



Canadian Community
Epidemiology Network
on Drug Use



Canadian Centre
on Substance Use
and Addiction

Substance Use Trends in Canada

No. 2: September 2024

Medetomidine

The [Canadian Community Epidemiology Network on Drug Use \(CCENDU\)](#), co-ordinated by the Canadian Centre on Substance Use and Addiction (CCSA), publishes this newsletter regularly to inform people living in Canada about emerging substance use issues and trends, pulling from the best available information sources at the time of publication.

Medetomidine is a veterinary tranquilizer approved for surgical use in animals but not humans. A related compound, dexmedetomidine is approved for medical use in humans. Both act on the body's adrenalin system, causing sedation and pain relief. Their mechanism and effects are similar to [xylazine](#) but stronger and longer lasting.

Medetomidine and possibly dexmedetomidine are increasingly being detected in the unregulated drug supply. Distinguishing the two can be difficult using available technologies. Resources may refer to "medetomidine/dexmedetomidine" in recognition of this. However, people working in the field now believe primarily medetomidine is being detected. For this reason, we only refer to medetomidine in this newsletter.

Concerns about medetomidine are similar to those of xylazine, including:

- Medetomidine is being found in drugs expected to be opioids, often in combination with fentanyl, its analogues and other tranquilizers. These combined sedatives can enhance sedation and decrease blood pressure, breathing and heart rate to dangerous levels.
- Medetomidine is not an opioid, so naloxone does not reverse its effects. However, [one case report](#) has been identified that suggests high doses of naloxone may reverse the effects of dexmedetomidine.
- Naloxone is recommended in all cases of suspected opioid poisoning to reverse the harmful effects of any opioids that may have been consumed. However, sedation from medetomidine may continue after naloxone has been given.
- Unlike xylazine, exposure to medetomidine has not been linked to skin infections nor wounds.



Key Trends and Take-Aways

- Medetomidine detection first increased sharply in the unregulated supply in Ontario and Quebec in early 2024, and more recently in British Columbia.
- Healthcare professionals, service providers and people who use drugs need to know about the strong sedative effects of medetomidine and the complications it creates for reversing drug poisonings (refer to the resource list at the end of this newsletter).
- Responses should focus on addressing the combined presence of multiple sedatives in drugs expected to be opioids, which together increase the risk of drug poisoning.

Reports from CCENDU Sites

CCENDU is a pan-Canadian network of community partners with sites in British Columbia, Manitoba, Thunder Bay, Toronto, Quebec, Nova Scotia, and Newfoundland and Labrador. Each site collects information from their local partners and networks about substance-related trends and response options.



01 — British Columbia

BC Centre for Disease Control

The site leads became aware of medetomidine through drug checking in the Vancouver Coastal Health region in July 2024. Samples varied in form (i.e., pebbles, chunks) and colour (i.e., red, blue, purple, green). Samples have also contained fentanyl, its analogues and sometimes benzodiazepines (refer to the drug checking section). Several samples were associated with drug poisonings. Responses have included issuing drug alerts and raising



awareness of key concerns, including enhanced sedative effects and extremely toxic effects in children and youth.

02 — Alberta

Independent Collaborators

CCENDU collaborators first reported the presence of medetomidine in June 2024. Samples containing medetomidine were powders, grainy substances or both. They also always contained fentanyl and caffeine. Medetomidine has not been linked to drug toxicity events, but that may be due to a lack of awareness of its presence. Among the responses, Alberta Law Enforcement Response Teams have circulated a bulletin with information on medetomidine's adverse effects and guidance on how to respond to toxicity events.

03 — Ontario

Toronto Public Health

Toronto's Drug Checking Service first reported detection of medetomidine to Toronto Public Health in January 2024. Samples containing medetomidine also contained fentanyl, its analogues and other central nervous system depressants (refer to the drug checking section). Some have resulted in a drug poisoning. Responses include standard harm reduction messaging and a memo issued by Toronto's Drug Checking Service raising awareness of the potency and sedative effects of medetomidine.

