Canadian Centre on Substance Use and Addiction

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Community Urinalysis and Self-Report Project: Cross-Canada Trends in Benzodiazepine Use from 2021–2023

Key Findings

- Benzodiazepine detection ranged from 19.7 per cent to 61.7 per cent of participants. Unexpected benzodiazepine use was common, from 40 per cent in Edmonton and Nova Scotia to 74.2 per cent in Ottawa. While alarming, these findings are likely conservative due to limitations in the detection of non-medical benzodiazepines.
- In British Columbia, Edmonton, Regina, Ottawa and Peel, between 65 per cent and 93.1 per cent of participants' urine containing benzodiazepines also contained fentanyl. In these regions, 66.7 per cent to 88.9 per cent of participants who reported the use of benzodiazepines also reported the use of fentanyl in the past three days.
- Specific risks posed by the co-occurrence of non-medical benzodiazepines and fentanyl in the drug supply must be mitigated.

Acknowledgements

We sincerely thank the organizations and individuals involved in collecting, interpreting and sharing the data that informed this work. We extend our deepest appreciation to the harm reduction organizations and participants who devoted their time and efforts to this project amid the devastating drug poisoning crisis.

Background and Methods

The Community Urinalysis and Self-Report Project (CUSP) is a low-barrier sentinel surveillance system developed to better understand use of drugs from the toxic, unregulated supply. This knowledge informs local and cross-Canada initiatives to reduce harms to people who use these drugs. CUSP is implemented through a standardized project toolkit across Canada, including at provincial levels in British Columbia and Quebec, as well as locally by partner sites. The Canadian Centre on Substance Use and Addiction (CCSA) co-ordinates the project.

Between January 2021 and April 2023, 2,634 participants were recruited from partner sites that are harm reduction service organizations located in seven regions across Canada. Expected drug use (self-report survey on past three-day use) was compared with actual drug exposure (urine sample analyzed with urine toxicology). More details on the methods are available in *Community Urinalysis and Self-Report Project: Methods Report for 2021–2023 Data* (CCSA, 2024a).

This report focuses on trends in the use of benzodiazepines and is one in a series of three that summarizes the substance specific findings. Other reports focus on opioids (CCSA, 2024d), stimulants (CCSA, 2024c) and more general findings and implications outlined in the overall trends report (CCSA, 2024b). These reports are intended for people involved in harm reduction research, surveillance, service delivery and policy making.

