BRITISH COLUMBIA CENTRE ON SUBSTANCE USE

Networking researchers, educators & care providers

Trends in drug checking results

across British Columbia

January to December 2023

October 2024

Land Acknowledgement

The BC Centre on Substance Use would like to respectfully acknowledge that the land on which we work is the unceded ancestral homelands of the xwmekwey'em (Musqueam), Skwxwú7mesh (Squamish), and sel'ílweta| (Tsleil-Waututh) Nations.

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Contact

Learn more on www.drugcheckingbc.ca. For further drug checking-related inquiries, please reach out to us through our general mailbox, drugchecking@bccsu.ubc.ca.

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Purpose of the Report

This report is written to provide an overview of the substances checked at community drug checking sites across British Columbia (BC) in 2023. The data have been analyzed by health authority region and by drug category in order to examine any trends in the unregulated drug supply that may be region, or category-dependent. The drug categories used were: opioids, depressants, stimulants, psychedelics, other, polysubstance, and unknown.

Specific substances, such as the detection of benzodiazepines, xylazine, and fluorofentanyl, were highlighted in the analysis to better understand the changes in adulteration of the unregulated opioid supply throughout the year. Additionally, expected-pharmaceutical opioids that did not contain the expected active substances were also highlighted in this report, as concern around counterfeit pharmaceutical opioids became topical throughout the year.

The data were collected at drug checking access sites that use a Fourier-transform infrared (FTIR) spectrometer in combination with fentanyl and benzodiazepine immunoassay strips.

Community Drug Checking Organizations

Listed below are a list of the organizations that offered drug checking services in community sites in the 2023 calendar year and the data in this report includes drug checking results collected at those locations.

ANKORS
ASK Wellness
CMHA Mid-Island
Fraser Health Authority
Get Your Drugs Tested
Interior Health Authority
Insite
Island Health Authority
LIFT Community Services
Mountainside Harm Reduction Society
Northern Health Authority
Portland Hotel Society
POUNDS Project
Progressive Housing
Purpose Society
RainCity Housing
Sources Community Resources Society
Tla'amin Nation
University of British Columbia-Okanagan
Vancouver Coastal Health Authority
Vernon Medicine Shoppe Pharmacy
Whistler Community Service Society

List of Acronyms and Other Frequently Used Terms

BC:	British Columbia
Buffs:	Inert compounds that are added to the final product to increase size or bulk
Cuts:	Psychoactive or pharmacologically active compounds that mimic or enhance the effects of the intended drug in the substance
"Down":	Colloquial term used for drugs expected to contain an unknown opioid, with fentanyl or heroin most commonly expected. In this report, "down" is a category of unregulated opioids used to capture those samples purchased or obtained as "down" rather than a specific expected opioid.
DTES:	Vancouver's Downtown Eastside neighbourhood
Expected drug:	An individual's expectation of what the drug is prior to the drug check. Samples are considered concordant if the expected drug is present, based on the FTIR or immunoassay strip result
FTIR:	Fourier-transform Infrared Spectrometry
OPS:	Overdose Prevention Site
SCS:	Supervised Consumption Site
Uncertain Match:	A result option used to denote when a possible compound(s) is suspected to be in a sample, but it is uncertain which is present. Technicians log this result when there are residual peaks that have not been accounted for in a spectra during FTIR analysis
Unregulated Opioids:	Term used in the data analysis to refer to samples expected to contain opioids and are categorized as fentanyl, heroin, fentanyl and heroin, and/or "down", unless otherwise noted

Tables and Figures

Summary of Key Findings

2023 saw an increase in drug checking service utilization from 2022:

- A total 29,078 samples were checked in 2023, with June having the most samples checked in one month (2,912 samples).
- The number of samples checked in 2023 is a 478% increase from the first full year of drug checking services operating in BC in 2019.
- Over the course of 2023, a total of 96 unique drug checking access points offered sample drop off and/or on-site testing across BC, with a peak of 48 locations accessed in the month of December 2023.
- All of the drug categories increased in the number of samples checked across the year compared to data collected in 2022, indicating greater service utilization overall.

Opioids were the most checked drug category, and showed a continued trend of variability and unpredictability:

- A total of 11,606 opioid samples were checked in 2023, with the most common opioid checked being “down” (7,578 total samples).
- The median fentanyl concentration of unregulated expected-opioid samples increased overall in BC in 2023, with the highest concentrations observed in the Vancouver Coastal and Fraser Health regions.
- Fluorofentanyl detection increased among unregulated opioid samples in the first half of the year, nearing on par with fentanyl detection in June before decreasing in the second half of 2023.
- Detection of xylazine among unregulated opioid samples remained low overall (1.4% of all unregulated opioids in 2023). The true number of xylazine-positive samples is likely higher as when xylazine is present, it is often in concentrations below the detection limit of the FTIR.
- The number of benzodiazepine-positive opioids increased throughout the year. Bromazolam was detected in 688 unregulated opioid samples, and was the most frequently detected benzodiazepine by FTIR, replacing etizolam in 2022.
- The most common unexpected active ingredient found in non-concordant pharmaceutical opioids was fentanyl, as detected by FTIR and/or test strip.

Among the other drug categories:

- Benzodiazepines were the most frequent depressants checked, with expected-alprazolam samples contributing 36.0% to the overall total (458 samples).
- The stimulant category had the greatest proportion of concordance between the reported expected substance and the drug checking result, with 96.5% of samples checked containing the expected drug.
- The most common stimulant checked was cocaine, with a total of 2,972 expected-cocaine samples submitted for drug checking in 2023.
- MDMA was the most checked psychedelic throughout the year, with a total of 2,809 expected-MDMA samples submitted for drug checking.

Background

Since the drug toxicity crisis was first declared a public health emergency in British Columbia (BC) in 2016, point-of-care drug checking services have expanded in an effort to contend with an increasingly unpredictable unregulated drug supply. Drug checking provides an opportunity to not only engage with people accessing these services and offer important harm reduction information, but also provides valuable insight into the rapidly evolving unregulated drug supply. This report seeks to describe drug checking data trends observed throughout 2023 in BC.

Methods

The data presented in this report are drug checking samples collected between January 1, 2023 through December 31, 2023 from community drug checking sites across British Columbia, using Fourier-transform infrared (FTIR) spectroscopy in combination with both benzodiazepine and fentanyl immunoassay strips. The FTIR spectrometer is a device used at community drug checking sites that can determine the composition of a substance by shining infrared light at a sample and examining the resulting absorption spectrum.[1] Each compound has a unique absorption spectrum, which can be compared to drug reference libraries in order to identify up to six of the compounds present in a sample through a subtractive analysis. The technique is a non-destructive method, meaning that the sample can be returned to the individual after analysis is complete. While the FTIR is a cost- and time-effective method for checking substances, it has been found to have a detection threshold of 5-10%, which means that compounds must have a greater than 5-10% concentration in the sample in order to be consistently detected.[2]

Benzodiazepine and fentanyl immunoassay strips were both originally designed for use with urine samples, but have been validated for use in drug checking settings with non-urine samples.[2] The immunoassay strips detect the presence of the compound at a higher sensitivity compared to the FTIR spectrometer through selective antibodies that are reactive to the target compound, either fentanyl or benzodiazepines.[1,2,3] They can provide binary information about whether fentanyl or benzodiazepines are present in a sample, and have been found to also detect some analogs, but they do not quantify the concentration of the compound in the sample. Both the FTIR spectrometer and immunoassay strips together can provide drug checking results with both sensitivity and specificity to the compounds present in a sample.

Both fixed and 'pop-up' drug checking sites were included in the analysis. Drug checking at large multi-day music festivals (Bass Coast and Shambhala) were excluded, but pop-up drug checking services at smaller music festivals, such as Alitunes, Burn in the Forest, Laketown Shakedown, Sunfest, and Wicked Woods were included. Data from Bass Coast and Shambhala music festivals are available at https://drugchecking.ca/2023-festival-infographic/. Mail-in samples were also excluded from analysis, as their origin often cannot be confirmed.

The data were analyzed in two ways: 1) by health authority region, and 2) by drug categories in order to determine any trends that may be region or substance-specific. The data from regional

health authorities are categorized as: Vancouver Coastal Health, Fraser Health, Interior Health, Island Health, and Northern Health. Of note, data from Island Health in this report includes only one location that operates an FTIR spectrometer-based service. However, the University of Victoria drug checking project, Substance, reports on data from other communities across the Island Health region separately. These data are not included in this report as Substance uses different technologies and at this time the data are not harmonized for reporting purposes. For more information on the UVic Substance drug checking project, visit https://substance.uvic.ca/.

Drug categories were separated as opioids, depressants, stimulants, psychedelics, polysubstance, other, and unknown. Substances in the polysubstance category include samples where multiple active drugs were expected which fall into different categories (e.g., a sample containing an opioid and stimulant). The unknown category included samples where the person accessing the service did not know what the substance was prior to the substance being checked, and the other category included samples that did not fit into any of the previously mentioned drug categories.

We examined concordance among each drug category by comparing what drug the service user expected their sample to be with the drug checking results. Samples are considered concordant if the expected drug is determined to be present by FTIR, and/or in the case of expected-fentanyl/down or benzodiazepine samples, if a respective fentanyl or benzodiazepine test strip result was positive. We then examined the most frequently checked expected drugs within each drug category, and provided the components detected by FTIR. Given the increased concern over counterfeit pharmaceutical opioids throughout the year, we also examined non-concordant expected-pharmaceutical opioids samples. The analysis of expected-pharmaceutical opioids included the components detected in samples where the expected drug was not found present by FTIR, and instead another unexpected active ingredient was detected. Since active ingredients can be missed by FTIR in pills due to their presence in low concentrations, we also included fentanyl and benzodiazepine test strip results in the components list for expected-pharmaceutical opioids.

Within the opioid category, the subcategory “unregulated opioids” was defined as samples that were expected to contain fentanyl, heroin, fentanyl and heroin together, and/or “down”. “Down” is a colloquial term used to refer to a mixture of substances typically containing caffeine, a sugar (e.g., erythritol) and an opioid, generally fentanyl or heroin. Adulteration of, and changes to, the unregulated opioid supply were examined by the prevalence of select compounds–xylazine, benzodiazepines, and fluorofentanyl–each month to gain insight into any trends across the year. Both fentanyl and benzodiazepines were determined to be present or absent with a positive immunoassay strip, through identification with FTIR spectroscopy or both. The concentration of fentanyl in unregulated opioid samples was determined retrospectively using the Bruker Quantitative Analysis 2 (QUANT 2).[4,5] Fentanyl concentrations of samples were examined by month and by region in order to determine any trends in the province throughout the year.

