

AT-A-GLANCE: NEWLY REPORTED PSYCHOACTIVE SUBSTANCES IN CANADA

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Newly Reported Psychoactive Substances in Canada

2020 - 2021

SUMMARY

- 42 new psychoactive substances were detected in Canada between January 2020 and December 2021.
- In total, there were 11 new Opioids, 9 new Hallucinogen, 5 new Stimulants and 4 new Depressants.
- A majority of detections were reported from samples submitted by the province of Ontario.
- Among new opioids, Nitazenes (Etodesnitazene, Metonitazene and Protonitazene) were most frequently detected.

CONTEXT

Between January 2020 and December 2021, there were 42 new psychoactive substances detected.

AIM

The aim of this report is to describe new psychoactive substances which emerged in Canada since 2020.

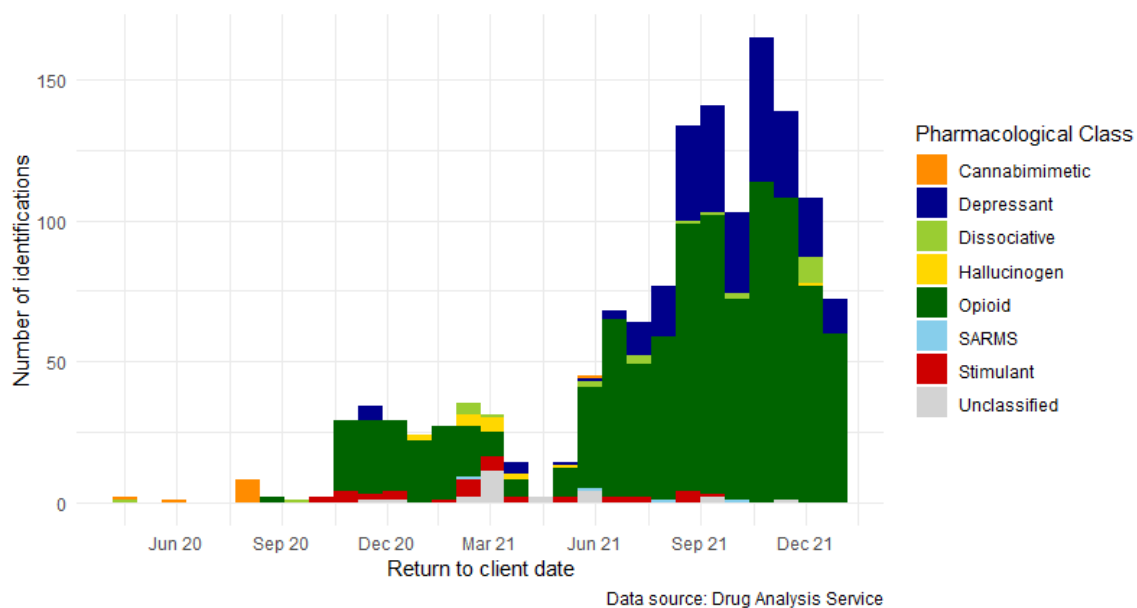


Figure 1. New psychoactive substances identifications per Pharmacological class

DATA LIMITATIONS

This report draws on data made available by the Drug Analysis Service which regularly analyses seized drug exhibits submitted by Canadian Law Enforcement agencies. Some limitations govern the present data. First, law enforcement agencies submit samples for laboratory analysis on a voluntary basis. Therefore, a limited number of samples are analyzed for each substance; low number of samples may not provide an accurate picture of currently circulating substances and analyzed samples may not be representative of seized substances. In addition, analyzed samples may not be representative of substances circulating on the market as a number of factors may influence substances submitted by Canadian Law Enforcement agencies and reporting, such as increased awareness of substances and law enforcement capacities and priorities.

ANALYTICAL METHODS

Identification and confirmation of NPS required various analytical techniques. General analytical methods are described below.

