What's in Toronto's Drug Supply?

Results from Samples Checked by Toronto's Drug Checking Service
October 10, 2019 – March 31, 2020

CENTRE ON
DRUG POLICY
EVALUATION

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Contents

Overview of Toronto's Drug Checking Service

People who use drugs in Toronto have long advocated for access to drug checking in an effort to reduce the harms associated with using drugs from the unregulated supply. In 2017, Health Canada responded, funding multiple drug checking services across the country with the primary goal of preventing overdose. This included funding a drug checking pilot in Toronto.

Toronto's drug checking service launched in October 2019 and offers free and anonymous drug checking using mass spectrometry technologies (gas- and liquid-chromatography). These lab-based technologies offer detailed information about which drugs are found in each sample, along with some information about how much of each drug is present.

Coordinated by the Centre on Drug Policy Evaluation, this drug checking service provides people who use drugs with timely and comprehensive information on the composition of their drugs, helping them to make more informed decisions. This drug checking service also helps to uncover the contents of Toronto's unregulated drug supply.

> ## What's the Unregulated Drug Supply?
>
> The unregulated drug supply includes illegal drugs, as well as legal drugs diverted from regulated markets for sale through criminal channels.

Samples are collected at three frontline harm reduction agencies in Toronto, including Parkdale Queen West Community Health Centre (Queen West site), South Riverdale Community Health Centre, and The Works at Toronto Public Health, where supervised consumption services are offered. However, this drug checking service is available to everyone and is not limited to clients of supervised consumption services.

Accepted samples include substances (a small amount of powder, a crushed bit of a pill, blotter, or a small amount of liquid) and post-use paraphernalia (a used cooker or filter, or leftover liquid from a syringe).

Samples are transported to a nearby laboratory at the Centre for Addiction and Mental Health or St. Michael's Hospital where they are analyzed. Results are available within the next business day or two and are communicated to clients by harm reduction staff in person or by phone. Along with these results, clients receive tailored harm reduction supports, guidance, and referral to services (e.g., supervised consumption, naloxone training, primary health care, etc.).

Every two weeks, results from samples checked are combined and disseminated with the goal of communicating information about the composition of Toronto's unregulated drug supply. To receive these reports directly, sign up by emailing drugchecking@cdpe.org.

This drug checking service is being scientifically evaluated to understand its impacts on the health and well-being of people who use drugs in Toronto. To learn more about the methods and aims of the evaluation, read the study protocol and rationale.

Drug Dictionary

Drug name	Description
2C class drugs	A family of psychedelic drugs
3-FA	An active amphetamine-related drug
6-MAM	An active heroin-related drug
Acetyl fentanyl	An active fentanyl-related drug
AEME	An inactive cocaine-related drug
Alprazolam (Xanax)	A medication used to treat anxiety
Amantadine	A medication used to treat influenza A infections and Parkinson's disease
AMB-FUBINACA	An "ultrapotent" synthetic cannabinoid
Benzoylecgonine	An inactive cocaine-related drug
Carfentanil	An "ultrapotent" fentanyl-related drug
Citalopram	A medication used to treat depression
Despropionyl fentanyl (4-ANPP)	An inactive fentanyl-related drug, which is an impurity found in fentanyl preparations
DOI	A potent psychedelic drug
Doxepin	A medication used to treat depression and anxiety
Etizolam	An active benzodiazepine-related drug
Fentanyl (hydroxy)	An inactive fentanyl-related drug
Flualprazolam	An active benzodiazepine-related drug
Flubromazolam	An active benzodiazepine-related drug
Furanyl UF-17	An opioid-related drug with unknown potency and effects
Levamisole	A medication used to treat worm infections in animals, pulled from the Canadian market in the early 2000s
Methylecgonine	An inactive cocaine-related drug
Norfentanyl	An inactive fentanyl-related drug
Phenacetin	A pain-relieving, fever-reducing medication, pulled from the Canadian market in the 1970s for its association with kidney and bladder cancers
Tropacocaine	An inactive cocaine-related drug

Results from Samples Checked

October 10, 2019 – March 31, 2020

Key Findings

Between October 10, 2019, when Toronto's drug checking service formally launched, and March 31, 2020:

- 543 samples were checked, including substances (63%) and post-use paraphernalia (37%).

- On average, 25 samples were checked each week.

- 46% of the samples checked were expected to be fentanyl.
    - Fentanyl was found in 93% of the samples that were expected to be fentanyl.
    - When other drugs were found with fentanyl, caffeine (87%) was most common.

- 43% of expected heroin samples contained no heroin.

- 96% of expected cocaine samples contained cocaine and other drugs, although other drugs most commonly found were cocaine-related.

- Samples expected to be opioids were more contaminated than other expected drug types – meaning there were a lot of other drugs found in each expected opioid sample. For example, 6% of expected fentanyl samples contained only fentanyl, while:
    - 86% of expected methamphetamine samples contained only methamphetamine.
    - 44% of expected MDMA samples contained only MDMA.
    - 77% of expected ketamine samples contained only ketamine.