Thunder Bay Drug Strategy

The site leads are not aware of medetomidine in their region.

04 — Quebec

Institut national de santé publique du Québec

The Institut national de santé publique du Québec first became aware of medetomidine detection in February 2024, co-detected with fentanyl or its analogues. The site leads are unaware of associated adverse health effects.

Detection in Seized Drugs

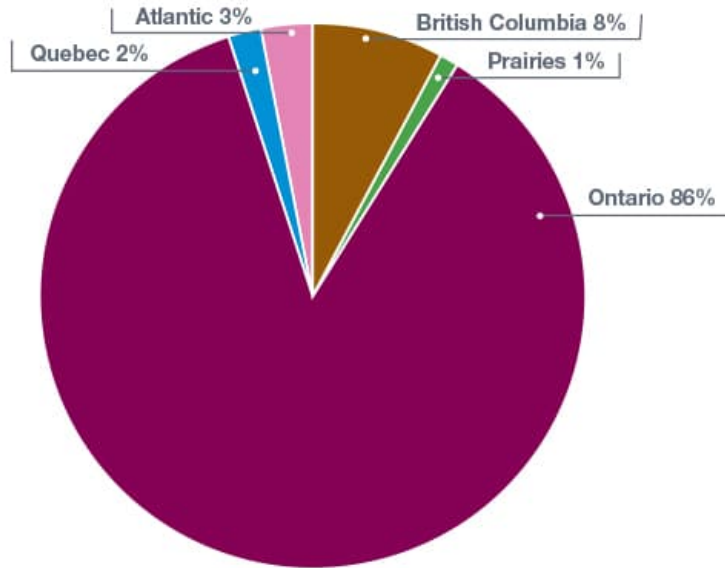
Prevalence of substances in the unregulated drug supply can be estimated from [Health Canada's Drug Analysis Service \(DAS\)](#), which analyzes the content of substances seized and submitted by law enforcement agencies. More information about the DAS's work can be found [online](#).

Between January 1, 2023, and July 31, 2024, a total of 924 samples analyzed by DAS contained medetomidine.

Most of these samples were submitted from Ontario. Other samples came from British Columbia, the Atlantic provinces, Quebec and the Prairies. Medetomidine was not detected in any samples submitted by the Territories.



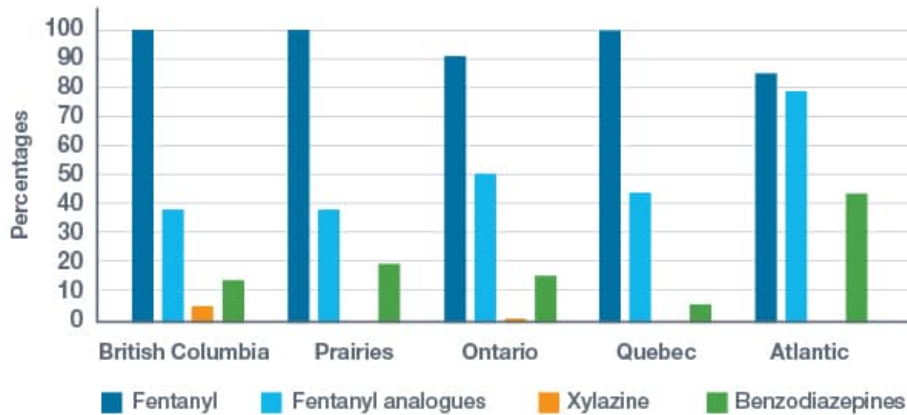
Proportion of medetomidine samples detected by region, January 2023 to July 2024



Of the samples containing medetomidine, many also contained other substances, including fentanyl, fentanyl analogues, xylazine, nitazenes and benzodiazepines. In British Columbia, the Prairies and Quebec, all samples containing medetomidine also contained fentanyl. Medetomidine was most often alongside fentanyl analogues in the Atlantic region, followed by Ontario, Quebec and British Columbia. Benzodiazepines were co-detected with medetomidine primarily in the Atlantic region and to varying degrees across the country. Xylazine was co-detected with medetomidine in only British Columbia. Only one sample containing medetomidine also contained a nitazene and was detected in Ontario (data not shown in next figure).