First, when comparing to a verified reference material two tests are required; typically Gas Chromatography Flame Ionization Detection (GC-FID) and a spectroscopic technique such as Gas Chromatography-Mass Spectrometry (GC-MS) or an Infrared spectroscopy (IR) technique such as solid phase IR or GC-IR.

In certain cases, a reference material cannot be verified using Mass Spectrometry (MS) or Infrared Spectroscopy due to lack of published literature and Nuclear Magnetic Resonance Spectroscopy (NMR) is employed to verify the standard so the MS and IR spectra can be used for comparison purposes.

In rare cases where a reference standard is not available, literature reference can be used to identify a compound where appropriate. If literature reference cannot be found, a complete structure elucidation of the compound is made using various ¹H and ¹³C techniques 1-dimensional and 2-dimensional experiments, coupled with accurate mass MS spectra and derived chemical formula.

CLASSIFICATION

- Since 2020, there were 11 new Opioids, 9 new Hallucinogen, 5 new Stimulants and 4 new Depressants.

Table 1. Number of new reports by Class (N = 42)

<i>Pharmacological Class</i> Chemical Class	N (% total)
<i>Cannabimimetic</i>	2
Cannabinoid & Mimetics Class	2 (4.8%)
<i>Depressant</i>	4
Benzodiazepine (BZD) Class	3 (7.1%)
Quinazolinone (Quaalude) Class	1 (2.4%)
<i>Dissociative</i>	3
Ketamine Class	3 (7.1%)
<i>Hallucinogen</i>	9
Arylcyclohexylamine (PCP) Class	2 (4.8%)
Lysergic Acid (LSD) Class	1 (2.4%)
Phenethylamines (Main) Class	1 (2.4%)
Tryptamine Class	5 (11.9%)
<i>Opioid</i>	11
Fentanyl (Sub) Class	4 (9.5%)
Opioid Class (Non-Fentanyl, Non-Opiates)	7 (16.7%)
<i>SARMS</i>	1
Selective Androgen (Or Estrogen) Receptor Modulator (SARM/SERM) Class	1 (2.4%)
<i>Stimulant</i>	5
Amphetamine / Methamphetamine (Sub) Class	2 (4.8%)
Cathinone (Sub) Class	3 (7.1%)
<i>Other substances</i>	7
Phenethylamines (Main) Class	1 (2.4%)
Precursor / Key Intermediate / Reagent	2 (4.8%)
Other (Drug) Prescription, OTC, Or Illicit	4 (9.5%)

GEOGRAPHICAL LOCATIONS

- A majority of NPS identifications were detected in Ontario.

Table 2. Number of identifications per Province or Territory (N = 1093)

Province	N (% total)
Alberta	184 (13.4%)
British Columbia	153 (11.2%)
Manitoba	3 (0.2%)
New Brunswick	20 (1.5%)
Nova Scotia	6 (0.4%)
Ontario	805 (58.7%)
Quebec	189 (13.8%)
Saskatchewan	11 (0.8%)