For more information about drug checking services in BC and annual reports from previous years, visit www.drugcheckingbc.ca. The drug checking data collected from 2018 to present is also publicly available and can be viewed in an interactive overview at https://bccsu-drugsense.onrender.com/.

Results

Drug Checking Utilization

Samples Checked

In 2023, there were a total of 29,078 samples submitted for drug checking at sites across British Columbia over a total of 24,397 visits. Since the inception of drug checking services in 2017, the number of samples checked each year has grown exponentially (see **Figure 1**). The first 12 consecutive months of drug checking services operating in BC occurred in 2019, and had a total of 5,030 samples checked. The number of samples continued to rise each year through to 2023, representing a 478% increase in samples checked in 2023 compared to 2019.

Several factors could have contributed to this increase, including an increase in the number of sites and FTIR spectrometers conducting drug checking in the community, as well as increased public awareness of the service as it continues to expand across the province. Additionally, in January 2023, Health Canada implemented an exemption under the Controlled Drugs and Substances Act which decriminalized the possession of small amounts of some illicit drugs among adults in BC.[22] It is possible that the exemption may have reduced stigma towards accessing drug checking services, and could have contributed to the increase in samples checked seen throughout the year.

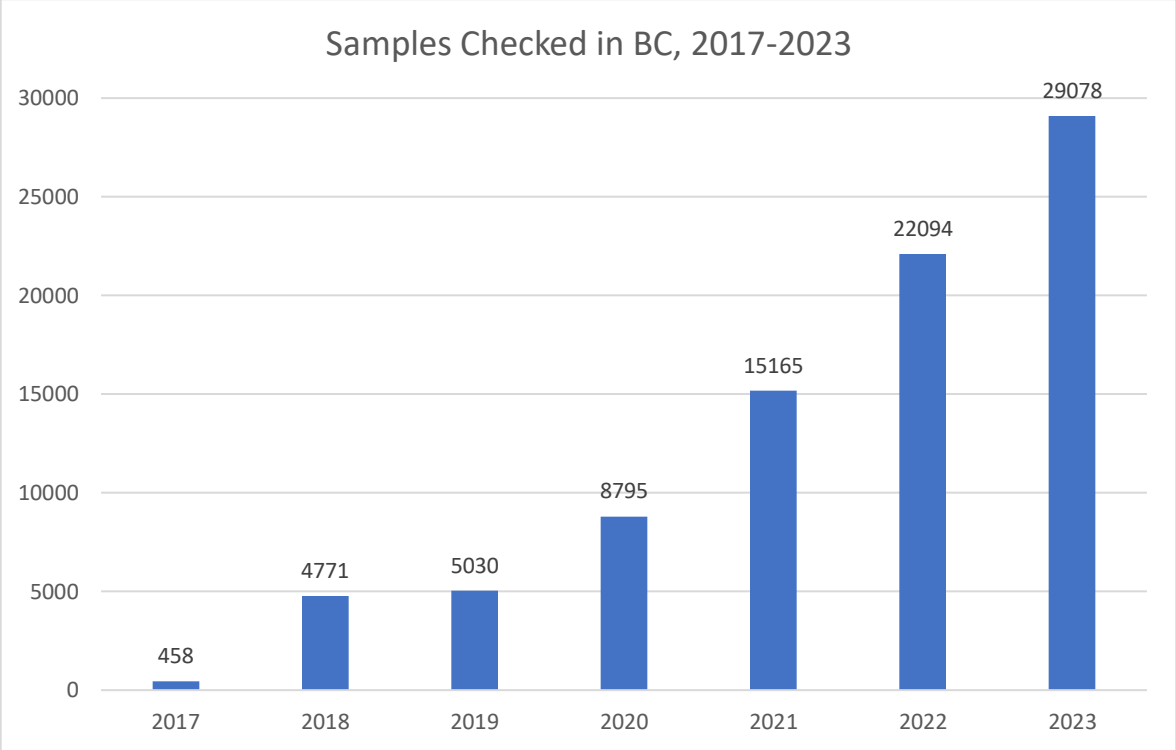

Figure 1. Bar graph of the total number of samples checked each year from 2017 through 2023 in BC

The number of samples checked per month increased throughout 2023, with 2,101 samples checked in January compared to 2,393 samples checked in December (see **Figure 2**). June had

the highest number of samples checked across the year, with a total of 2,912 samples checked. One explanation for this peak is the increase in drug checking service access through pop-up locations at music festivals during this time, and well as at community sites for music festival attendees prior to the events. The relatively low number of samples in January were a continuation of a dip in December 2022 (1973 samples), which could be due to services being disrupted over winter holidays. The low observed in October could be explained by the interruption of services at one of the sites in the Vancouver Coastal region.

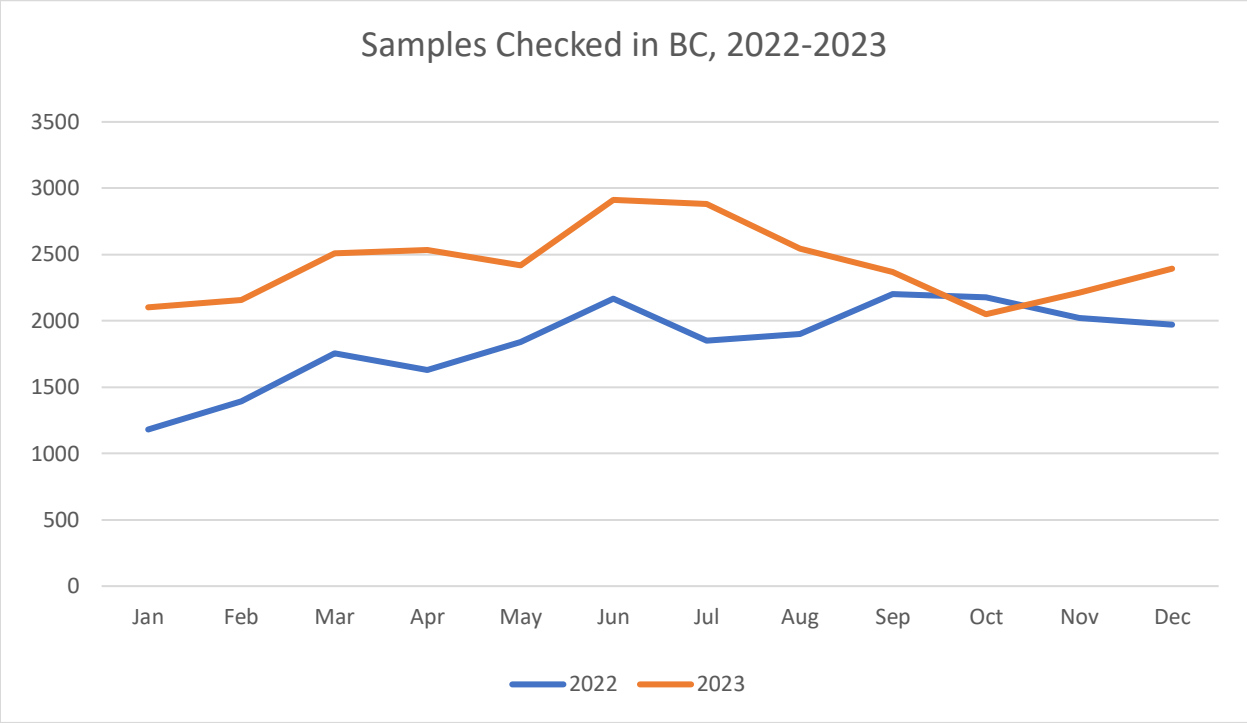

Figure 2. Line graph of the total number of samples checked across BC each month in 2022 vs. 2023

When comparing the 2022 to the 2023 drug checking data, all of the drug categories increased in the number of samples checked. The opioid category remained the most frequently checked category for both years and had a 34.9% increase in the number of samples checked in 2023 (see **Figure 3**).

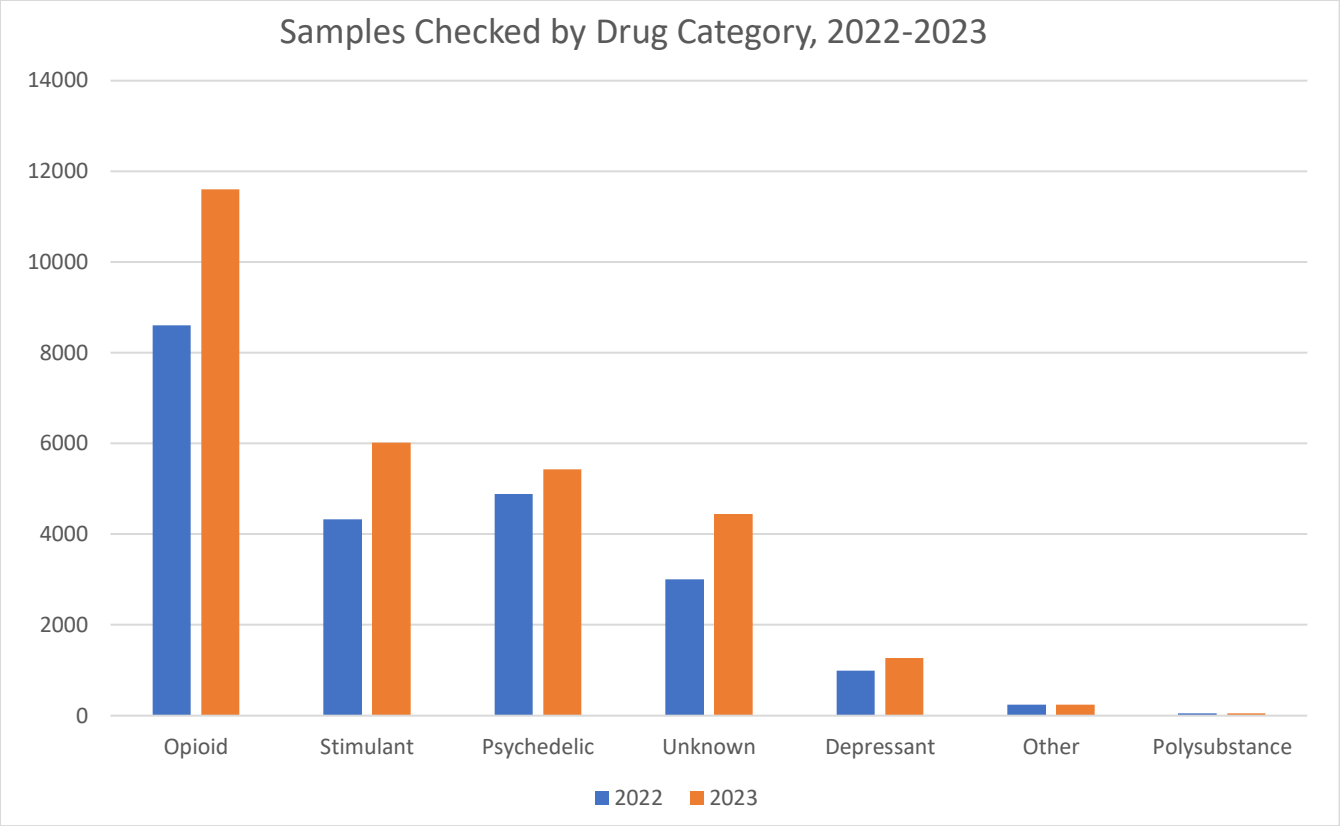

Figure 3. Bar graph comparison of the number of samples checked in 2022 vs. 2023 by substance category