Findings

Reported Use and Detection of Benzodiazepines

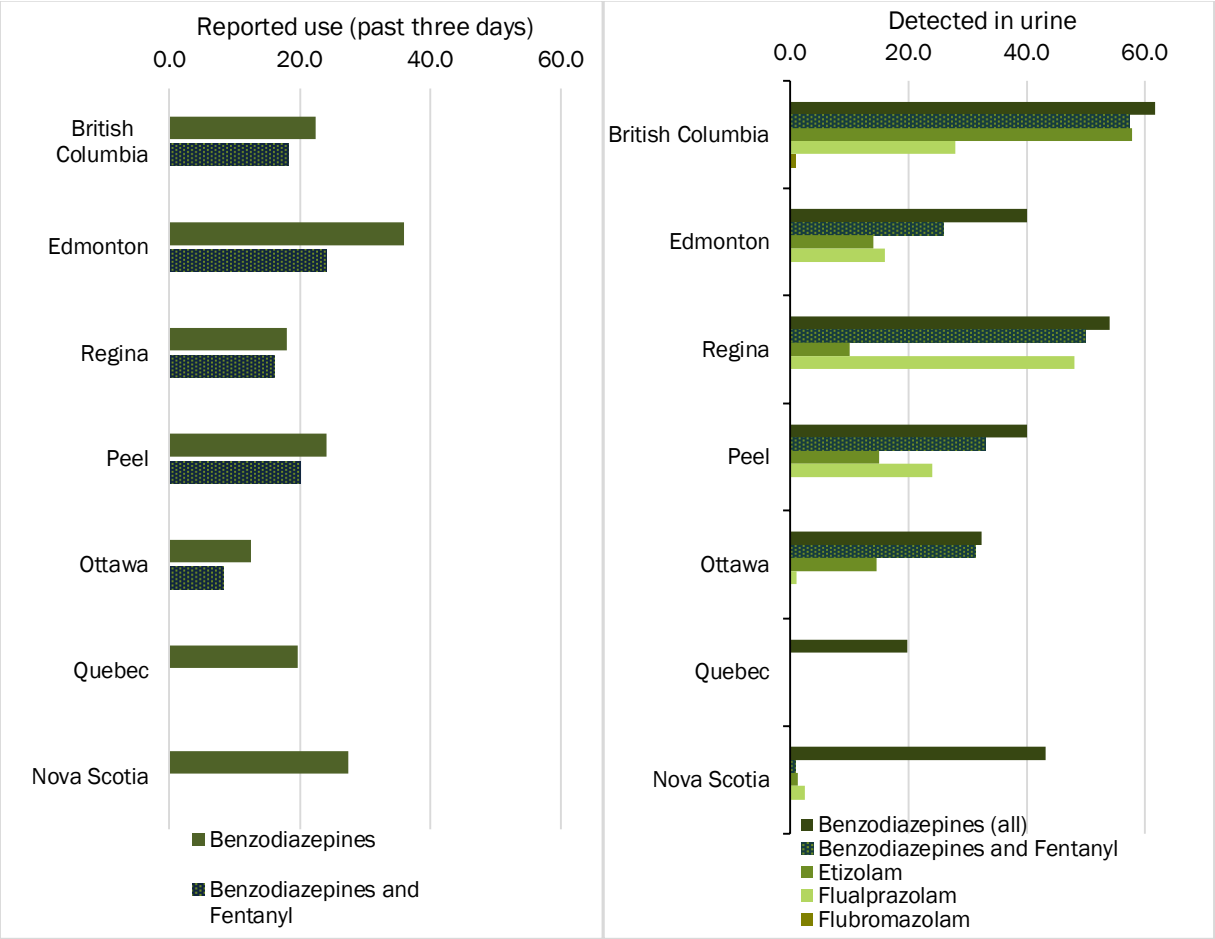
Reported use of benzodiazepines ranged from 12.5 per cent to 36 per cent of participants, while detection of benzodiazepines ranged from 19.7 per cent to 61.7 per cent of participants (refer to Figure 1).

There were large regional differences in the detection of non-medical benzodiazepines (NMBs). For instance, flualprazolam was detected more often than etizolam in Peel (24 per cent vs. 15 per cent), while the opposite was true for Ottawa (one per cent vs. 14.6 per cent).

In British Columbia, Edmonton, Regina, Ottawa and Peel, at least two in three participants who reported using benzodiazepines also reported using fentanyl (66.7 per cent to 88.9 per cent) (refer to Figure 1). Similarly, fentanyl was co-detected among 65 per cent to 96.8 per cent of participants in these regions whose urine contained benzodiazepines.

Detection of benzodiazepines was likely underestimated because some non-medical benzodiazepines (NMBs) cannot be detected with the urine toxicology screening used in most regions. Most regions were able to detect only three types of NMBs. This does not include bromazolam, the NMB found most often in drugs seized by police in recent years (Health Canada, 2023). In Quebec, nine other types of NMBs could be detected; however, data on their detection and benzodiazepine-fentanyl co-use were not available.

Figure 1. Percentage of participants who reported the use of benzodiazepine use and co-use of benzodiazepines and fentanyl, by reported used (past three days) and detection in their urine



Note Excluding Quebec, only three types of non-medical benzodiazepines (NMBs) could be detected with the urine toxicology used in this study. Other NMBs cannot be detected, likely resulting in underestimation of total benzodiazepine detection and unexpected use. In Quebec, nine other types of NMBs could be detected; however, data on their detection and benzodiazepine-fentanyl co-use were not available.

For an accessible version of this figure, refer to Appendix Table 1.