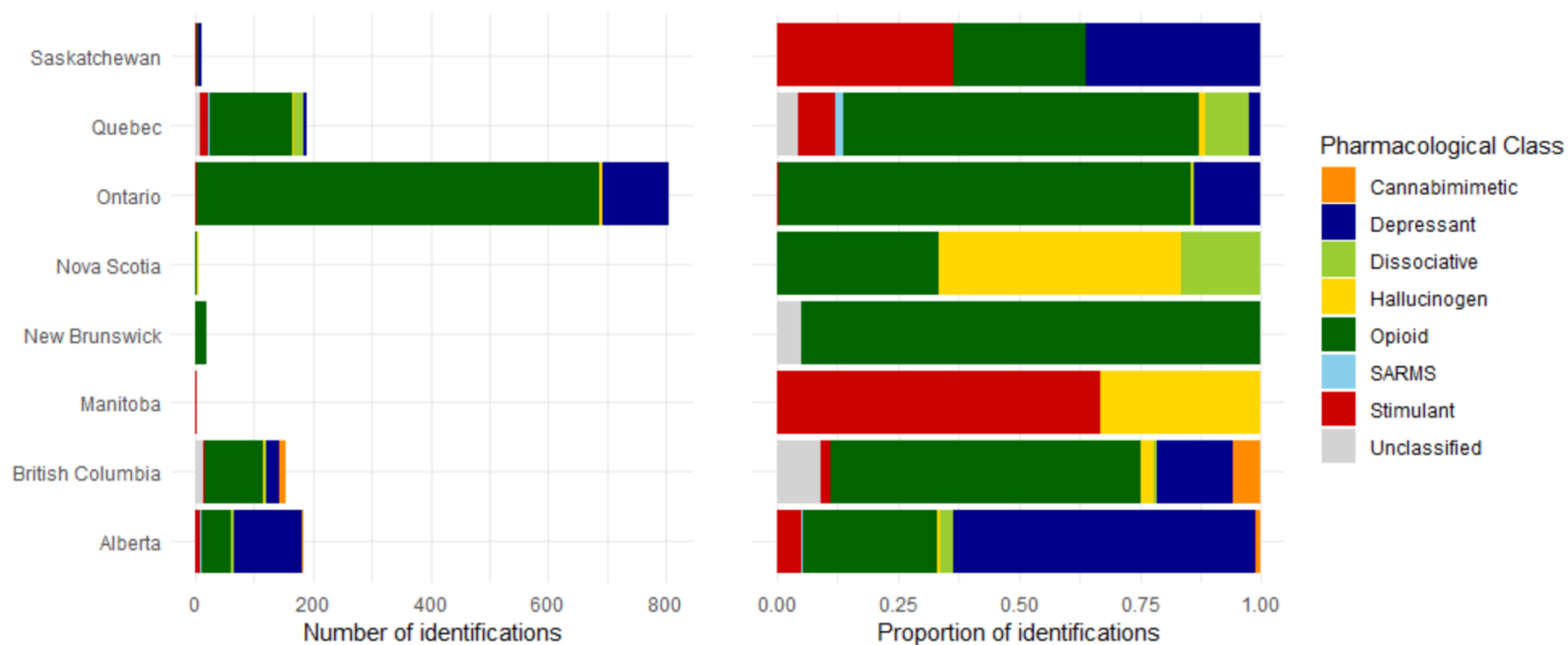


Figure 2. Number and proportion of NPS identifications per Pharmacological class, per Province

Table 3. First detection of new psychoactive substances

Drug name	Date Received	City	Province	Description
Cannabimimetic				
<i>Cannabinoid & Mimetics Class</i>				
4-cyano CUMYL-BUTINACA	February 27, 2020	Richmond	British Columbia	Powder
ACHMINACA	March 4, 2020	Lloydminster	Alberta	Powder
Depressant				
<i>Benzodiazepine (BZD) Class</i>				
Bromazolam	January 21, 2021	Calgary	Alberta	Powder Tablets Residue Rock-like solid
Chlorodiazepam	April 29, 2021	Westmount	Quebec	Tablets
Norfludiazepam	March 10, 2021	Brantford	Ontario	Powder
<i>Quinazolinone (Quaalude) Class</i>				
SL-164	September 2, 2020	Vancouver	British Columbia	Powder Resinous substance
Dissociative				
<i>Ketamine Class</i>				
Deoxymethoxetamine	November 24, 2020	Banff	Alberta	Powder
Deschloro-N-ethyl-ketamine	November 24, 2020	Banff	Alberta	Powder
Methoxisopropamine	November 24, 2020	Banff	Alberta	Powder

Hallucinogen

Arylcyclohexylamine (PCP) Class

3-hydroxy PCE	September 11, 2020	Darmouth	Nova Scotia	Powder
Fluoro phencyclidine	October 27, 2020	Mission	British Columbia	Crystalline substance