Proportion of samples containing medetomidine that also contained other substances, by region



Note: The categories are not mutually exclusive, meaning that a given sample containing medetomidine may have contained more than one of the substances reported above. As a result, adding the bars for each region will add to more than 100%.

Top Three Substances Co-detected with Medetomidine by Region

Fentanyl and caffeine were among the top three substances detected alongside medetomidine across all regions. The top three also included dimethyl sulfone* in British Columbia, Manitoba, Ontario, Quebec and Prince Edward Island; bromazolam* in New Brunswick, methamphetamine in Nova Scotia and primidone* in Saskatchewan.

Notes: DAS results featured in this newsletter may differ from other data presented by DAS due to differences in how the data were analyzed and displayed.

*Dimethyl sulfone is an anti-inflammatory medication. Bromazolam is a benzodiazepine not approved for medical use. Primidone is used to treat and control seizures (anticonvulsant).

Source: Health Canada. (2023). Drug Analysis Service.

Reports from Drug Checking Services

The [Canadian National Drug Checking Working Group \(NDCWG\)](#), co-ordinated by CCSA, is a pan-Canadian community of practice of drug checking service providers and their local, provincial, territorial and federal partners. The NDCWG has representatives from Yukon, British Columbia, Alberta, Saskatchewan, Manitoba, Ontario, Quebec, New Brunswick and Prince Edward Island.



A failure to detect medetomidine does not necessarily mean it was not present in the unregulated drug supply. The drug checking technology used by a service may not be sensitive enough to detect trace amounts. This was the case in several samples described below.

01 — British Columbia

Substance Drug Checking (Vancouver Island)

Medetomidine was first detected in a sample submitted by a service user in July 2024, with six samples detected since then. The median concentration was equivalent to 0.7 mg per 100 mg of sample.

British Columbia Centre on Substance Use

British Columbia Centre on Substance Use's Drug Checking Program partners with and reports data from community-based drug checking sites across British Columbia. In addition to testing samples submitted by service users, these sites submit some samples for confirmatory testing to DAS and to Substance Drug Checking's paper-spray mass spectrometer (PS-MS). The Drug Checking Program reports on confirmatory testing of samples expected to be opioids from these sites.

Medetomidine was first detected in a sample sent to DAS in June 2023. Since then, DAS and PS-MS have detected medetomidine in samples from every health region except Northern Health, which submits relatively few samples for confirmatory testing overall.

DAS has identified medetomidine in 28 samples, mostly from the Fraser Health region (19 samples). More than half of these samples have been detected since June 2024. All



samples containing medetomidine also contained fentanyl, its analogues or both. Seventeen samples also contained primidone, all but one of which came from the Fraser Health region. Eight samples also contained benzodiazepines, and eight also contained xylazine.

PS-MS has detected medetomidine in 30 samples, primarily from Fraser Health (17 samples) and Vancouver Coastal Health (10 samples), with two samples from Interior Health and one from Island Health.

02 — Ontario

Toronto's Drug Checking Service

Medetomidine was first detected by Toronto's Drug Checking Service in December 2023. By July 31, 2024, it had been detected in 209 samples expected to be an opioid (i.e., fentanyl, heroin or carfentanil). Medetomidine has been found in combination with multiple high-potency opioids (69%), benzodiazepine-related drugs (58%) and xylazine (12%). The proportion of expected fentanyl samples containing medetomidine increased from 4% in December 2023 to a peak of 27% in May 2024 and was 16% in July 2024. Of the samples that contained medetomidine, 21% were reported as being associated with a drug poisoning. No service user reported expecting medetomidine.