Opioids were consistently the most frequently checked drug category throughout the year, with March (1,123 samples) and July (1,100 samples) having the greatest number of opioid samples checked by month (see **Figure 4**). Psychedelics and stimulants were the next two most frequently checked drug categories in 2023. The psychedelic category had the greatest number of samples checked next to opioids in June (667 samples) and July (731 samples), which could be a result of music festivals occurring during those months. In all other months, the stimulant category had the greatest number of samples checked next to opioids throughout the year. The polysubstance category remained significantly lower than all other categories, with less than 10 samples checked per month.

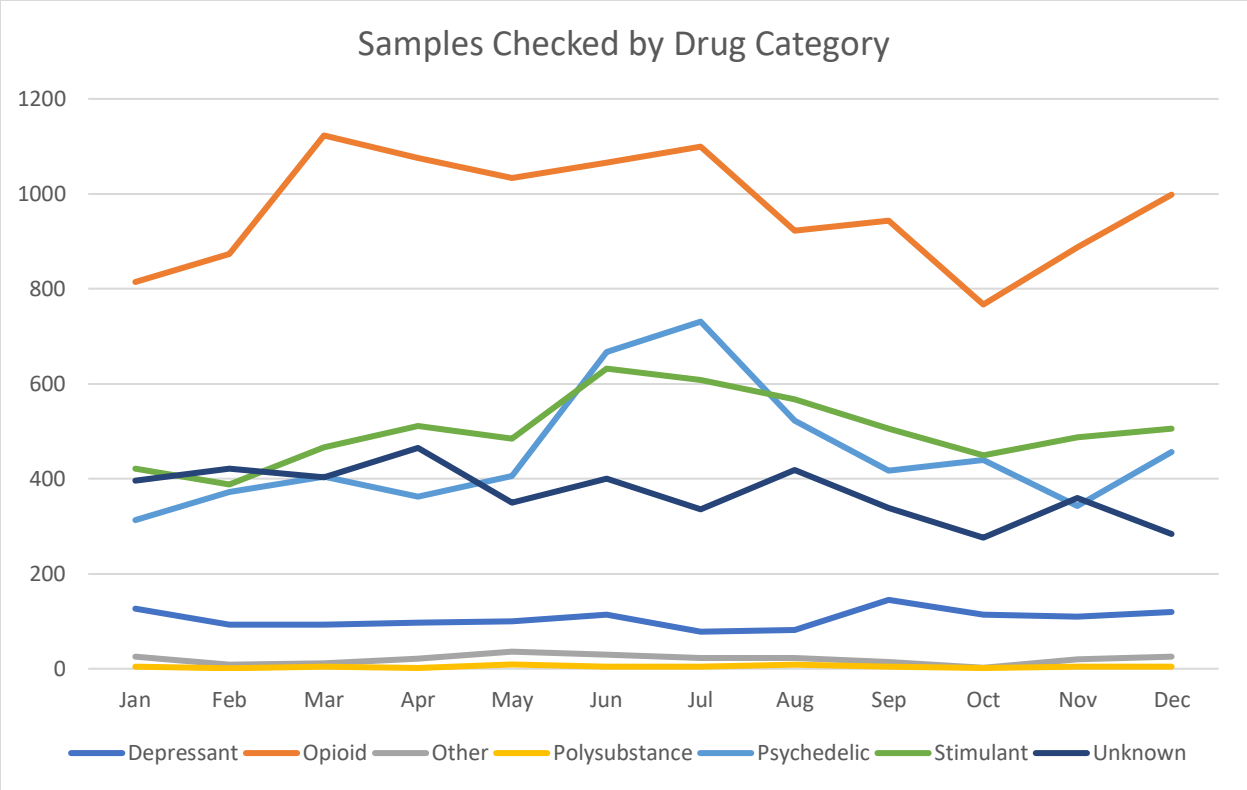

Figure 4. Total number of samples checked in each category across BC each month in 2023

When comparing the total samples checked between health authority regions, the Vancouver Coastal Health region consistently checked the greatest number of samples each month, with a peak in July of 1,944 samples checked (see **Figure 5**). One explanation is that the drug checking sites in the Vancouver Coastal Health region are predominantly located within the densely populated Vancouver downtown core, which could impact the number of individuals accessing the service in that region and lead to high volumes at each site. In particular, one of the Get Your Drugs Tested locations is located in the Vancouver DTES neighbourhood and provides drug checking services 7 days a week for 8 hours a day and with at least two FTIR spectrometers at all times, making drug checking services highly accessible in the area. The Interior Health region had the next highest number of samples checked per month across the year and had a peak in June, with 565 samples checked, corresponding to the pop-up drug checking sites available at smaller music festivals available in the region during that time. Services also expanded in the Fraser Health region, which tested the third highest number of samples throughout the year.

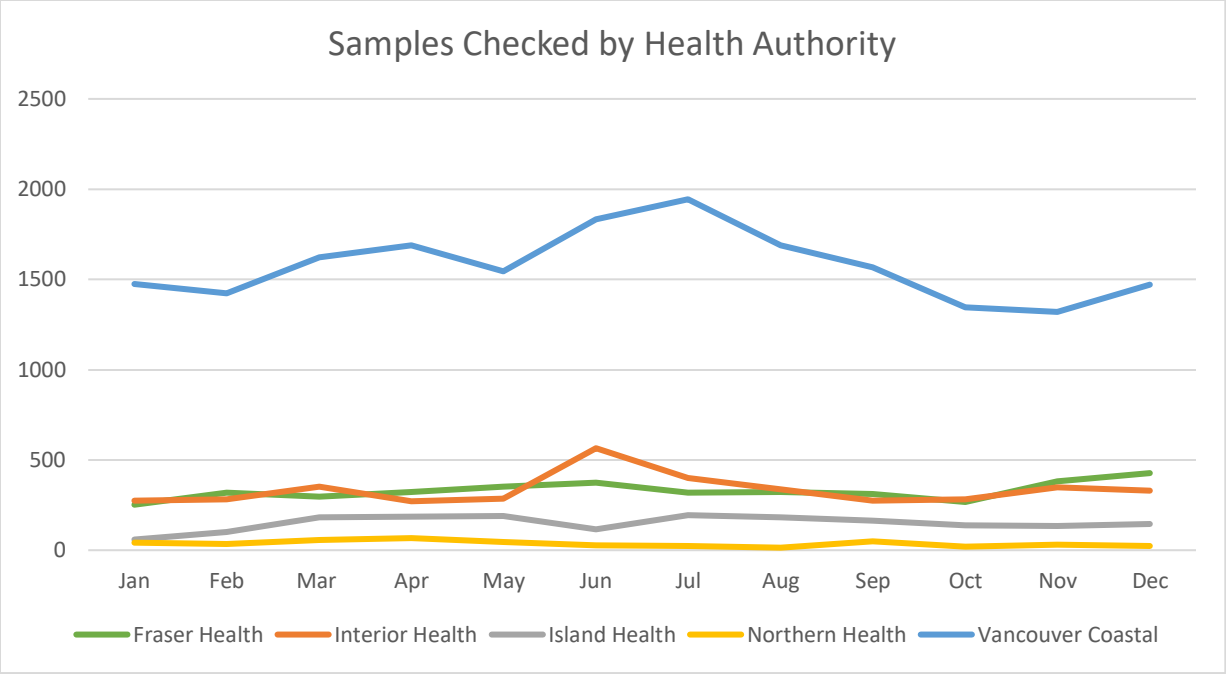

Figure 5. Total number of samples checked in each health authority per month

Access Points

Over the course of 2023, a total of 96 unique drug checking access points offered sample drop off and/or on-site testing across BC, with a peak of 48 locations accessed in the month of December 2023 (see **Figure 6**). Sites shown in the data include permanent locations in the community, as well as pop-up services offered at small music festivals such as Alitunes, Burn in the Forest, Laketown Shakedown, Sunfest, and Wicked Woods. The Interior Health region had the greatest number of access points in 2023, peaking at 23 sites in January, March, and April. In September and October, the Fraser Health region had the greatest number of access points, with 17 and 18 locations, respectively.