Lysergic Acid (LSD) Class

1-cyclopropionyl LSD	February 11, 2021	Gatineau	Quebec	Blotter paper
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Phenethylamines (Main) Class

Methallylescaline	December 23, 2020	Napanee	Ontario	Powder
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Tryptamine Class

4-Acetoxy MALT	September 10, 2020	Ottawa	Ontario	Powder
4-acetoxy MET	November 23, 2020	Nanaimo	British Columbia	Powder
4-acetoxy-N-methyl-N-Isopropyltryptamine	November 9, 2020	New Westminster	British Columbia	Powder
5-methoxy-N-methyl-N-allyltryptamine	November 9, 2020	New Westminster	British Columbia	Resinous substance
Ethylpropyltryptamine	September 10, 2020	Ottawa	Ontario	Residue

Opioid

Fentanyl (Sub) Class

Bromofentanyl	August 12, 2021	Burnaby	British Columbia	Powder
Chlorofentanyl	April 23, 2020	Vernon	British Columbia	Powder Residue
Hexanoyl fentanyl	May 28, 2020	Cambridge	Ontario	Powder
para-Fluorofentanyl	April 9, 2021	Akwesasne	Ontario	Powder Residue Rock-like solid

Opioid Class (Non-Fentanyl, Non-Opiates)

5-Aminoisotonitazene	July 29, 2021	Toronto	Ontario	Syringe
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Etodesnitazene	June 26, 2020	Granby	Quebec	Powder Residue Material Syringe
Flunitazene	December 9, 2020	Hamilton	Ontario	Powder Residue
Metonitazene	August 21, 2020	Hamilton	Ontario	Powder Residue Rock-like solid
N-Pyrrolidino Etonitazene (Etonitazepyne)	May 7, 2021	Napanee	Ontario	Powder Residue Tablets
Protonitazene	December 30, 2020	Quebec	Quebec	Tablets Powder Residue
W-19	April 26, 2021	Victoria	British Columbia	Powder

SARMS

Selective Androgen (Or Estrogen) Receptor Modulator (SARM/SERM) Class

RAD140	October 19, 2020	Lethbridge	Alberta	Tablets Liquid
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Stimulant

Amphetamine / Methamphetamine (Sub) Class

N,N-dimethyl-3,4-dimethoxyamphetamine	November 27, 2019	Sylvan Lake	Alberta	Tablets
N-pyrrolidino-3,4-dimethoxyamphetamine	November 27, 2019	Sylvan Lake	Alberta	Tablets

Cathinone (Sub) Class

4'-fluoro-3'-methyl-alpha-pyrrolidinopentiophenone	September 23, 2020	Aurora	Alberta	Tablets Powder Rock-like solid
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alpha-Pyrrolidino-2-phenylacetophenone	December 17, 2020	Longueuil	Quebec	Powder
alpha-Pyrrolidinocyclohexanophenone	March 25, 2021	Laval	Quebec	Crystalline substance

Other substances

Phenethylamines (Main) Class

4-Fluorophenibut	June 22, 2021	Saint-Clet	Quebec	Powder
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Precursor / Key Intermediate / Reagent

Methyl 2-phenylacetoacetate	September 2, 2020	Vancouver	British Columbia	Powder
1-Benzyl-4-piperidone	August 14, 2020	Milton	Ontario	Powder

Other (Drug) Prescription, Otc, Or Illicit

1-(1,3-Benzodioxol-5-yl)-2,2-dibromo-1-pentanone	August 24, 2020	Nanaimo	British Columbia	Powder Crystalline substance
Bromantane	September 2, 2020	Jonquière	Quebec	Powder
Octodrine	December 22, 2020	Woodstock	New Brunswick	Powder
Tiletamine	March 4, 2020	Lloydminster	Alberta	Powder Crystalline substance