03 — Quebec

Direction de santé publique de la Capitale-Nationale and SABSA

Medetomidine was detected in two samples in February 2024, both of which were from the same batch of coloured (i.e., orange, green, pink) pebbles or crystals sold as "synthetic heroin" or "dog food." Drug checking technology only identified caffeine and fentanyl in the samples, but confirmatory analysis by DAS revealed that the samples contained medetomidine, para-fluorofentanyl, caffeine, MDP2P and MAMDPA. One of the samples also contained fentanyl hydrochloride. Neither sample contained heroin. Service users have reported prolonged periods of sedation but no wounds nor injuries.

Note: 3,4-methylenedioxyphenyl-2-propanone (MDP2 or PMK) is a chemical compound used as a precursor in the synthesis of the methylenedioxyphenethylamine class of compounds (e.g., MDMA [ecstasy]). 6-Methyl 3-oxo-2-[3,4-methylenedioxyphenyl] butanoate [MAMDPA] is a chemical compound used to produce 3,4-Methylenedioxyphenylpropanone (PMK), a precursor used in the synthesis of MDMA.

Additional Reports from Drug Checking Services

Blood Ties Four Directions Centre (Yukon), Winnipeg Regional Health Authority and Street Connections, and Spectre de Rue (Montreal) drug checking services reported that they have not yet detected medetomidine at their sites. Sandy Hill Community Health Centre (Ottawa) reported that they are not equipped with the technology to detect medetomidine at this time.

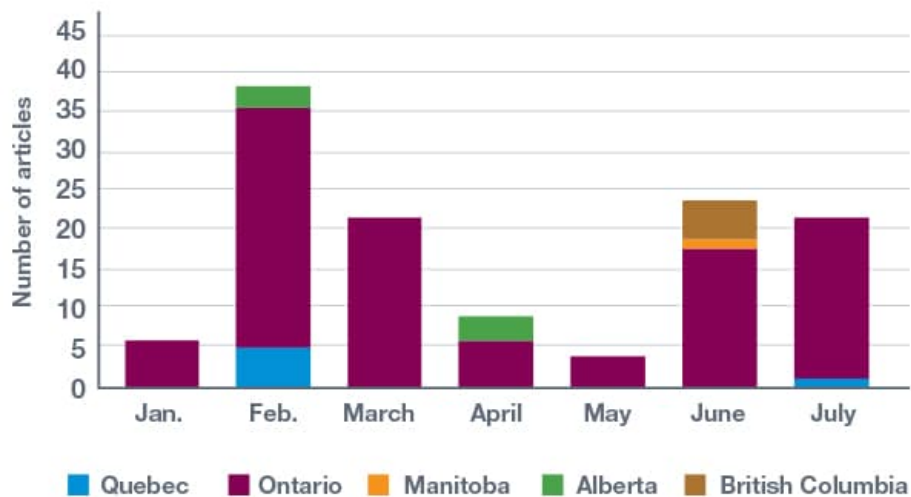


Mentions in the Media

Media mentions are collated by CCSA via manual online searches for news releases and stories and by CCSA's [social reporting platform](#), which uses artificial intelligence to identify relevant posts on substances or drug trends on X.

