are still being investigated. Furthermore, it should also be noted that raw numbers are not directly comparable between 2020 and 2022 due to a change in analytical methodology in the lab. However, despite the modification of the experimental protocols, the observed differences are large enough to indicate a considerable increase in amphetamine use since 2020.

It should be noted that some of the measured loads reflect levels of the parent drugs and not the exclusive metabolites. This introduces additional challenges in measuring changes in levels that are strictly due to consumption since it is possible for the load of the drug in wastewater to be elevated due to discharges from drug manufacturing or dumping, or to the consumption of a similar drug.

International comparisons in this report come from the Sewage CORe group Europe (SCORE), Australia's National Wastewater Drug Monitoring Program, and New Zealand's Institute of Environmental Science and Research and the National Drug Intelligence Bureau. Some caution should be used when interpreting these results as the European SCORE estimates are based on just one month in 2022.

Available tables: table 13-10-0871-01.

Definitions, data sources and methods: survey number 5280.

For more information, or to enquire about the concepts, methods or data quality of this release, contact us (toll-free 1-800-263-1136; 514-283-8300; **infostats@statcan.gc.ca**) or Media Relations (**statcan.mediahotline-ligneinfomedias.statcan@statcan.gc.ca**).