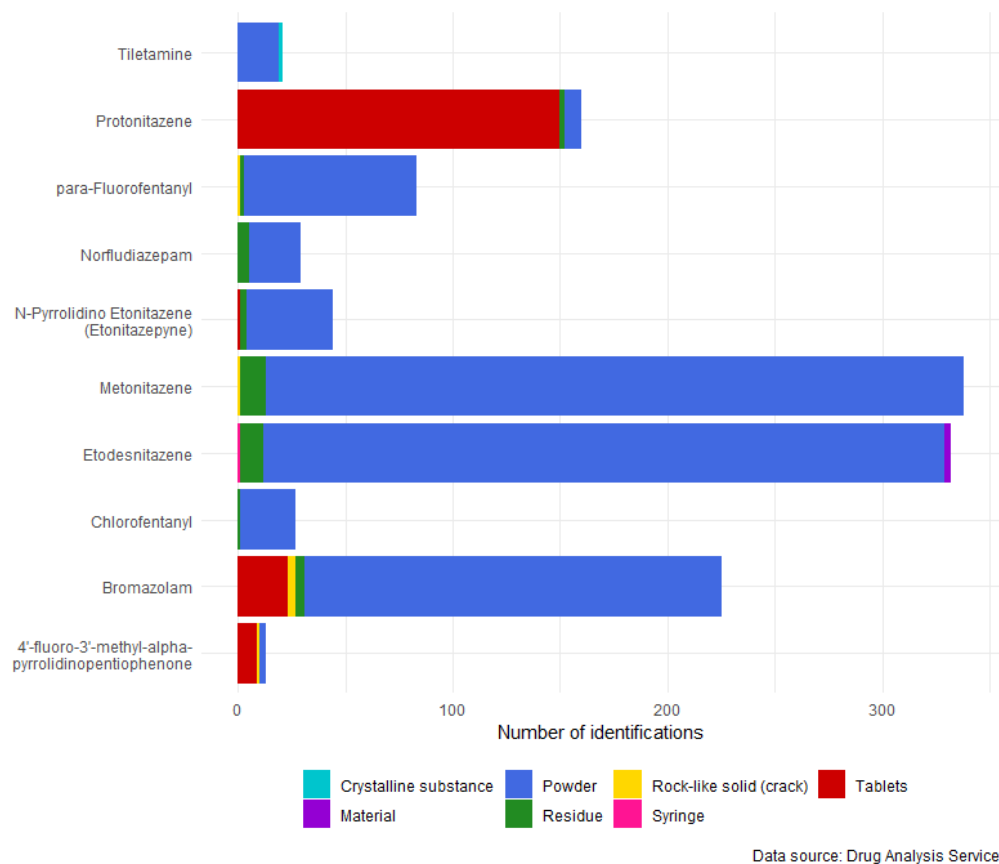


Figure 3. Physical description of substances of interest

FREQUENCY OF DETECTIONS

- Nitazenes (Etodesnitazene, Metonitazene and Protonitazene) were among the most frequently detected new psychoactive substances.
- The benzodiazepine Bromazolam was also among the most frequently detected NPS since it first emerged.

PHYSICAL DESCRIPTION

- Frequently detected emerging psychoactive substances are most often found in powder or tablet form.

Table 4. Number of detections between 2020 - 2021 for most frequently detected substances of interest

Drug name	Detections (n)
Metonitazene	338
Etodesnitazene	332
Bromazolam	225
Protonitazene	160
para-Fluorofentanyl	83
N-Pyrrolidino Etonitazene (Etonitazepyne)	44
Norfludiazepam	29
Chlorofentanyl	27
Tiletamine	21
Methyl 2-phenylacetoacetate	20
N-pyrrolidino-3,4-dimethoxyamphetamine	14
4'-fluoro-3'-methyl-alpha-pyrrolidinopentiophenone	13