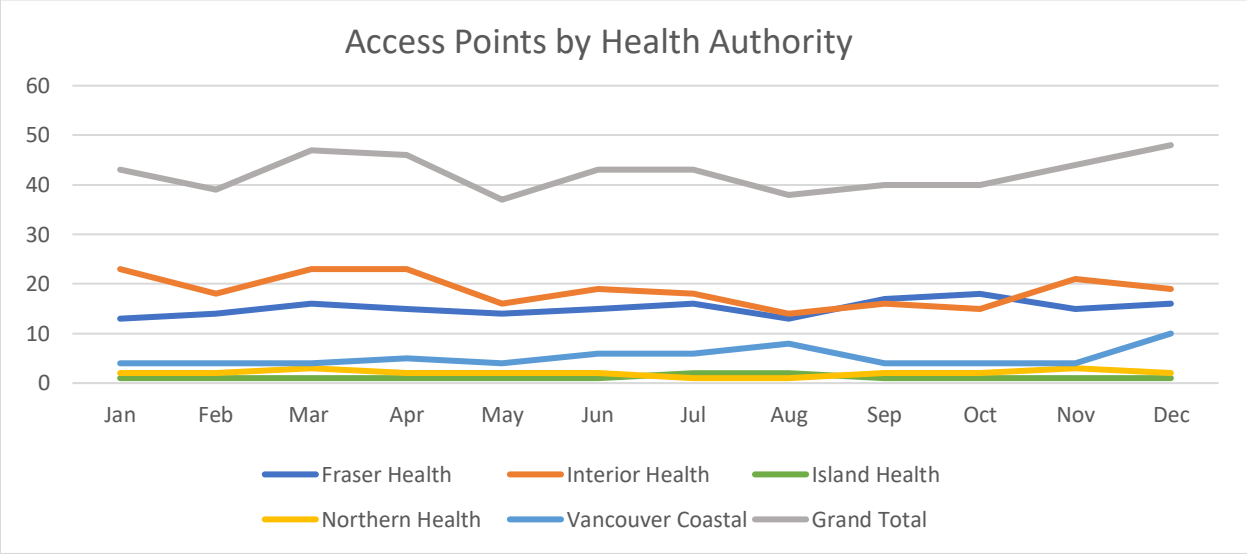

Figure 6. Total number of community drug checking access points by health authority region each month

Samples with the Expected Drug Present

When accessing drug checking services, people are asked what they expect the substance to be, which is used to determine if the expected drug was present when comparing drug checking results. Samples are considered concordant if the main expected substance is present, based on the FTIR or immunoassay strip result. Other active and unexpected compounds may be present in the sample, but are not used to determine sample concordance. In 2023, the stimulant category had the greatest percentage of samples where the expected drug was present (94.9%), while drugs in the "other" category had the least concordance, with the expected drug present in 55.8% of samples (see **Figure 7**). Polysubstance samples, referring to samples submitted for checking that contain multiple substances from different drug categories, contained the expected drugs in 75.0% of samples. A sample is labelled as an N/A result when the individual compounds are unable to be confidently identified, potentially due to the active compound being present in a low concentration in a pill/tablet or in a complicated mixture, if the compound is not available in the reference library, or if the individual refuses the use of an immunoassay strip.

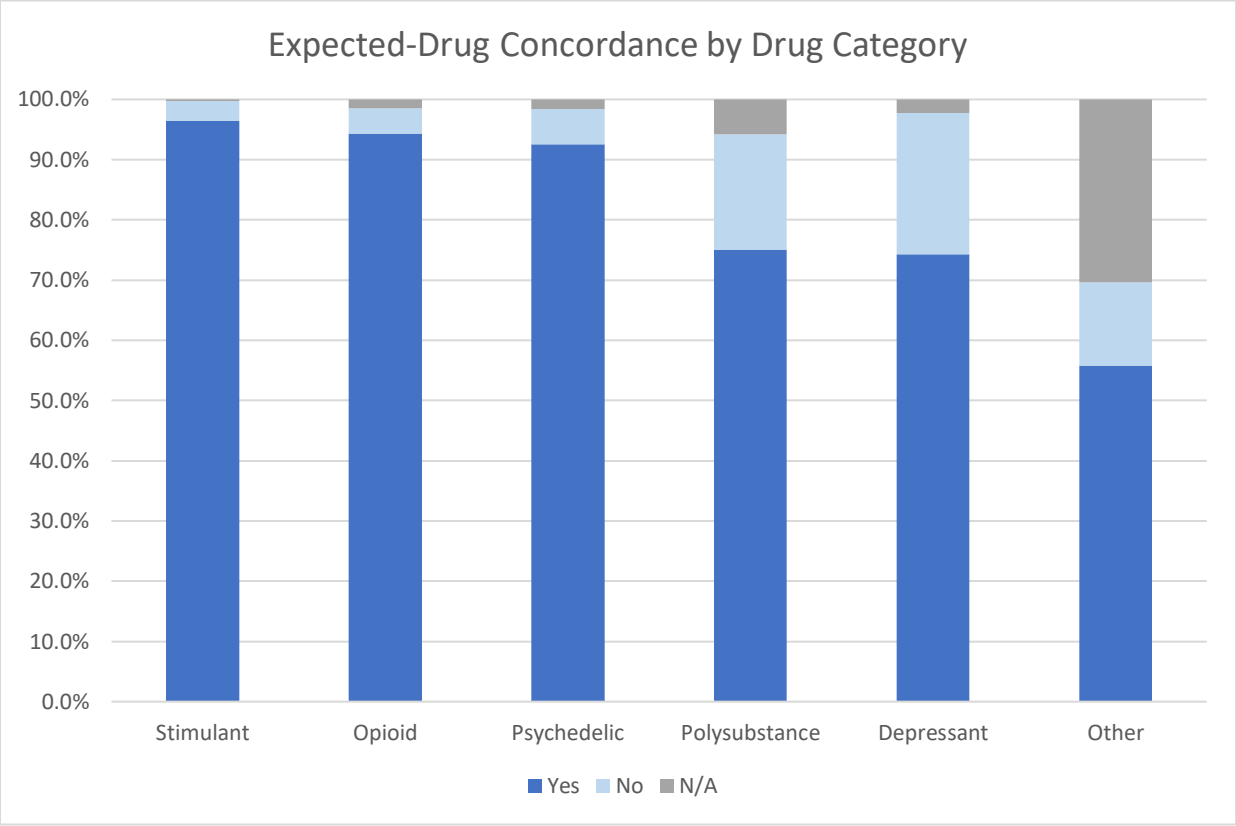

Figure 7. Stacked bar plot of drug checking result concordance by percentage in each category in 2023

Opioids

In 2023, there were a total of 11,606 samples (39.9% of all samples) checked in the opioid category. "Down", a colloquial term used to refer to a mixture of substances typically containing caffeine, a sugar (e.g., erythritol) and an opioid (generally fentanyl or heroin), was

consistently the most submitted type of opioid to drug checking each month. January had the least number of down samples submitted for drug checking (422 samples), and a peak occurred in December of 728 samples (see **Figure 8**). Fentanyl was the next most submitted opioid, with the greatest number of samples submitted in July (396 samples), and the fewest submitted in November (173 samples).New psychoactive substances (NPS), such as nitazenes, were the least common opioids submitted for drug checking every month.

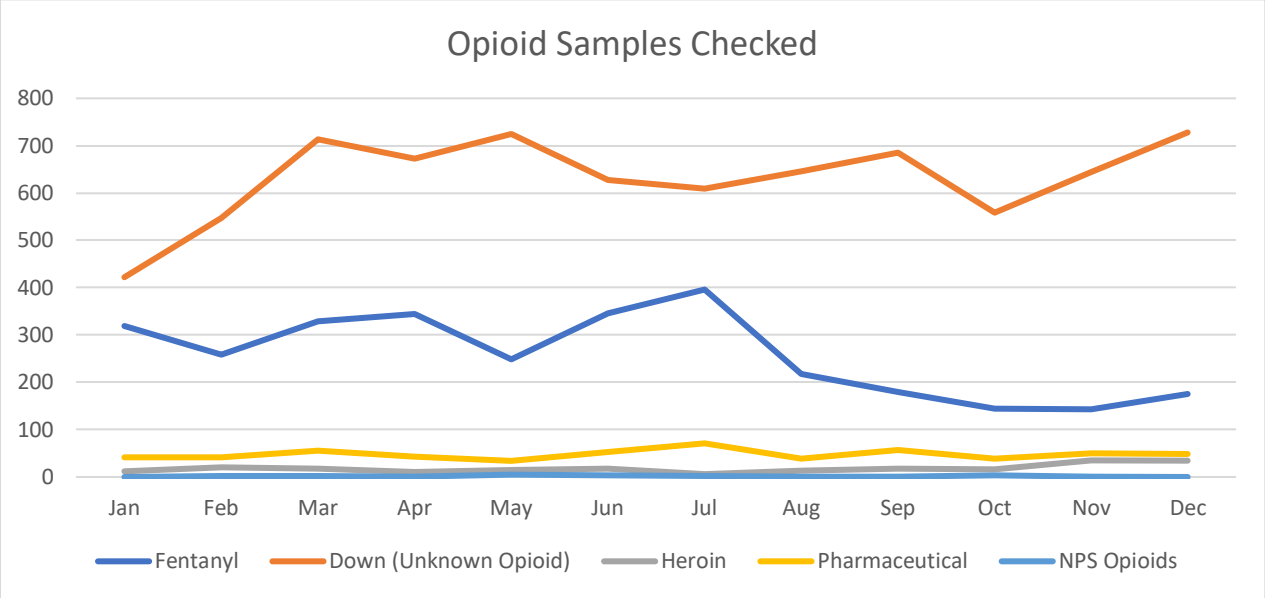

Figure 8. Line graph of the total opioid samples by type checked per month across BC in 2023

Fentanyl Concentrations

Most unregulated opioid samples checked (samples submitted as fentanyl, "down", and/or heroin), have a concentration of fentanyl between 10% and 20%. During the first half of the year, the median fentanyl concentration of unregulated opioids decreased from 16.7% in January to a low of 14.9% in June. Median fentanyl concentrations fluctuated until November and December, where it again reached 16.7% (see **Figure 9**). The highest median fentanyl concentration observed occurred in the Vancouver Coastal Health region in the month of December at 19.7%, and was highest in the region in almost every month throughout the year other than January and April (see **Figure 10**). In January, the median fentanyl concentration of unregulated opioid samples checked was highest in the Fraser Health region (18.0%). In April, median fentanyl concentration was highest in the Northern Health region (17.6%), but trends are hard to infer due to the small number of samples tested over a large region. We note that the fentanyl quantification model was trained on fentanyl HCl, but may have misidentified other analogs, such as fluorofentanyl, as fentanyl in some samples due to their spectral similarities. This is important to consider during months where fluorofentanyl increased in prevalence (see **Figure 14**).