- Unexpected noteworthy drugs were often found in Toronto's drug supply. For example:
    - Benzodiazepines and benzodiazepine-related drugs, like etizolam, flualprazolam, flubromazolam, and alprazolam, were unexpectedly found in 36% of expected fentanyl samples, which led to the [issuance of an alert by Toronto Public Health](#) given their presence and associated complications in overdose events.
    - AMB-FUBINACA was unexpectedly found in 3% of expected fentanyl samples.
    - Carfentanil was unexpectedly found in 1% of expected fentanyl samples.
    - Fentanyl was unexpectedly found in 43% of expected heroin samples.
    - Levamisole was unexpectedly found in 14% of expected cocaine samples.
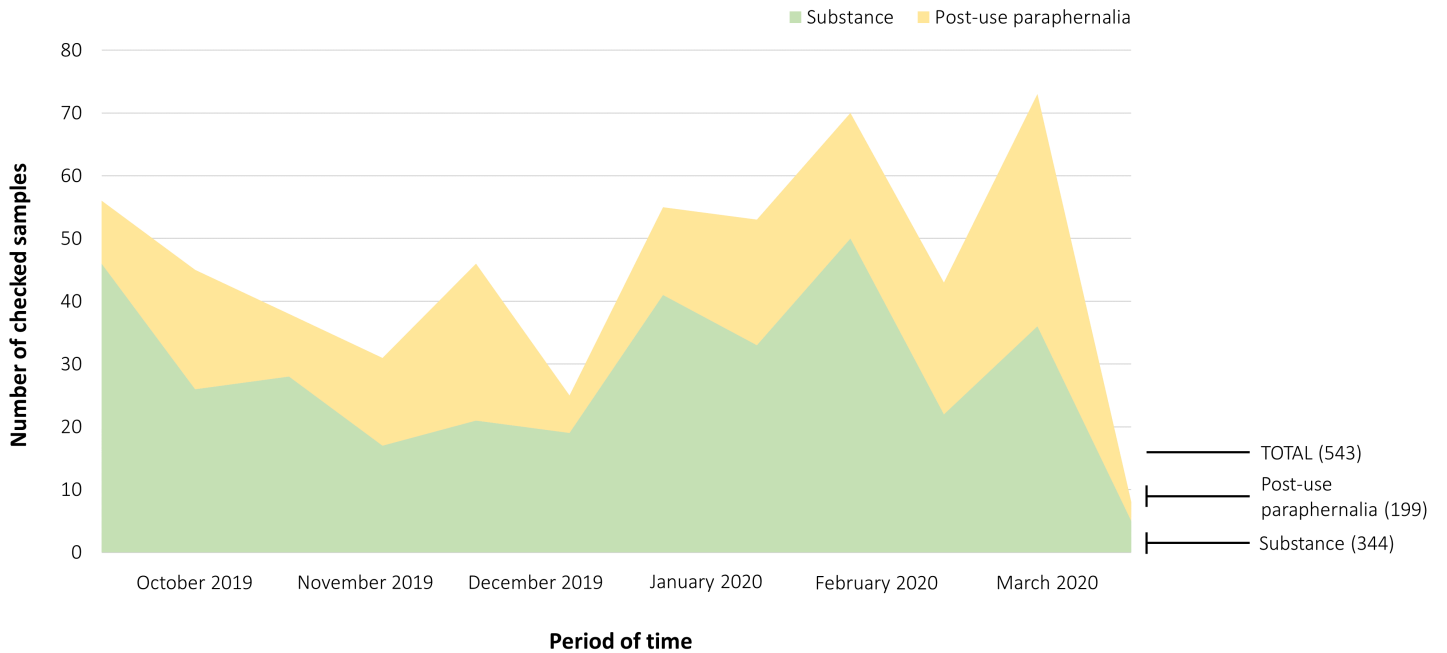
> ### What are Noteworthy Drugs?
>
> "Noteworthy drugs" are drugs that are highly potent, linked to overdose or other adverse effects, or may not be desired by some clients. Noteworthy drugs are called out when they are unexpectedly found in checked samples.
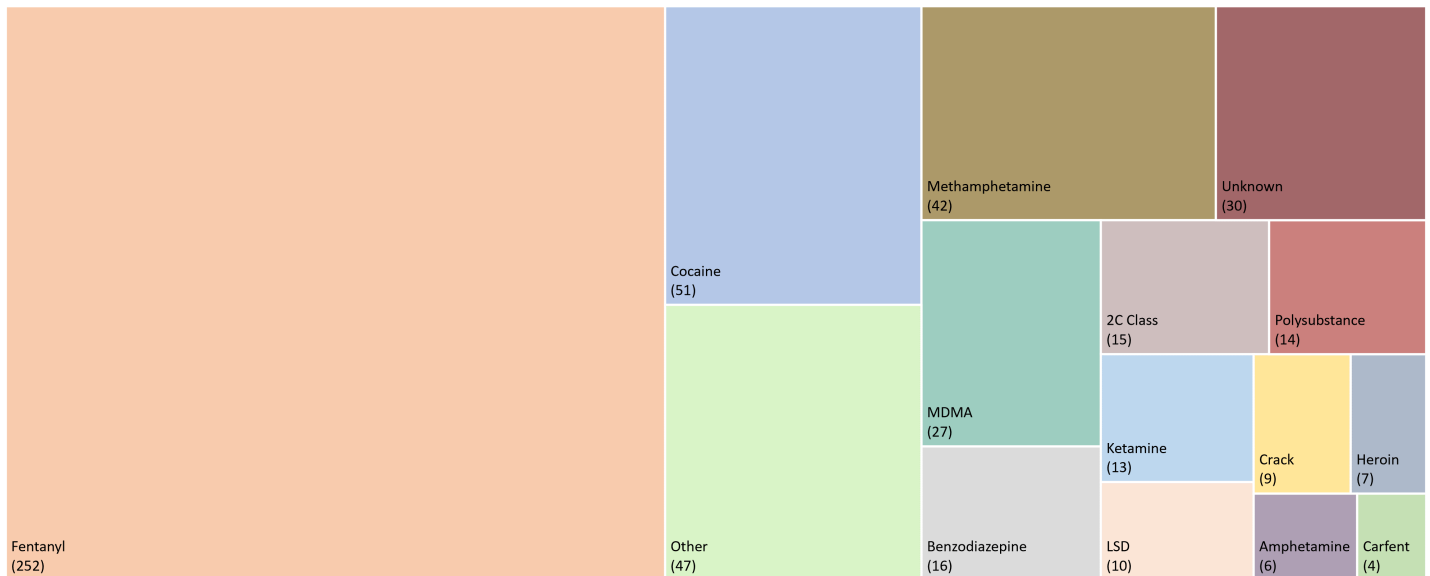
Checked Samples by Sample Type

Two types of samples are accepted by this drug checking service: substances (a small amount of powder, a crushed bit of a pill, blotter, or a small amount of liquid) and post-use paraphernalia (a used cooker or filter, or leftover liquid from a syringe).