Accordance Between Reported and Detected Use

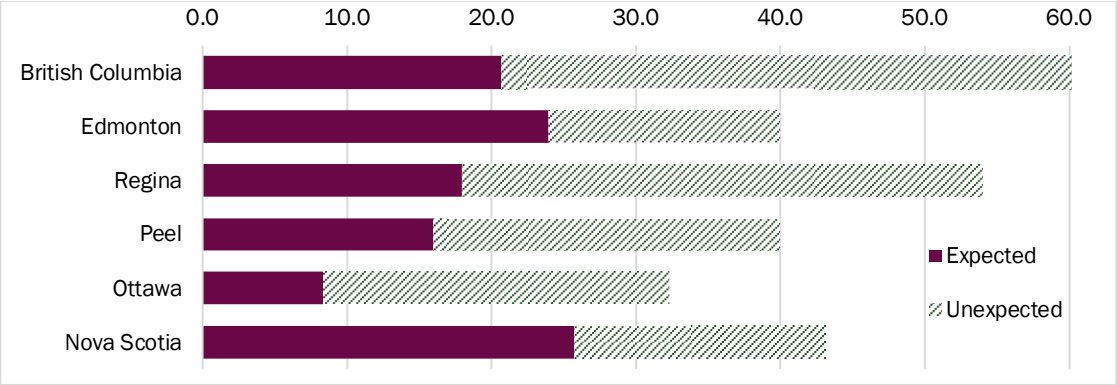
We assessed the accordance between reported and detected substance use for two measures:

- Among those who had the substance detected in their urine, was it expected (i.e., reported) or unexpected (i.e., not reported)?
- Among those who reported using the substance, was it detected in their urine (i.e., correctly identified or a “bunk” substance)?

Unexpected benzodiazepine use occurred among 40 per cent (Edmonton and Nova Scotia) to 74.2 per cent (Ottawa) of participants who had benzodiazepines detected in their urine (refer to Figure 2).

Among those with unexpected benzodiazepine use, we assessed other substances that they reported used in the past three days. In British Columbia, Edmonton, Regina, Ottawa and Peel, between 37.5 per cent and 80.2 per cent of these participants reported fentanyl use (data not shown).

Figure 2. Percentage of participants who had benzodiazepines detected in urine, by expectation

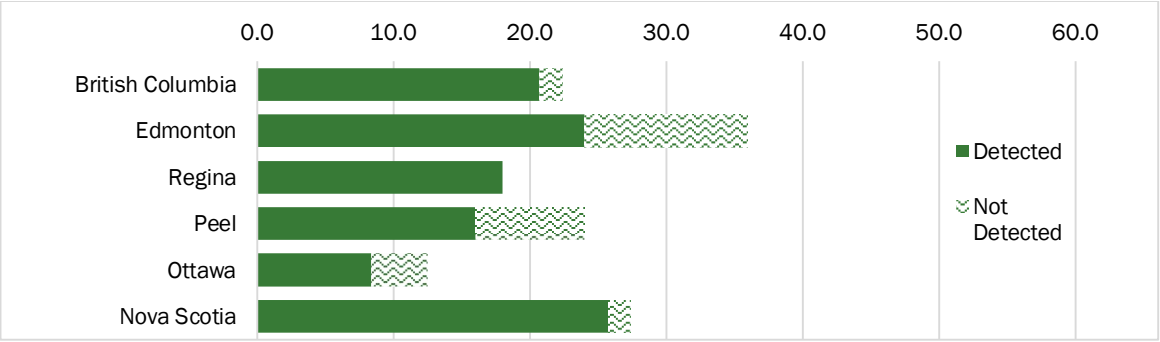


Note. Expectation was determined based on the reported use matching what was detected. Unexpected was a mismatch. Unexpected use of methamphetamine/amphetamine may be overestimated due to the use of certain synthetic stimulants. Data from Quebec were unavailable. Excluding Quebec, only three types of non-medical benzodiazepines (NMBs) could be detected with the urine toxicology used in this study. Other NMBs cannot be detected, likely resulting in underestimation of total benzodiazepine detection and unexpected use. In Quebec, nine other types of NMBs could be detected; however, data on their detection were not available.

For an accessible version of this figure, refer to Appendix Table 2.

We assessed whether the substances participants reported using in the past three days were also detected in their urine. This measure of concordance for benzodiazepine use varied among the regions assessed (refer to Figure 3).

Figure 3. Percentage of participants who reported the use of benzodiazepines (past three days), by detection of the substance in their urine



Note. Excluding Quebec, only three types of non-medical benzodiazepines (NMBs) could be detected with the urine toxicology used in this study. Other NMBs cannot be detected, likely resulting in underestimation of total benzodiazepine detection and unexpected use. In Quebec, nine other types of NMBs could be detected; however, data on their detection were not available.