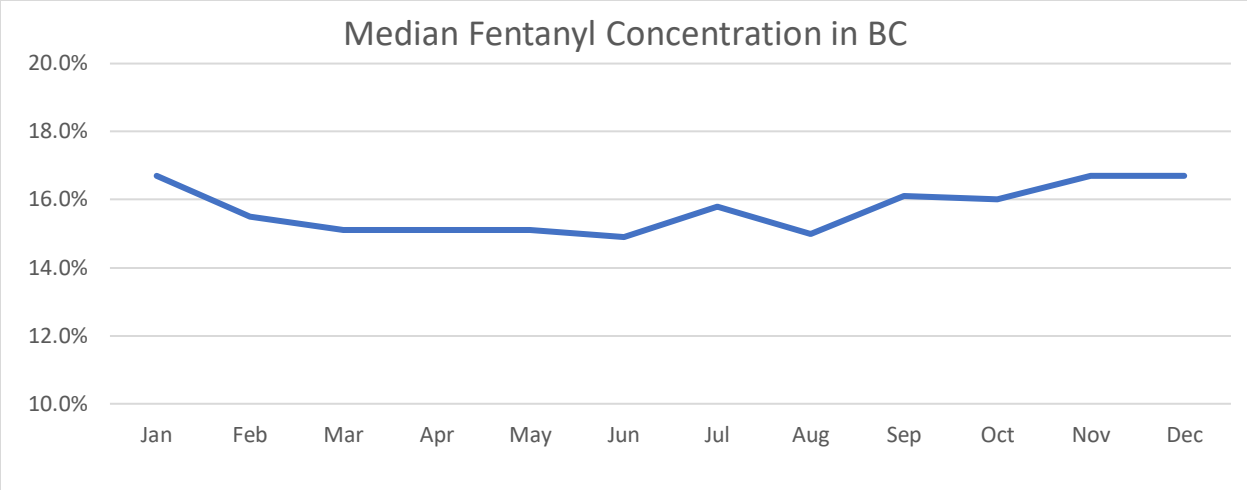

Figure 9. Line graph of median fentanyl concentrations per month in BC overall in 2023

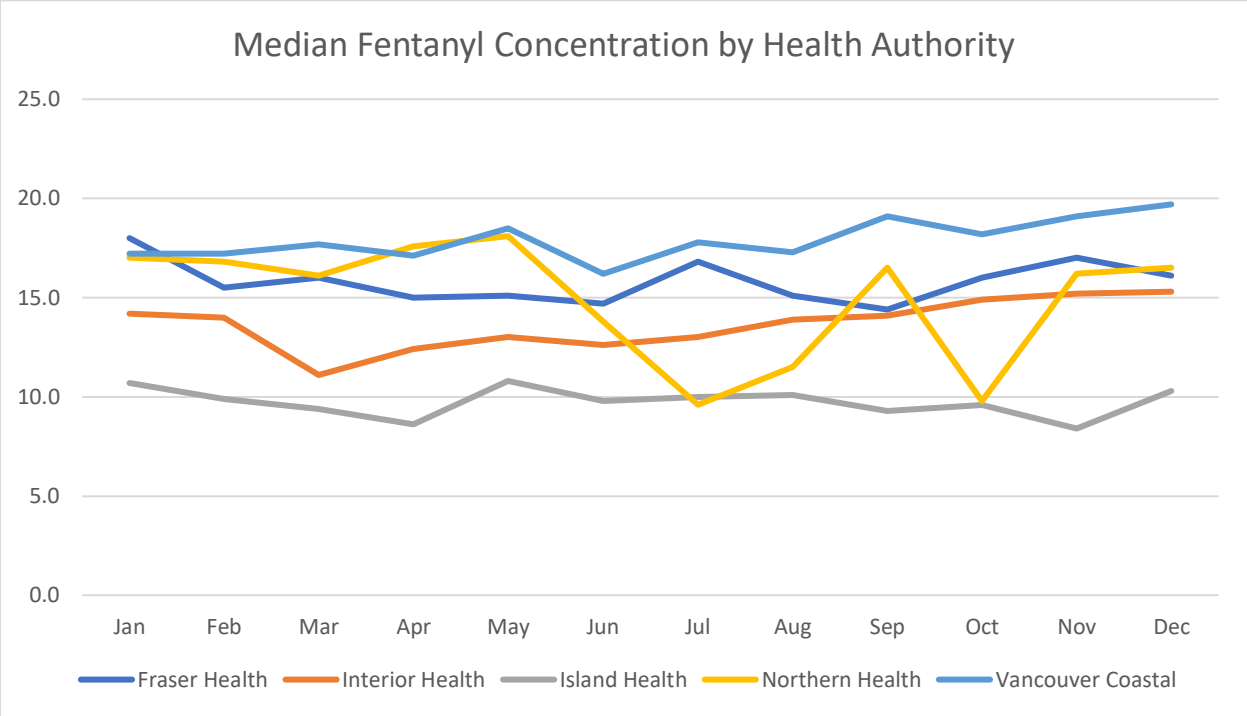

Figure 10. Line graph comparing median fentanyl concentrations by health authority across BC

Expected-Fentanyl Samples

Of the 3,100 total expected-fentanyl samples submitted for drug checking, 3,014 (97.2%) were found to contain fentanyl by either a fentanyl immunoassay strip or by the FTIR spectrometer. Other compounds in the sample were determined using the FTIR spectrometer. When looking at what other compounds were present in the concordant samples, fentanyl was identified by the FTIR spectrometer in 1,521 samples (50.5%) (see **Figure 11**). Due to the detection threshold of the FTIR spectrometer, some samples may be confirmed as fentanyl-positive with the test strip only, which is why not all 3,014 samples were identified to contain fentanyl when looking specifically at the compounds identified by the FTIR spectrometer. The two most frequently

detected buffs were caffeine in 2,163 samples (71.7%) and erythritol in 1,583 samples (52.5%). In the remaining samples (less than 1%), instances of a wide variety of other compounds were detected and are listed below **Figure 11**. While these compounds were not commonly found in most samples, the variation of different compounds is important to note, as it highlights the unpredictability and toxicity of the unregulated opioid supply.

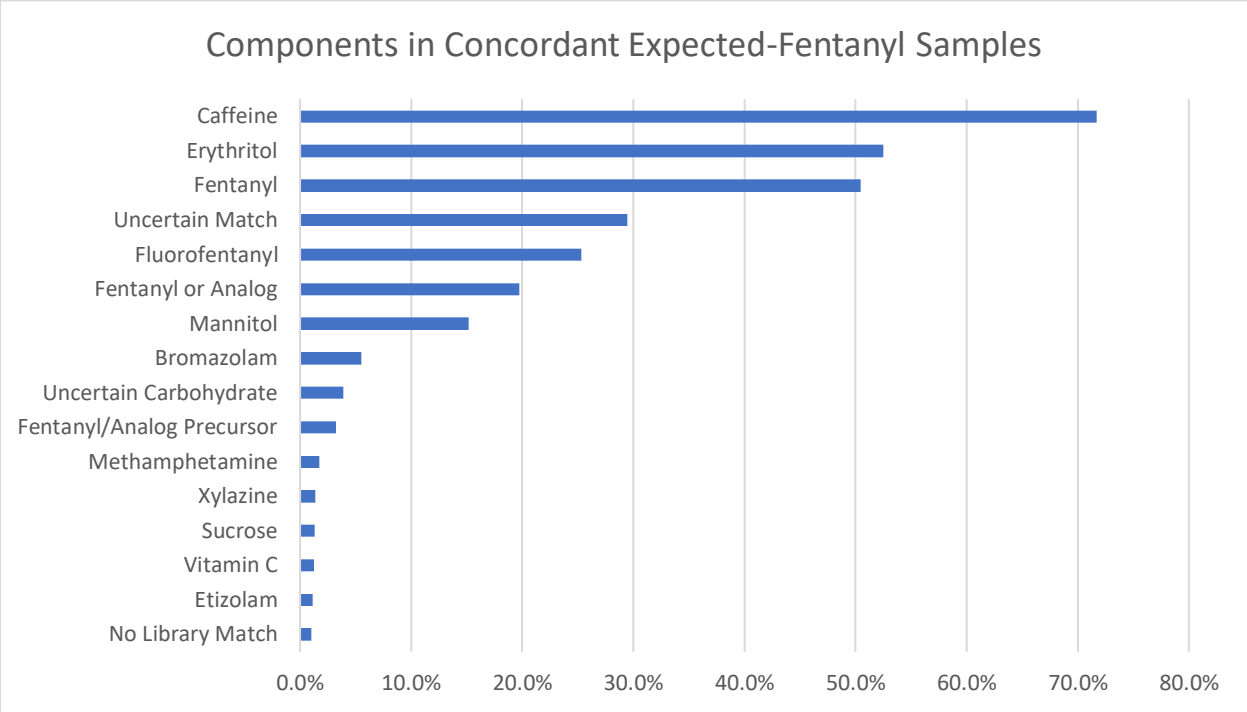

Figure 11. Bar graph of the most common substances found in expectation-concordant fentanyl samples, as confirmed by FTIR spectroscopy

**Other compounds present in <1% of expected-fentanyl samples include: benzocaine, bromazepam, caffeine citrate, clobromazolam, cocaine HCl, diclazepam, flubromazepam, fructose, glucose, inositol, ketamine, methylamine, phenylhydrazine, piperidine, plaster, polyethylene glycol, sodium bicarbonate, sodium sulfate, talc, W-19, fentanyl citrate, lorazepam, pentobarbital, propylene glycol, carfentanil, diphenhydramine, acetaminophen, alprazolam, cocaine base, flualprazolam, heroin HCl, microcrystalline cellulose, uncertain mineral, sorbitol, fentanyl base, lactose, desalkylgidazepam, dimethyl sulfone, phenacetin, and uncertain oil.*

Expected-Heroin Samples

Heroin was detected in 128 (59.5%) of the total 215 expected-heroin samples submitted for drug checking. The other two most common compounds found in concordant samples were caffeine, found in 45 samples (35.2%), and 6-MAM, found in 26 samples (20.3%) (see **Figure 12**). Fentanyl was present in six (4.7%) of the samples that also contained heroin. Additionally, two heroin-containing samples (2.9%) were found to also contain an unspecified fentanyl analog, captured here as “Fentanyl or Analog”. Samples containing heroin and fentanyl or a fentanyl analog are noted because potency is higher than what would be expected with heroin alone, increasing the risk of overdose.[6]