Between October 10, 2019, and March 31, 2020, 543 samples were checked: 63% (344) were substances and 37% (199) were post-use paraphernalia.

Checked Samples by Expected Drug

When a client submits a sample to be checked, they indicate which drug they expect that sample to contain. The following shows which drugs were expected for the 543 samples checked between October 10, 2019, and March 31, 2020.

Other expected drugs included: 3 MEO-PCE, 4-AcO-DET, 4-AcO-DMT, 4-AcO-MET, 4-FA, 4-HO-MET, 4-HO-MiPT, 5-APB, 5-MeO-DiPT, 5-MeO-DMT, 5-MeO-MIPT, ADMK4, AMT, caffeine, DMT, freebase DMT, fumarate DOM, down, DPT, etaqualone, GHB, HDIK4, MDA, mescaline, methandrostenolone, MIPLA, modafinil, O-desmethyltramadol, O-PCE, Percocet, testosterone enanthate, tsunami, Viagra, and Z drug.

Unknown includes samples that did not have a stated expected drug.

Polysubstance includes samples that had two or more expected drugs (e.g., fentanyl and methamphetamine).
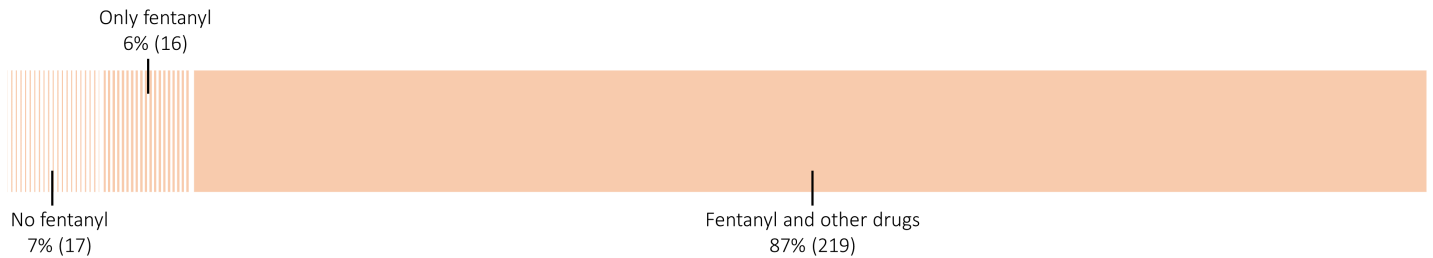
Opioids

Expected Fentanyl Samples

Of the 543 samples checked between October 10, 2019, and March 31, 2020, 46% (252) were expected to be fentanyl (36% were substances and 64% were post-use paraphernalia).
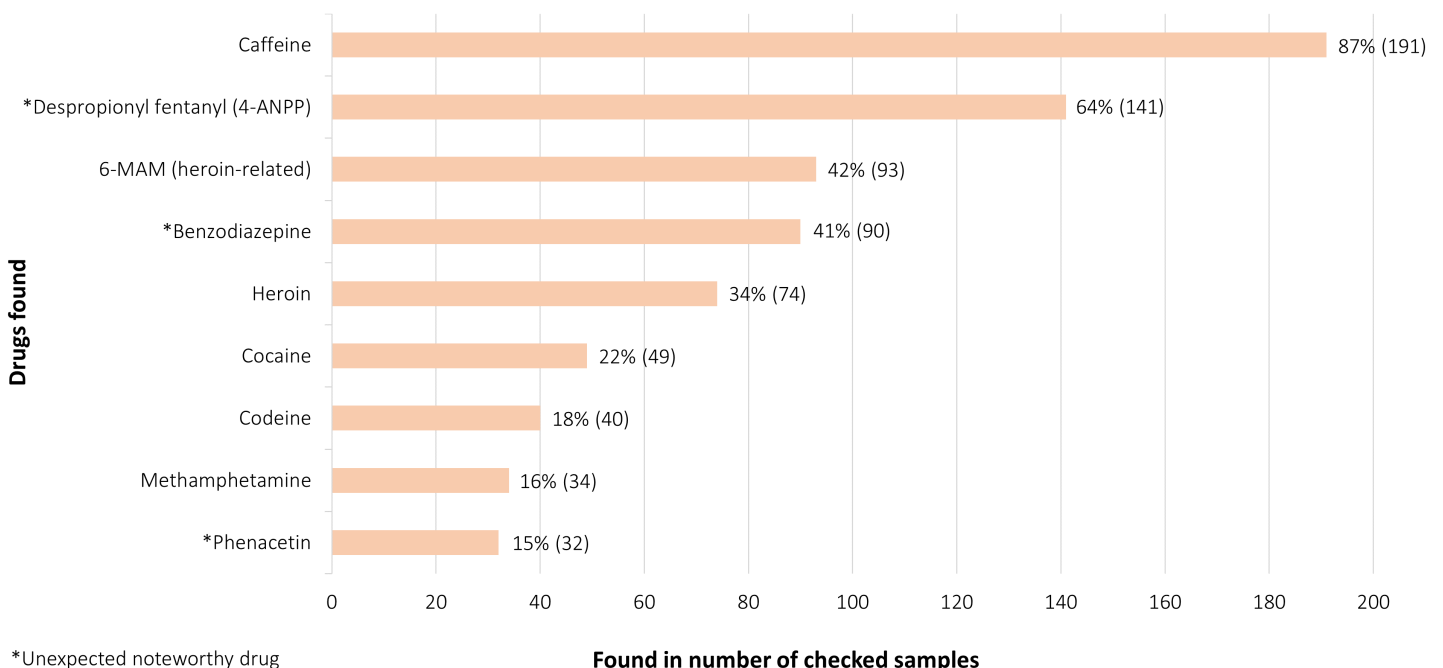
Presence of fentanyl in expected fentanyl samples (252)

Only fentanyl
6% (16)

No fentanyl
7% (17)

Fentanyl and other drugs
87% (219)

In samples expected to be fentanyl that **contained no fentanyl**, the most commonly found drugs included: caffeine, methamphetamine, cocaine, hydromorphone, and naproxen.