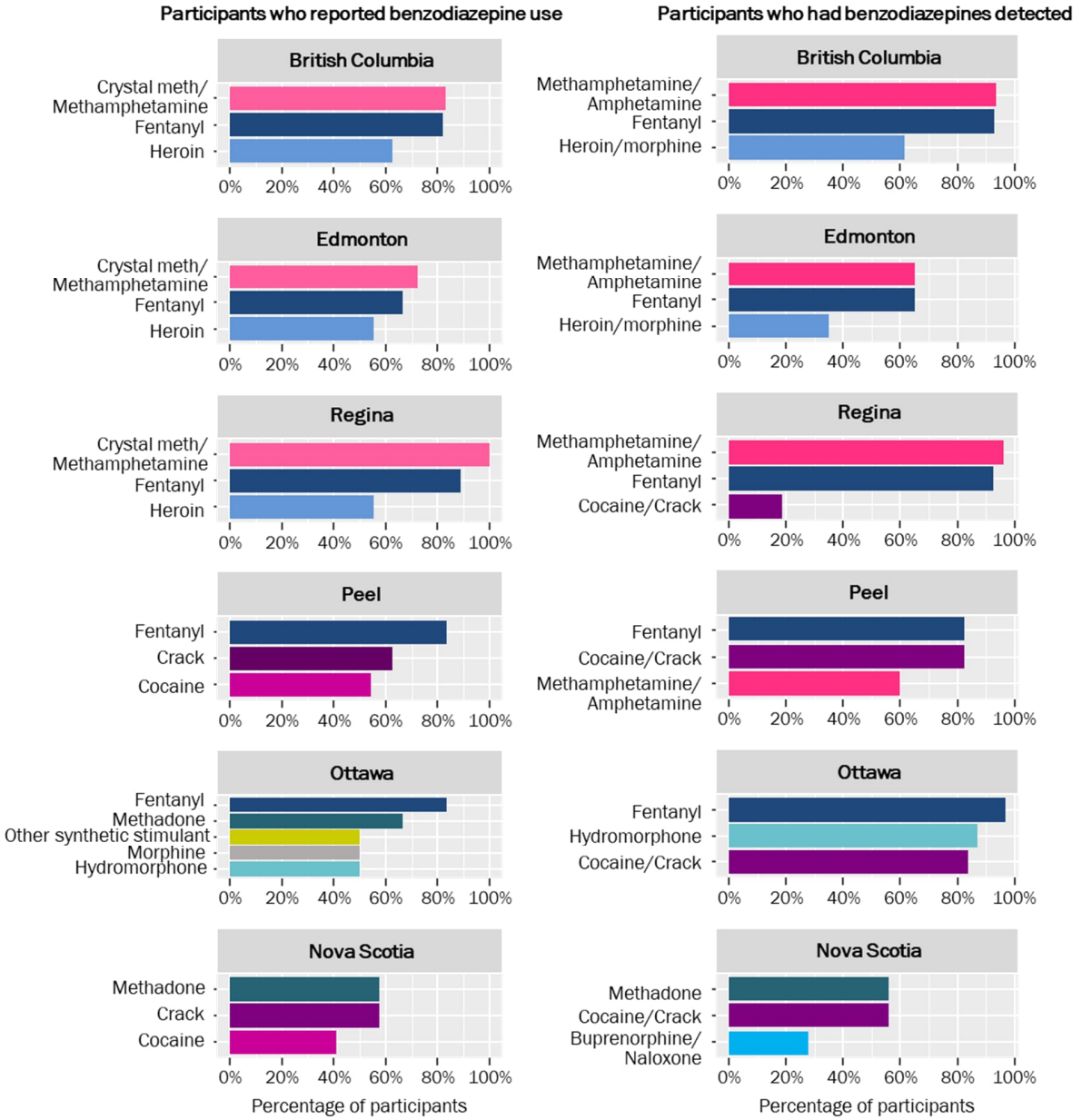
For an accessible version of this figure, refer to Appendix Table 3.

Polysubstance Use

For this study, polysubstance use refers to two substances that were both reported as being used in the past three days or detected in the urine samples. This likely includes different types of polysubstance use, including simultaneous (i.e., present in the same substance consumed at one time), sequential (i.e., used one after the other in the same episode), and co-use over the three-day period.