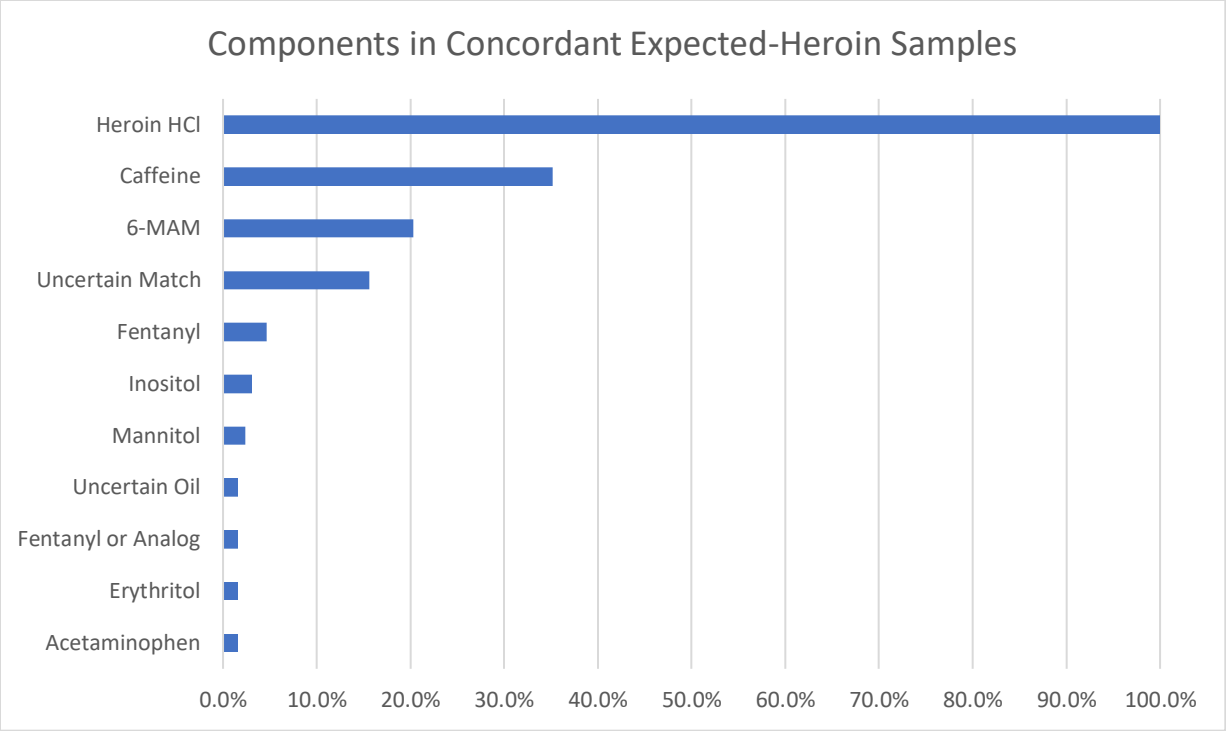

Figure 12. Bar graph of the most common substances found in expected-heroin samples in which heroin was present, as confirmed by FTIR spectroscopy*

**Other compounds present in <1% of expected-heroin samples include:* heroin base, MDMA, methamphetamine, noscapine, phenacetin, uncertain carbohydrate, vitamin C, and xylitol.

Expected-"Down" Samples

A total of 7,578 expected "down" samples were submitted for drug checking in 2023. Of these, a total of 7,400 (97.7%) samples were found to contain an opioid, either by the FTIR spectrometer or a fentanyl immunoassay test strip. It is important to note that "down" is a colloquial term for substances expected to contain an unknown opioids, typically fentanyl or heroin, so these results can be considered alongside the fentanyl and heroin samples above (**Figure 10; Figure 11**).

Of those 7,400 samples, caffeine (6,466 samples; 87.4%) and erythritol (4,896 samples; 66.2%), both buffs, were the two most common compounds (see **Figure 13**). The most detected active compound found in "down" samples by FTIR was fentanyl (3,631 samples; 49.1%). Similar to the data shown in **Figure 11**, fentanyl may not be detected by the FTIR spectrometer in all samples if present in a low concentration, but may still be determined to be fentanyl-positive by a fentanyl immunoassay strip.

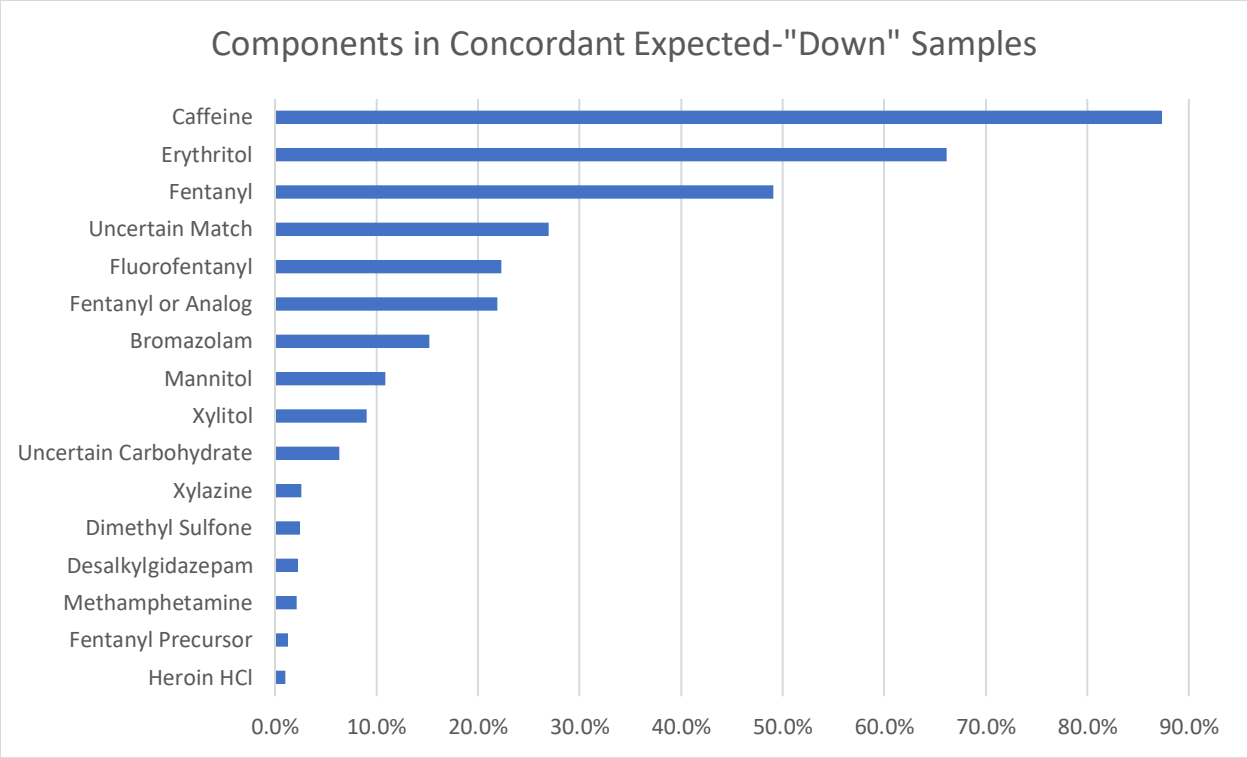

Figure 13. Bar graph of the most common substances found "down" samples where the expected drug was present, as confirmed by FTIR spectroscopy*

**Other compounds present in <1% of "down" samples include: 3-MMC, alanine, creatine, deschloroetizolam, dexamethasone acetate, ephedrine, ergotamine, fructose, ketamine base, magnesium sulfate, metamizole, N-ethylheptedrone, niacin, nitrazepam, oxazepam, piperidone, polypropylene, propylene glycol, pyrazolam, sodium silicate, sodium sulfate, talc, taurine, etodesnitazene, glutamine, protonitazene, sodium bicarbonate, sorbitol, uncertain salt, acetaminophen, benzocaine, bromazepam, carfentanil, fentanyl citrate, levamisole, nitrazolam, plaster, citric acid, diclazepam, acetoacetanilide, MDMA, caffeine citrate, cocaine HCl, alprazolam, dextrose, diphenhydramine, uncertain mineral, 6-MAM, fentanyl base, glucose, microcrystalline cellulose, vitamin C, lactose, no library match, cocaine base, flualprazolam, inositol, polyethylene glycol, phenacetin, uncertain oil, etizolam, and sucrose*

Emerging Compounds in the Unregulated Opioid Supply

Two substances became increasingly detected throughout 2023 among unregulated opioid samples (samples expected to be fentanyl, heroin, or "down"). The first, fluorofentanyl, is a synthetic fentanyl analog that is estimated to have slightly lower potency compared to fentanyl.[8] Detection of fluorofentanyl in unregulated opioid samples increased in the first half of the year and declined in the second half (see **Figure 14**). In January, 11.5% of unregulated opioids were found to contain fluorofentanyl by FTIR (87 of 755 samples), and in June, fluorofentanyl detection peaked, found in 37.5% of unregulated opioids (372 of 993 samples). In June, fentanyl and fluorofentanyl detection were almost on par, with fentanyl being detected in 40.3% of unregulated opioid samples.