Expected fentanyl samples containing fentanyl and other drugs (219)

Of the 252 samples expected to be fentanyl, 87% (219) **contained fentanyl and other drugs**. The following shows which other drugs were found in expected fentanyl samples that contained fentanyl and other drugs and in what number of samples.

Drugs found	Found in number of checked samples
Caffeine	87% (191)
*Despropionyl fentanyl (4-ANPP)	64% (141)
6-MAM (heroin-related)	42% (93)
*Benzodiazepine	41% (90)
Heroin	34% (74)
Cocaine	22% (49)
Codeine	18% (40)
Methamphetamine	16% (34)
*Phenacetin	15% (32)

*Unexpected noteworthy drug

Note: More than one drug may be found in each sample so percentages may add up to more than 100%.

Unexpected noteworthy drugs in expected fentanyl samples (252)

"Noteworthy drugs" are drugs that are highly potent, linked to overdose or other adverse effects, or may not be desired by some clients. Noteworthy drugs are called out when they are unexpectedly found in checked samples. Of the 252 samples expected to be fentanyl, unexpected noteworthy drugs found included:

- 56% (141) of expected fentanyl samples contained despropionyl fentanyl (4-ANPP)
- 36% (91) of expected fentanyl samples contained one or more benzodiazepine or benzodiazepine-related drug:
    - 33% (83) of expected fentanyl samples contained etizolam
    - 15% (37) of expected fentanyl samples contained flualprazolam
    - 1% (3) of expected fentanyl samples contained flubromazolam
    - 1% (2) of expected fentanyl samples contained alprazolam
- 13% (33) of expected fentanyl samples contained phenacetin
- 7% (17) of expected fentanyl samples contained acetyl fentanyl
- 6% (15) of expected fentanyl samples contained fentanyl (hydroxy)
- 5% (13) of expected fentanyl samples contained furanyl UF-17
- 3% (8) of expected fentanyl samples contained norfentanyl
- 3% (7) of expected fentanyl samples contained AMB-FUBINACA
- 1% (2) of expected fentanyl samples contained carfentanil

Expected Heroin Samples

Of the 543 samples checked between October 10, 2019, and March 31, 2020, 1% (7) were expected to be heroin (57% were substances and 43% were post-use paraphernalia).
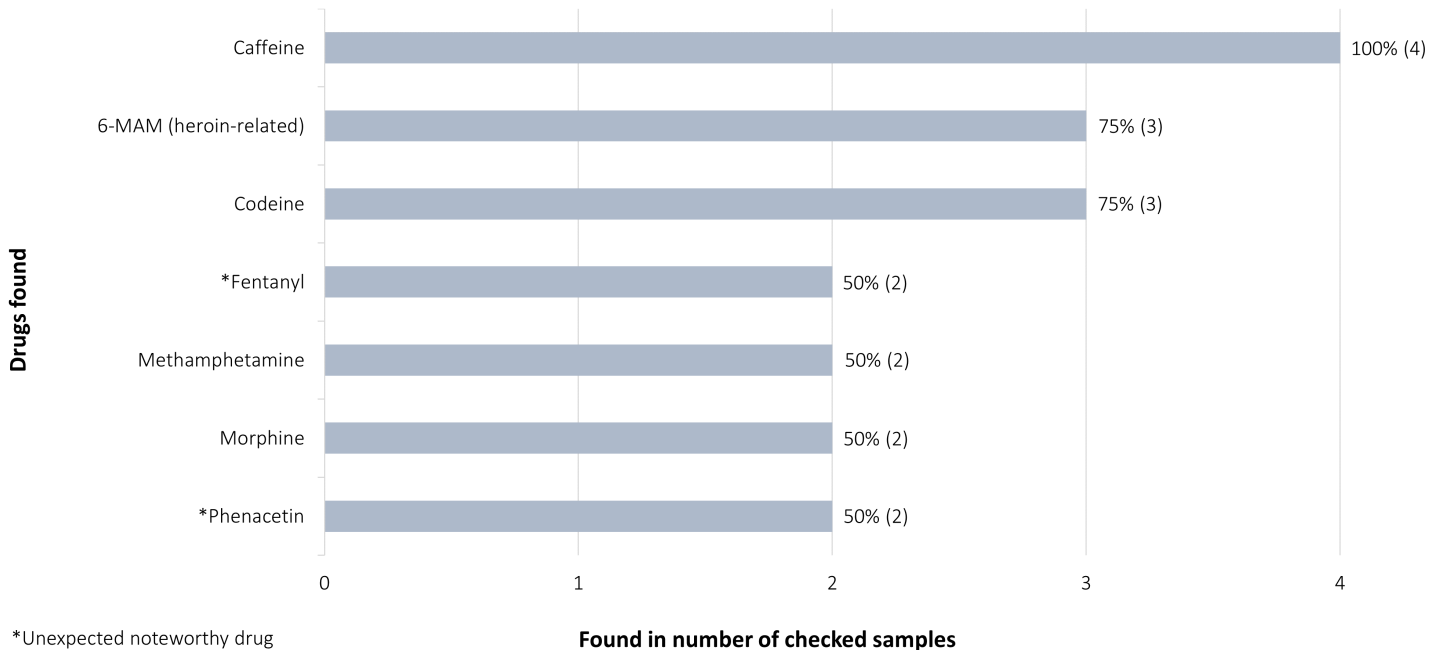
Presence of heroin in expected heroin samples (7)

No heroin
43% (3)

Heroin and other drugs
57% (4)

In samples expected to be heroin that **contained no heroin**, the most commonly found drugs included: 6-MAM (heroin-related), caffeine, codeine, morphine, fentanyl, and phenacetin.