As stated in association with Figure 1, fentanyl and benzodiazepines were frequently co-used among participants in British Columbia, Edmonton, Regina, Ottawa and Peel. Additionally, co-use of benzodiazepines with other types of opioids — like methadone, heroin and hydromorphone — was common. In British Columbia, Edmonton and Regina, crystal meth/methamphetamine (methamphetamine/amphetamine) was the substance used most often among those with reported use or detection of benzodiazepines (refer to Figure 4). (Methamphetamine use may lead to the presence of both methamphetamine and amphetamine in urine.)

Figure 4. Among participants who reported the use of benzodiazepines (past three days) or had benzodiazepines detected in their urine, percentage with co-use with other substances (top three most common co-use combinations including ties for third)



Note. Methamphetamine use may lead to the presence of both methamphetamine and amphetamine in urine. Detection of cocaine and crack are combined because they are not distinguishable by urine toxicology. Hydromorphone detection may result from codeine, morphine or hydromorphone use. Data were unavailable for Quebec.

For an accessible version of this figure, refer to Appendix Table 4.

Summary

This report presents the key trends in the use of benzodiazepines among participants recruited from harm reduction organizations in seven regions between 2021 to 2023. In most regions, high rates of unexpected benzodiazepine were observed. This was despite a likely underestimation of the presence of NMBs, due to limitations in urine toxicology.

Co-use of benzodiazepines with fentanyl was also high among harm reduction clients across the regions. These trends are consistent with other data on the drug supply (Canadian Community Epidemiology Network on Drug Use [CCENDU], 2021; Health Canada, 2023) and poisoning-related harms (British Columbia Coroners Service, 2023; Gomes et al., 2023). In addition to the risks posed by the toxic drug supply more broadly, these findings suggest that people who use drugs are at risk of multiple potential harms specific to benzodiazepines.

Recent evidence also suggests that people using both benzodiazepines and fentanyl may also be simultaneously exposed to xylazine, potentially putting them at even greater risk of poisoning (CATIE, 2024).

For implications and recommendations associated with these findings, please refer to the overall findings report for CUSP results from 2021 to 2023 (CCSA, 2024b).

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Appendix

Table 1. Percentage of participants who reported use of substance (past three days) or had substance detected in their urine, top three

Substance	B.C. Reported	B.C. Detected	Edmonton Reported	Edmonton Detected	Regina Reported	Regina Detected	Peel Reported	Peel Detected	Ottawa Reported	Ottawa Detected	Quebec Reported	Quebec Detected	N.S. Reported	N.S. Detected
Benzodiazepines (any type)	22.4	61.7	36.0	40.0	18.0	54.0	24.0	40.0	12.5	32.3	19.6	19.7	27.4	43.2
Etizolam	—	57.9	—	14.0	—	10.0	—	15.0	—	14.6	—	n/a	—	1.2
Flualprazolam	—	27.9	—	16.0	—	48.0	0.0	24.0	—	1.0	—	n/a	—	2.5
Flubromazolam	—	0.7	—	0.0	—	0.0	—	0.0	—	0.0	—	n/a	—	0.0
Benzodiazepines and fentanyl	18.3	57.4	24.0	26.0	16.0	50.0	20.0	33.0	8.3	31.3	n/a	n/a	0.0	0.8

Note. n/a = not available; — not included in the survey or cannot be distinguished by urine toxicology.

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Table 2. Percentage of participants who had benzodiazepines detected in urine, by expectation

Substance	B.C. Expected	B.C. Unexpected	Edmonton Expected	Edmonton Unexpected	Regina Expected	Regina Unexpected	Peel Expected	Peel Unexpected	Ottawa Expected	Ottawa Unexpected	N.S. Expected	N.S. Unexpected
Benzodiazepines	33.6	66.4	60.0	40.0	33.3	66.7	40.0	60.0	25.8	74.2	59.6	40.4

Note. Expectation was determined based on the reported use matching what was detected. Unexpected was a mismatch. Unexpected use of methamphetamine/amphetamine may be overestimated due to the use of certain synthetic stimulants. Data from Quebec were unavailable. Data were unavailable for Quebec.