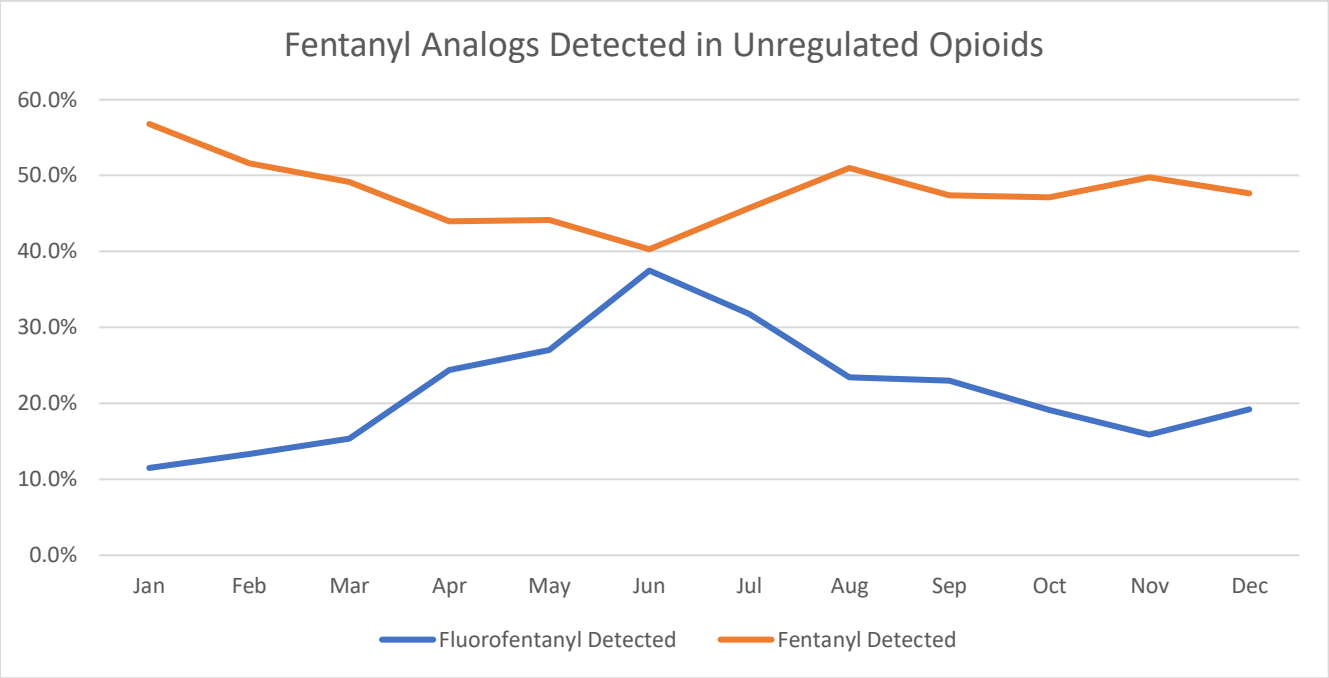

Figure 14. Line graph showing the percentage of unregulated opioids samples containing fluorofentanyl vs. fentanyl each month in 2023

We also continued to monitor the presence of xylazine, a veterinary tranquilizer, in unregulated opioid samples. In 2023, xylazine was detected in 237 (1.4%) of 10,899 unregulated opioid samples checked overall, and reached a peak of 3.3% of samples in November (27 of 822 samples) (see **Figure 15**). While the prevalence of xylazine is relatively low compared to fluorofentanyl (see **Figure 14**) and benzodiazepines (see **Figure 16**) in the unregulated opioids supply, it is a trend that will continue to be monitored throughout 2024.

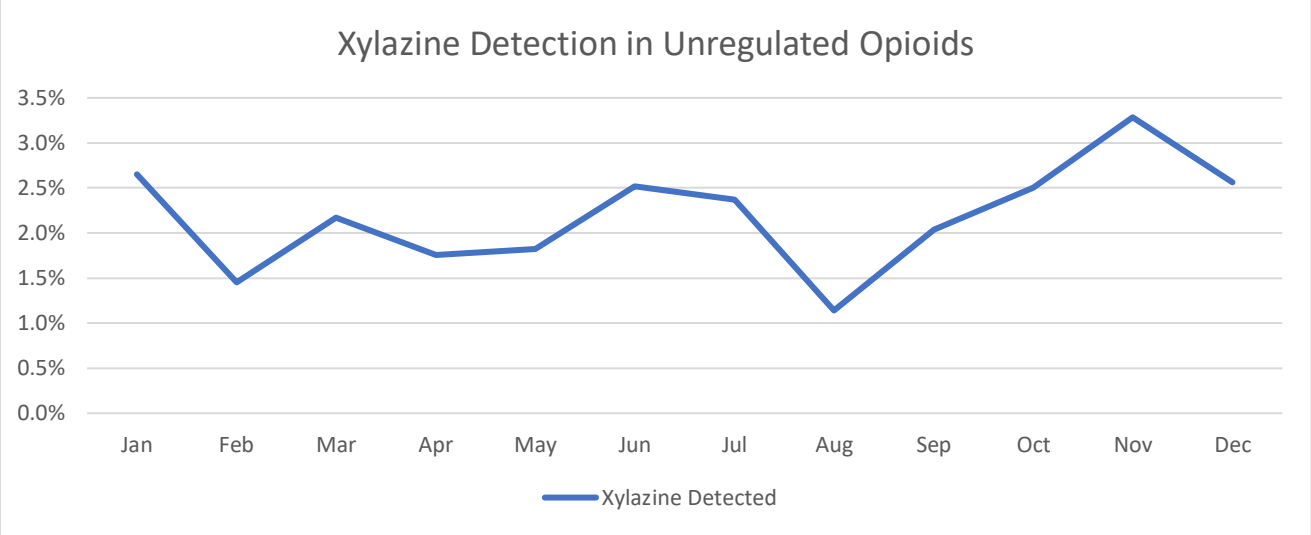

Figure 15. Line graph showing the percentage of unregulated opioids samples that contained xylazine each month in 2023

Benzodiazepine Adulteration of the Unregulated Opioid Supply

A total of 5,822 unregulated opioid samples (53.4%) were found to be as benzodiazepine-positive in 2023, as confirmed either by the FTIR spectrometer, or a positive immunoassay strip. Unregulated opioids in this section are referring to samples that were expected to contain fentanyl, heroin, fentanyl and heroin, or "down". There was an upward trend in the percent of unregulated opioid samples that tested positive for benzodiazepines throughout 2023. In January, benzodiazepine-positivity was 50.5% (381 of 755 unregulated opioid samples), and was highest in December at 58.3% (546 of 937 samples) (see **Figure 16**). We note that the true rate may be higher as etizolam, a thienotriazolodiazepine derivative that is structurally similar to benzodiazepines, is not reliably detected by benzodiazepine test strips[13].

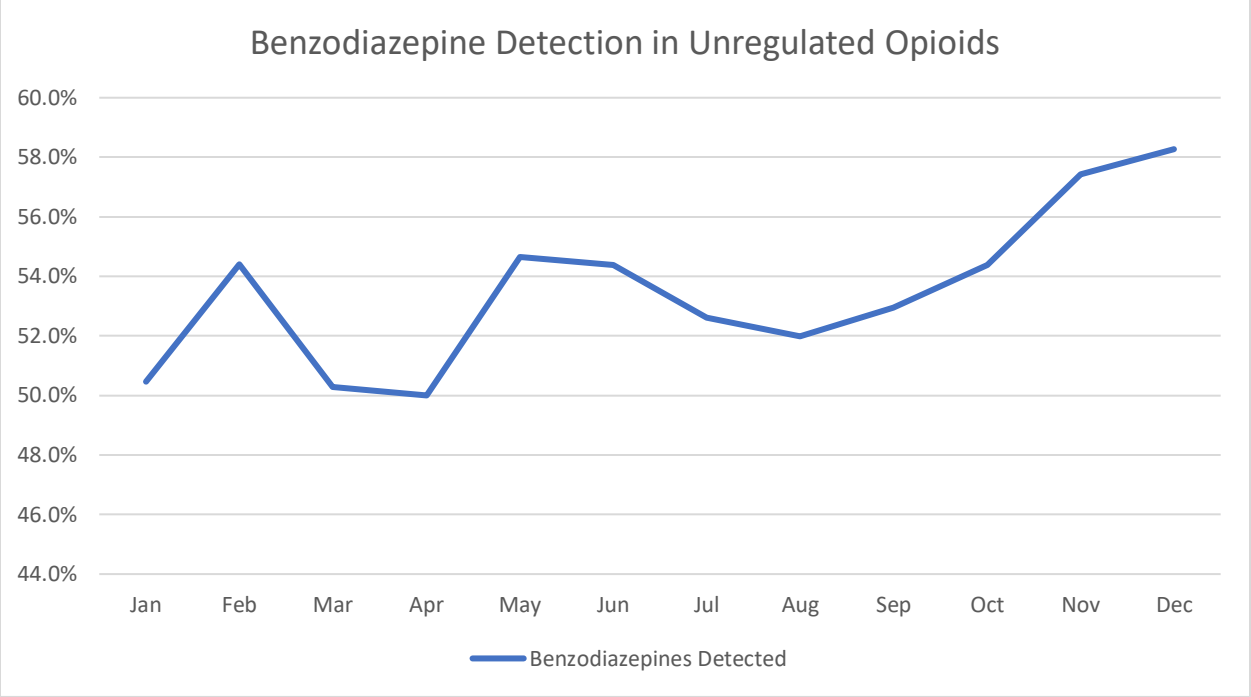

Figure 16. Percentage of unregulated opioid samples per month that contained a benzodiazepine across BC in 2023

We also examined unregulated opioid samples in which benzodiazepines were detected by FTIR rather than by test strips alone. As the FTIR cannot detect components at lower than approximately 5% concentration in a sample, this provides information about the proportion of unregulated opioid samples where benzodiazepines were found in higher concentrations, as well as about the specific types of benzodiazepines they contained. Throughout the year, the number of unregulated opioid samples that were found to contain benzodiazepines by FTIR increased. In January, 12.0% of unregulated opioids were found to contain benzodiazepines by FTIR (56 of 755 unregulated opioid samples), and was highest in November at 18.5% indicating their presence in higher concentrations (see **Figure 17**).