Expected heroin samples containing heroin and other drugs (4)

Of the 7 samples expected to be heroin, 57% (4) **contained heroin and other drugs**. The following shows which other drugs were found in expected heroin samples that contained heroin and other drugs and in what number of samples.

Drugs found

Caffeine	100% (4)
6-MAM (heroin-related)	75% (3)
Codeine	75% (3)
*Fentanyl	50% (2)
Methamphetamine	50% (2)
Morphine	50% (2)
*Phenacetin	50% (2)

0   1   2   3   4

*Unexpected noteworthy drug

Found in number of checked samples

Note: More than one drug may be found in each sample so percentages may add up to more than 100%.

Unexpected noteworthy drugs in expected heroin samples (7)

"Noteworthy drugs" are drugs that are highly potent, linked to overdose or other adverse effects, or may not be desired by some clients. Noteworthy drugs are called out when they are unexpectedly found in checked samples. Of the 7 samples expected to be heroin, unexpected noteworthy drugs found included:
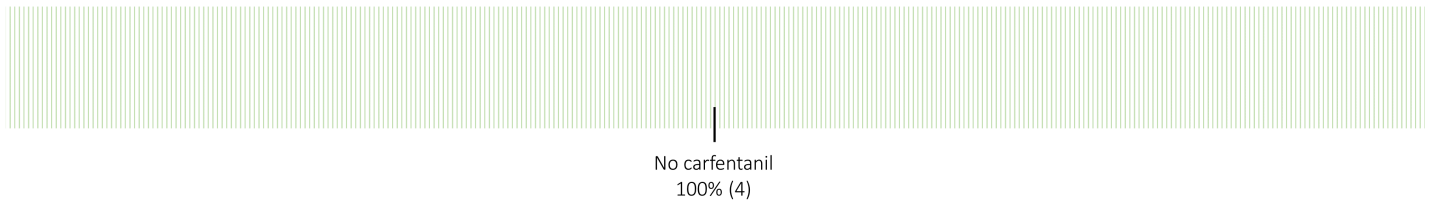
- 43% (3) of expected heroin samples contained fentanyl
- 43% (3) of expected heroin samples contained phenacetin
- 29% (2) of expected heroin samples contained despropionyl fentanyl (4-ANPP)

Expected Carfentanil Samples

Of the 543 samples checked between October 10, 2019, and March 31, 2020, 1% (4) were expected to be carfentanil (75% were substances and 25% were post-use paraphernalia).

Presence of carfentanil in expected carfentanil samples (4)

No carfentanil
100% (4)

In samples expected to be carfentanil that **contained no carfentanil**, the most commonly found drugs included: fentanyl, despropionyl fentanyl (4-ANPP), and furanyl UF-17.

Unexpected noteworthy drugs in expected carfentanil samples (4)

"Noteworthy drugs" are drugs that are highly potent, linked to overdose or other adverse effects, or may not be desired by some clients. Noteworthy drugs are called out when they are unexpectedly found in checked samples. Of the 4 samples expected to be carfentanil, unexpected noteworthy drugs found included:
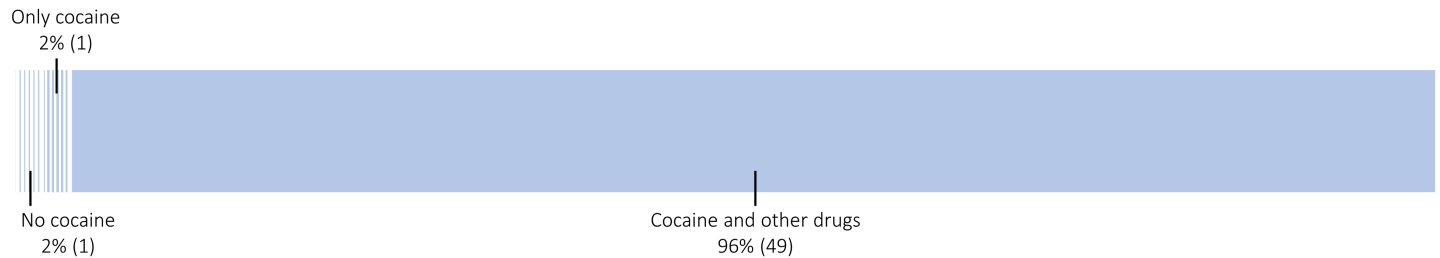
- 75% (3) of expected carfentanil samples contained fentanyl
- 25% (1) of expected carfentanil samples contained despropionyl fentanyl (4-ANPP)
- 25% (1) of expected carfentanil samples contained furanyl UF-17

Stimulants

Expected Cocaine Samples

Of the 543 samples checked between October 10, 2019, and March 31, 2020, 9% (51) were expected to be cocaine (96% were substances and 4% were post-use paraphernalia).

Presence of cocaine in expected cocaine samples (51)

Only cocaine
2% (1)

No cocaine
2% (1)

Cocaine and other drugs
96% (49)

In samples expected to be cocaine that **contained no cocaine**, the most commonly found drugs included: acetaminophen.