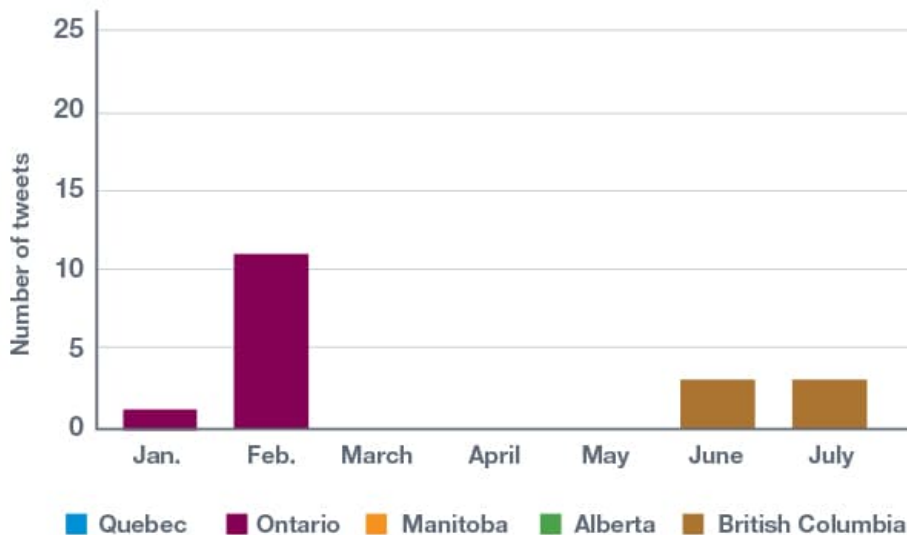
A search from January 2023 to July 2024 captured 144 media mentions (18 tweets and 126 articles, including 25 syndicated articles by at least one other news outlet) on medetomidine or dexmedetomidine from across the country, all of which were published in 2024. The first reports arose in Ontario in January 2024, and in Alberta and Quebec in February 2024. Medetomidine has continued to be reported in Ontario since, with a few reports in other provinces (i.e., Alberta, Manitoba and Quebec). Reports of medetomidine were first mentioned in British Columbia in June 2024.

Number of media mentions of medetomidine by region, January to July 2024





Number of tweets that mentioned medetomidine by region, January to July 2024



Last search date for social media was July 26, 2024, and for media scan was July 29, 2024
A table containing the links to all media mentions is available on our [website](#)

What Does it Mean?

Harm reduction workers and first responders

- Prolonged sedation and the possible delayed onset require a safe space for ongoing monitoring of physical health and safety as well as protection of personal belongings.
- Drug checking services, carrying and administering naloxone, and calling 911 when any drug-related poisoning reactions are observed are critical.
- Treatment with oxygen, respiratory management or both is a key intervention as part of the comprehensive toxic drug poisoning response.
- Although medetomidine is not an opioid, naloxone can reverse the effects of opioids that are likely also present.

People who use drugs

- Do not use drugs alone.
- Start low and go slow.
- If you are aware that medetomidine is in your drug supply, let someone know as you may become sedated for an extended period.



Clinicians

- Become familiar with medetomidine, its mechanism of action and discuss the effects of its use and potential withdrawal with patients, when appropriate.
- Continue to encourage the use of naloxone in the case of any suspected toxic drug poisoning. Inform patients that, although medetomidine is not an opioid, naloxone can reverse the effects of opioids that are likely also present in the unregulated drugs they may consume.

Policy makers

- The introduction of new substances such as medetomidine to the unregulated drug supply is constant, rapid and unpredictable. Medetomidine is the latest of these substances to draw attention, but it is one of many and may be replaced by new ones over time.
- A comprehensive response to the presence of medetomidine in the drug supply includes addressing the unpredictability and toxicity of the supply more broadly.

Note: We thank the Ottawa Public Health Harm Reduction Services team and all other contributors for their valuable input to this section of the newsletter.

Resources

For more information on this topic, see these resources developed by our partners:

- [Medetomidine: “New” veterinary tranquilizer circulating in Toronto’s unregulated fentanyl supply](#)
- [CCENDU Bulletin: Update on Xylazine in Canada and the United States](#)
- [Protonitazepyne and Medetomidine? More Unfamiliar Drugs in Our Supply](#)
- [L’héroïne est toujours remplacée en partie ou en totalité! \(French only\)](#)
- [Medetomidine and Dexmedetomidine](#)

We thank all our partners for their contributions to this newsletter. Your contributions allow us to share valuable insights with subscribers across the country.

Prepared by the CCSA in partnership with the Canadian Community Epidemiology Network on Drug Use (CCENDU)

The Canadian Community Epidemiology Network on Drug Use (CCENDU) is a nation-wide network of community level partners who share information about local trends and emerging issues in substance use and exchange knowledge and tools to support more effective data collection.

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