CO-DETECTIONS

- Nitazenes Etodesnitazene and Metonitazene were frequently detected with Fentanyl, Dimethylsulphone and other nitazenes.
- Bromazolam was also frequently co-detected with Fentanyl.
- The co-involvement of stimulants, benzodiazepines and alcohol has been identified as one of the key drivers in the worsening of opioid-related deaths in North America¹

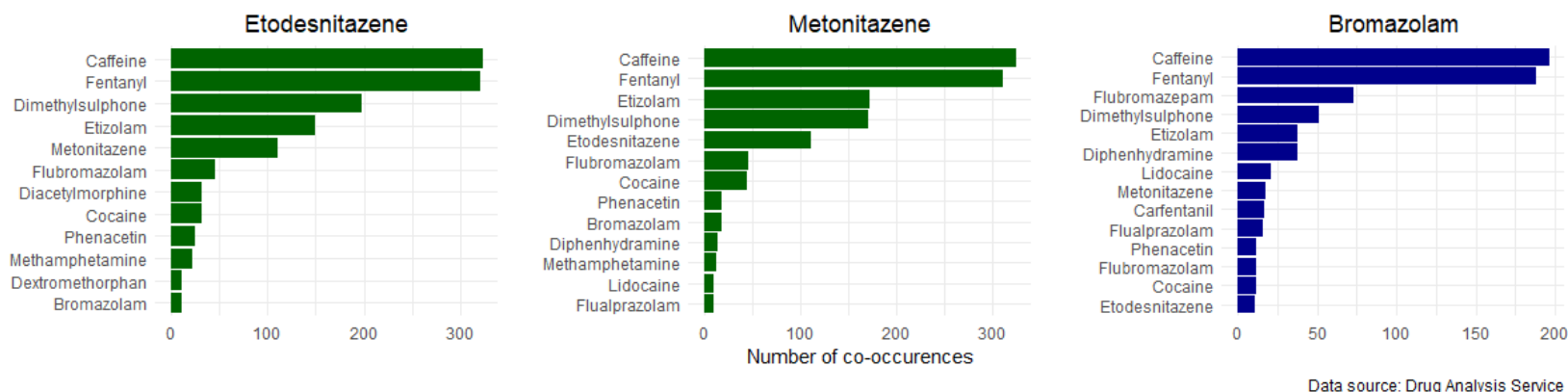


Figure 4. Co-detections for substances of interest

CONCLUSION

This short report describes 42 new psychoactive substances (NPS) first detected in Canada between 2020 and 2021, including emerging Opioids (11), Hallucinogens (9), Stimulants (5) and Depressants (4). Over half (58.7%) of NPS were detected in Ontario. Frequently detected NPS were most often found in powder or tablet form. They include Nitazenes Metonitazene (n=338, opioid class), Etodesnitazene (n=332, opioid class) and Protonitazene (n=160, opioid class) as well as the Benzodiazepine Bromazolam (n=225, depressant class). Finally, frequently co-detected substances with Metonitazene, Etodesnitazene and Bromazolam include Caffeine (cutting agent) and Fentanyl (opioid class). As Nitazenes were the emerging psychoactive substance which were most frequently detected, a more in-depth examination of their emergence would be of interest.

¹ Compton, W. M., R. J. Valentino and R. L. DuPont (2021). "Polysubstance use in the U.S. opioid crisis." Mol Psychiatry 26(1): 41-50.

SUGGESTED CITATION

Government of Canada. (2022). Health Canada Drug Analysis Service. At-A-Glance: Newly Reported Psychoactive Substances in Canada. Longueuil (QC), 2022. Retrieved from <https://www.canada.ca/en/health-canada/services/publications/healthy-living/psychoactive-substances-canada-2020-2021.html>.

For more information, please contact Health Canada's Drug Analysis Service:

<https://www.canada.ca/en/health-canada/services/health-concerns/controlled-substances-precursor-chemicals/drug-analysis-service.html#a3>

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