Expected cocaine samples containing cocaine and other drugs (49)

Of the 51 samples expected to be cocaine, 96% (49) **contained cocaine and other drugs**. Other drugs found included:

- 90% (44) of expected cocaine samples contained benzoylecgonine (cocaine-related)
- 16% (8) of expected cocaine samples contained AEME (cocaine-related)
- 16% (8) of expected cocaine samples contained phenacetin
- 14% (7) of expected cocaine samples contained levamisole

Note: More than one drug may be found in each sample so percentages may add up to more than 100%.

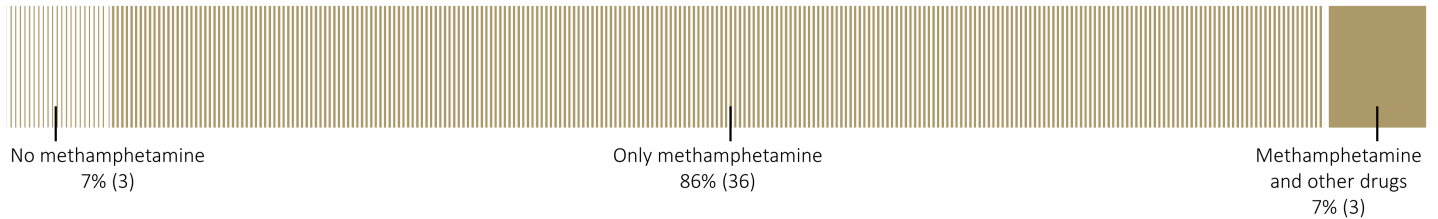**Unexpected noteworthy drugs in expected cocaine samples (51)**

"Noteworthy drugs" are drugs that are highly potent, linked to overdose or other adverse effects, or may not be desired by some clients. Noteworthy drugs are called out when they are unexpectedly found in checked samples. Of the 51 samples expected to be cocaine, unexpected noteworthy drugs found included:

- 16% (8) of expected cocaine samples contained phenacetin
- 14% (7) of expected cocaine samples contained levamisole

Expected Methamphetamine Samples

Of the 543 samples checked between October 10, 2019, and March 31, 2020, 8% (42) were expected to be methamphetamine (86% were substances and 14% were post-use paraphernalia).

Presence of methamphetamine in expected methamphetamine samples (42)

No methamphetamine 7% (3)	Only methamphetamine 86% (36)	Methamphetamine and other drugs 7% (3)

In samples expected to be methamphetamine that **contained no methamphetamine**, the most commonly found drugs included: cocaine and AEME (cocaine-related).

Expected methamphetamine samples containing methamphetamine and other drugs (3)

Of the 42 samples expected to be methamphetamine, 7% (3) **contained methamphetamine and other drugs**. Other drugs found included:

- 67% (2) of expected methamphetamine samples contained cocaine

- 67% (2) of expected methamphetamine samples contained benzoylecgonine (cocaine-related)

Note: More than one drug may be found in each sample so percentages may add up to more than 100%.

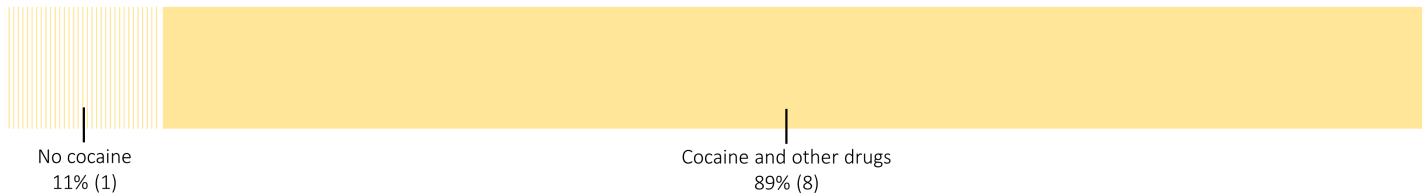## Unexpected noteworthy drugs in expected methamphetamine samples (42)

"Noteworthy drugs" are drugs that are highly potent, linked to overdose or other adverse effects, or may not be desired by some clients. Noteworthy drugs are called out when they are unexpectedly found in checked samples. Of the 42 samples expected to be methamphetamine, unexpected noteworthy drugs found included:

- 5% (2) of expected methamphetamine samples contained fentanyl

- 2% (1) of expected methamphetamine samples contained despropionyl fentanyl (4-ANPP)

- 2% (1) of expected methamphetamine samples contained phenacetin

Expected Crack Samples

Of the 543 samples checked between October 10, 2019, and March 31, 2020, 2% (9) were expected to be crack (56% were substances and 44% were post-use paraphernalia).

Presence of cocaine in expected crack samples (9)

No cocaine
11% (1)

Cocaine and other drugs
89% (8)

In samples expected to be crack that **contained no cocaine**, the most commonly found drugs included: oxycodone.

Expected crack samples containing cocaine and other drugs (8)

Of the 9 samples expected to be crack, 89% (8) **contained cocaine and other drugs**. Other drugs found included:

- 50% (4) of expected crack samples contained methylecgonine (cocaine-related)
- 38% (3) of expected crack samples contained benzoylecgonine (cocaine-related)
- 38% (3) of expected crack samples contained tropacocaine (cocaine-related)
- 25% (2) of expected crack samples contained AEME (cocaine-related)
- 25% (2) of expected crack samples contained phenacetin

Note: More than one drug may be found in each sample so percentages may add up to more than 100%.