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Table 3. Percentage of participants who reported use of benzodiazepines (past three days), by detection of substance¶

Substance	B.C. Detected	B. C. Not Detected	Edmonton Detected	Edmonton Not Detected	Regina Detected	Regina Not Detected	Peel Detected	Peel Not Detected	Ottawa Detected	Ottawa Not Detected	N.S. Detected	N.S. Not Detected
Benzodiazepines	92.6	7.4	66.7	33.3	100.0	0.0	66.7	33.3	66.7	33.3	93.9	6.1

Note. Data were unavailable for Quebec.

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Table 4. Among participants who reported use of benzodiazepines (past three days) or had benzodiazepines detected in urine, percentage with co-use of other substances (top three most common co-use combinations)

Table 4a. Stimulants

Substance	B.C. Reported	B.C. Detected	Edmonton Reported	Edmonton Detected	Regina Reported	Regina Detected	Peel Reported	Peel Detected	Ottawa Reported	Ottawa Detected	N.S. Reported	N.S. Detected
Cocaine/crack†	—	55.2	—	10.0	—	18.5*	—	82.5*	—	83.9*	—	55.8*
Cocaine	23.4	—	38.9	—	33.3	—	54.2*	—	33.3	—	40.9*	—
Crack	29.8	—	38.9	—	44.4	—	62.5*	—	41.7	—	57.6*	—
Crystal meth/ methamphetamine (methamphetamine/ amphetamine)‡	83.0*	93.4*	72.2*	65.0*	100.0*	96.3*	50.0	60.0*	41.7	64.5	7.6	10.6
MDMA (ecstasy)	12.8	0.8	16.7	0.0	0.0	0.0	8.3	2.5	0.0	3.2	3.0	1.0
Other synthetic stimulants	17.0	14.3	33.3	0.0	0.0	3.7	16.7	0.0	50.0*	51.6	31.8	19.2

Table 4b. Opioids

Substance	B.C. Reported	B.C. Detected	Edmonton Reported	Edmonton Detected	Regina Reported	Regina Detected	Peel Reported	Peel Detected	Ottawa Reported	Ottawa Detected	N.S. Reported	N.S. Detected
Buprenorphine/ naloxone	9.6	5.4	33.3	10.0	0.0	0.0	20.8	15.0	16.7	12.9	27.3	27.9*
Fentanyl§	81.9*	93.1*	66.7*	65.0*	88.9*	92.6*	83.3	82.5*	83.3*	96.8*	1.5	1.9
Heroin/morphine‖	—	61.4*	—	35.0*	—	11.1	—	37.5	—	71.0	—	14.4
Heroin	62.8*	—	55.6*	—	55.6*	—	25.0	—	33.3	—	0.0	—
Morphine	34.0	—	44.4	—	22.2	—	29.2	—	50.0*	—	16.7	—
Hydromorphone#	50.0	41.3	38.9	15.0	11.1	3.7	8.3	25.0	50.0*	87.1*	27.3	24.0
Methadone	45.7	34.7	27.8	20.0	0.0	7.4	41.7	37.5	66.7*	64.5	57.6*	55.8*
Oxycodone	14.9	0.8	50.0	10.0	0.0	0.0	12.5	0.0	8.3	0.0	4.5	0.0

Notes. n/a = not included in the survey or cannot be distinguished by urine toxicology. Data were unavailable for Quebec.

* The combinations reported used by the highest percentage of participants (top three including ties)

† Detection of cocaine and crack are combined because they are not distinguishable by urine toxicology. Survey responses to “cocaine (powder)” and “crack/freebase” were combined to facilitate comparison.

‡ Methamphetamine use may lead to the presence of both methamphetamine and amphetamine in urine.

§ Detection of fentanyl includes fentanyl analogues (e.g., carfentanil).

‖ Detection of heroin and morphine use were combined because the direct metabolite of heroin (6-monoacetylmorphine) clears rapidly from urine, after which it is difficult to discern heroin from morphine use. Reported use of heroin and morphine were combined to facilitate comparison.# Hydromorphone detection may result from codeine, morphine or hydromorphone use.

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About CCSA

CCSA was created by Parliament to provide national leadership to address substance use in Canada. A trusted counsel, we provide national guidance to decision makers by harnessing the power of research, curating knowledge and bringing together diverse perspectives.

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