Unexpected noteworthy drugs in expected crack samples (9)

"Noteworthy drugs" are drugs that are highly potent, linked to overdose or other adverse effects, or may not be desired by some clients. Noteworthy drugs are called out when they are unexpectedly found in checked samples. Of the 9 samples expected to be crack, unexpected noteworthy drugs found included:
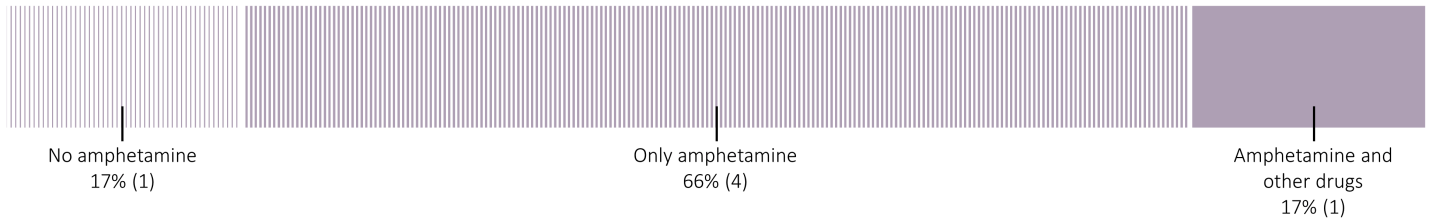
- 22% (2) of expected crack samples contained phenacetin
- 11% (1) of expected crack samples contained fentanyl

Expected Amphetamine Samples

Of the 543 samples checked between October 10, 2019, and March 31, 2020, 1% (6) were expected to be amphetamine (all were substances).

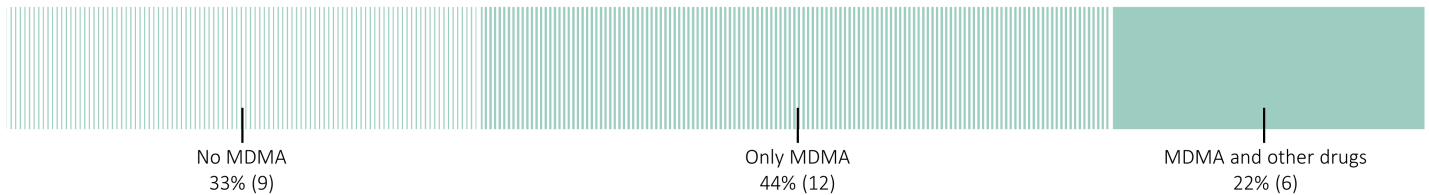**Presence of amphetamine in expected amphetamine samples (6)**

No amphetamine	Only amphetamine	Amphetamine and other drugs
17% (1)	66% (4)	17% (1)

In samples expected to be amphetamine that **contained no amphetamine** or **contained amphetamine and other drugs**, the most commonly found drugs included: methamphetamine.

Psychedelics

Expected MDMA Samples

Of the 543 samples checked between October 10, 2019, and March 31, 2020, 5% (27) were expected to be MDMA (all were substances).

Presence of MDMA in expected MDMA samples (27)

No MDMA	Only MDMA	MDMA and other drugs
33% (9)	44% (12)	22% (6)

In samples expected to be MDMA that **contained no MDMA**, the most commonly found drugs included: MDA and caffeine.

Expected MDMA samples containing MDMA and other drugs (6)

Of the 27 samples expected to be MDMA, 22% (6) **contained MDMA and other drugs**. Other drugs found included:

• 67% (4) of expected MDMA samples contained MDA

• 33% (2) of expected MDMA samples contained acetaminophen

Expected 2C Class Samples

Of the 543 samples checked between October 10, 2019, and March 31, 2020, 3% (15) were expected to be a 2C class drug (all were substances).

Expected 2C class drugs included 2C-B, 2C-C, 2C-D, 2C-E, 2C-I, 2C-P, and 2C-T-2.

Presence of 2C class drugs in expected 2C class samples (15)

No 2C class drugs	Only 2C class drugs	2C class drugs and other drugs
20% (3)	27% (4)	53% (8)

In samples expected to be a 2C class drug that **contained no 2C class drug**, the most commonly found drugs included: ketamine and caffeine.

Expected 2C class samples containing 2C class drugs and other drugs (8)

Of the 15 samples expected to be a 2C class drug, 53% (8) **contained a 2C class drug and other drugs**. Other drugs found included:
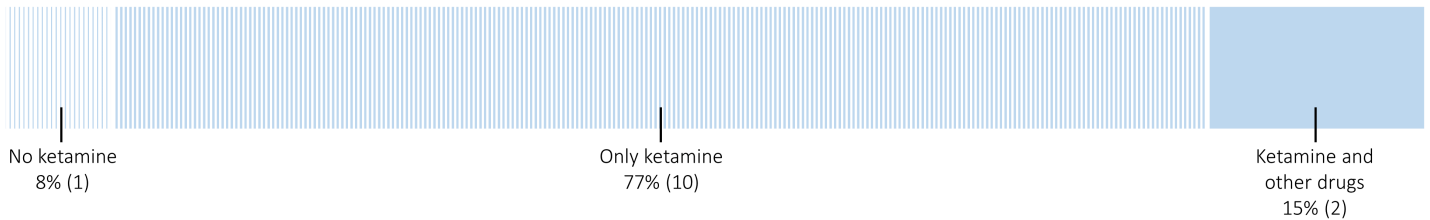
- 50% (4) of expected 2C class drug samples contained an unknown 2C class-related drug

- 38% (3) of expected 2C class drug samples contained citalopram

- 25% (2) of expected 2C class drug samples contained ketamine

Note: More than one drug may be found in each sample so percentages may add up to more than 100%.

Expected Ketamine Samples

Of the 543 samples checked between October 10, 2019, and March 31, 2020, 2% (13) were expected to be ketamine (all were substances).

Presence of ketamine in expected ketamine samples (13)

No ketamine
8% (1)

Only ketamine
77% (10)

Ketamine and
other drugs
15% (2)

In samples expected to be ketamine that **contained no ketamine**, the most commonly found drugs included: MDMA.

Expected ketamine samples containing ketamine and other drugs (2)

Of the 13 samples expected to be ketamine, 15% (2) **contained ketamine and other drugs**. Other drugs found included:
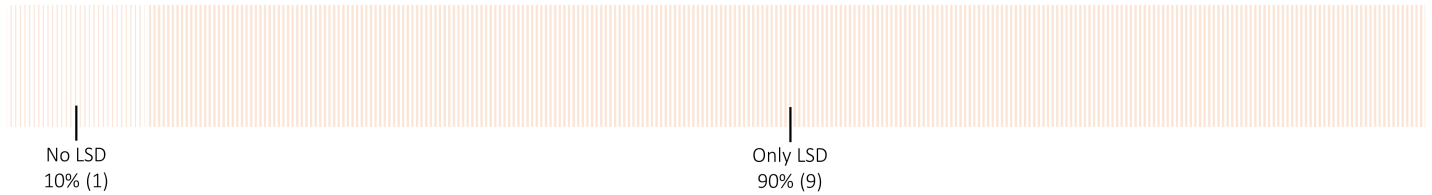
• 50% (1) of expected ketamine samples contained 3-FA

• 50% (1) of expected ketamine samples contained acetaminophen

Expected LSD Samples

Of the 543 samples checked between October 10, 2019, and March 31, 2020, 2% (10) were expected to be LSD (all were substances).

Presence of LSD in expected LSD samples (10)

No LSD
10% (1)

Only LSD
90% (9)

In samples expected to be LSD that **contained no LSD**, the most commonly found drugs included: DOI.

Depressants

Expected Benzodiazepine Samples

Of the 543 samples checked between October 10, 2019, and March 31, 2020, 3% (16) were expected to be a benzodiazepine or a benzodiazepine-related drug (all were substances).

Expected benzodiazepine and benzodiazepine-related drugs included alprazolam, etizolam, flualprazolam, and flubromazolam.

Presence of benzodiazepines and benzodiazepine-related drugs in expected benzodiazepine samples (16)

Only benzodiazepines or benzodiazepine-related drugs
44% (7)

Benzodiazepines or benzodiazepine-related drugs and other drugs
56% (9)

Expected benzodiazepine samples containing a benzodiazepine or benzodiazepine-related drug and other drugs (9)

Of the 16 samples expected to be a benzodiazepine or benzodiazepine-related drug, 56% (9) **contained a benzodiazepine or benzodiazepine-related drug**. Other drugs found included:

- 44% (4) of expected benzodiazepine samples contained caffeine
- 33% (3) of expected benzodiazepine samples contained amantadine
- 33% (3) of expected benzodiazepine samples contained doxepin
- 22% (2) of expected benzodiazepine samples contained hydromorphone

Note: More than one drug may be found in each sample so percentages may add up to more than 100%.

Unexpected noteworthy drugs in expected benzodiazepine samples (16)

"Noteworthy drugs" are drugs that are highly potent, linked to overdose or other adverse effects, or may not be desired by some clients. Noteworthy drugs are called out when they are unexpectedly found in checked samples. Of the 16 samples expected to be a benzodiazepine, unexpected noteworthy drugs found included:

- 6% (1) of expected benzodiazepine samples contained fentanyl

Limitations of Toronto's Drug Checking Service

It is important to understand the limitations of this drug checking service:

1. Checking a sample cannot guarantee that a drug is safe to use.

2. The results from a sample may not represent the rest of the drugs that sample was taken from. This is known as the Chocolate Chip Cookie Effect.

3. There are technological limitations:
   a. Some drugs may be missed.
   b. Non-drug fillers are not reported. This could include non-drug fillers that may be dangerous, such as bacteria, metals, pesticides, or inorganic salts. Other non-drug fillers may not be dangerous, such as sugar or laxatives.

4. Results for samples that are taken from post-use paraphernalia have other limitations:
   a. Paraphernalia, like cookers, are often re-used. The mass spectrometry technologies used for this drug checking service (gas- and liquid-chromatography) are so sensitive that very trace amounts of drugs may be found. This means that when paraphernalia is re-used, drugs from past use may present in the results for the sample that is being checked.
   b. Fatty acids are more commonly found in samples that are taken from post-use paraphernalia, most likely from oils on skin. These fatty acids can interfere with the mass spectrometry analysis. It may be difficult to see past them to determine which drugs are present.

For these reasons, checking substances instead of post-use paraphernalia is preferred.

What's the Chocolate Chip Cookie Effect?

The results for a sample that is checked may not represent the rest of the drugs that sample was taken from. You can imagine your drugs as a chocolate chip cookie. If you check a piece of the cookie that is only dough, your results may not identify chocolate as present. Mixing a powder or scratching different parts of a pill when preparing a sample can increase the representativeness of your sample.

Acknowledgements

Special thanks from the Centre on Drug Policy Evaluation to the Community Advisory Board, a group of ten people who use drugs in Toronto that meet monthly to consult on the design and execution of this drug checking service.

We wish to remember all the lives that have been lost – both in the ongoing overdose crisis and long before – due to a lack of regulation of the drugs described herein. Our work is dedicated to the community members who are no longer with us, including those who directly contributed to this project. May their deaths not have been in vain.

The Centre on Drug Policy Evaluation strives to improve community health and safety by conducting research and outreach on best practices in drug policy. We work collaboratively with governments, affected communities, and civil society to guide effective and evidence-based policy responses to substance use. The Centre on Drug Policy Evaluation is now housed within the Li Ka Shing Knowledge Institute at St. Michael's Hospital, a site of Unity Health Toronto, in Toronto, Canada.

Learn more about Toronto's drug checking service. Like us on Facebook, facebook.com/centreondrugpolicyevaluation, and follow us on Twitter, @drugpolicyctr.

Questions or comments? We'd love to hear from you. You can reach us at drugchecking@cdpe.org.