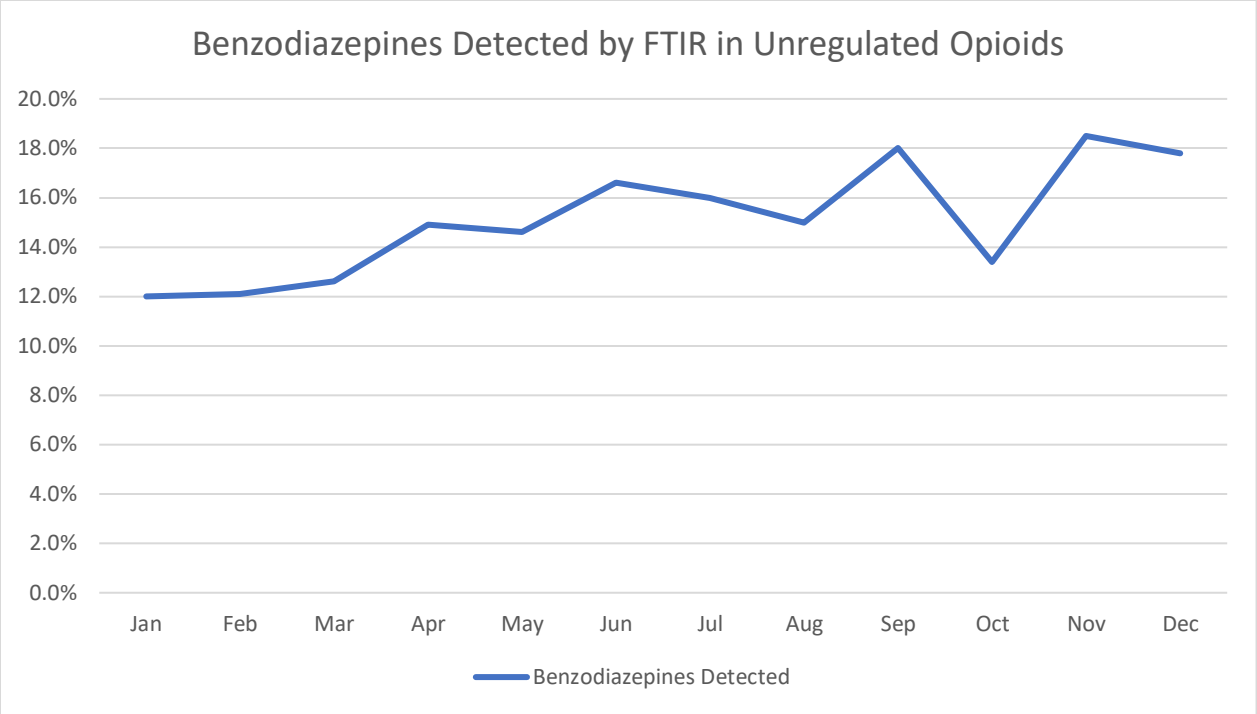

Figure 17. Percentage of unregulated opioid samples per month that were found to contain a benzodiazepine by FTIR across BC in 2023

Looking specifically at the types of benzodiazepines detected, bromazolam was the most frequently found, with a total of 688 samples (6.3% of all unregulated opioids) in 2023 (see **Figure 18**). Bromazolam detection was lowest in February (39 samples), and highest in June (79 samples). The next most frequently detected benzodiazepines included desalkylgidazepam, found in a total of 97 samples (0.9% of unregulated opioids), and etizolam, found in a total of 61 samples (0.6% of unregulated opioids). It is of note that the data shown in **Figure 18** are of benzodiazepine-positive unregulated opioid samples confirmed by the FTIR spectrometer only, as benzodiazepine strips cannot detect the specific type of benzodiazepine, and may not be fully representative of the benzodiazepines present in the unregulated opioid supply due to the detection threshold of the spectrometer.

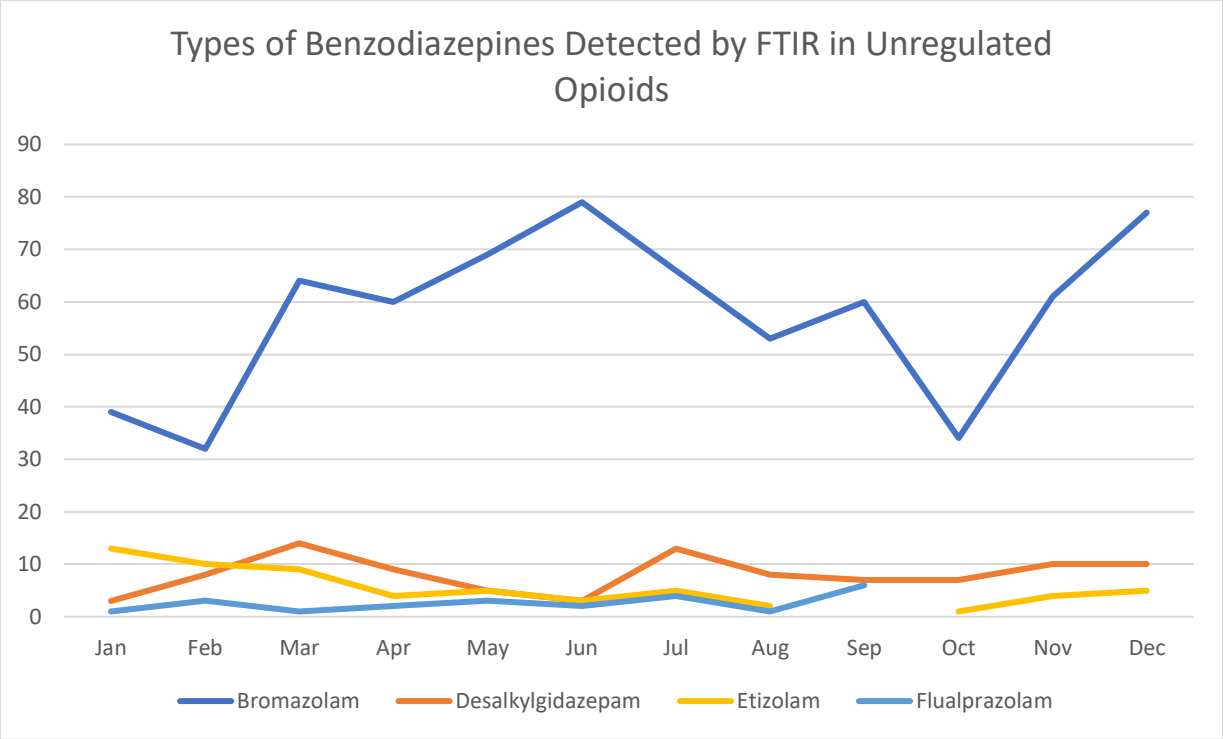

Figure 18. Frequency of the most common benzodiazepines detected by the FTIR spectrometer in unregulated opioid samples by month in 2023*

**Benzodiazepines detected in <5 total unregulated opioid samples in 2023 include: diclazepam, bromazepam, clobromazolam, deschloroetizolam, flubromazepam, lorazepam, nitrazepam, nitrazolam, and pyrazolam.*

Expected-Pharmaceutical Opioids

A total of 575 samples checked in the opioid category were expected to be pharmaceutical opioids (**Figure 8**). The most frequently checked pharmaceutical opioids were expected-hydromorphone (Dilaudid), oxycodone, and acetaminophen + oxycodone (Percocet) samples. When the expected opioid is present, authentic pharmaceutical opioid pills are difficult to distinguish from "good fakes", but some counterfeit pills will contain an unexpected active ingredient instead of the expected drug. The following analysis examines expected-pharmaceutical opioids that were non-concordant, meaning they contained an active ingredient other than the expected drug, as determined by FTIR or fentanyl and/or benzodiazepine immunoassay test strip.

Expected-Hydromorphone

Out of the 225 samples submitted as hydromorphone, 6.2% (14 samples) did not contain the expected drug and instead contained an unexpected active ingredient, the most common being fentanyl which was detected by test strip (35.7%; 5 samples) (**Figure 19**).

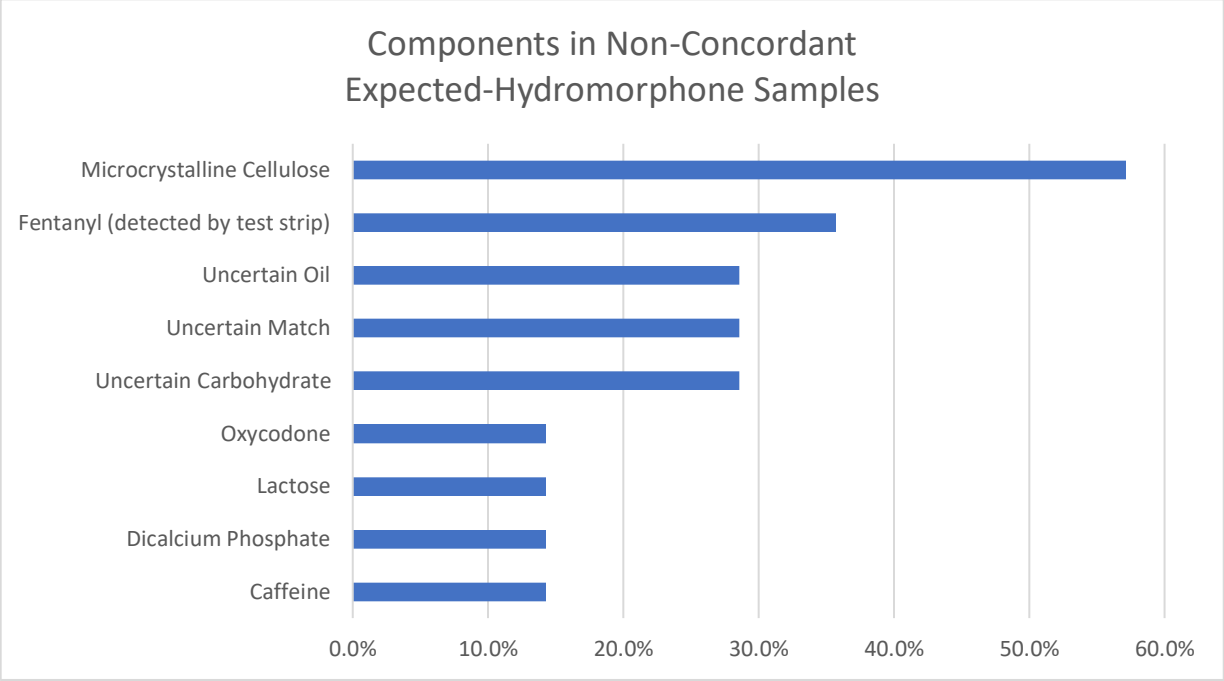

Figure 19. Bar graph of the most common substances found in expected-hydromorphone samples where the expected drug was **not** present and contained an unexpected active ingredient*

**Other compounds present in <2 expected-hydromorphone samples include: benzocaine, calcium stearate, cyclobenzaprine, hydrochlorothiazide, no library match, protonitazene, and benzodiazepines (detected by test strip).*

Expected-Oxycodone

Out of the 168 samples submitted as oxycodone, 35.1% (59 samples) did not contain the expected drug and instead contained an unexpected active ingredient, the most common being fentanyl which was detected by test strip (62.7%; 37 samples), and 10.2% (6 samples) contained benzodiazepines as detected by test strip (**Figure 20**).

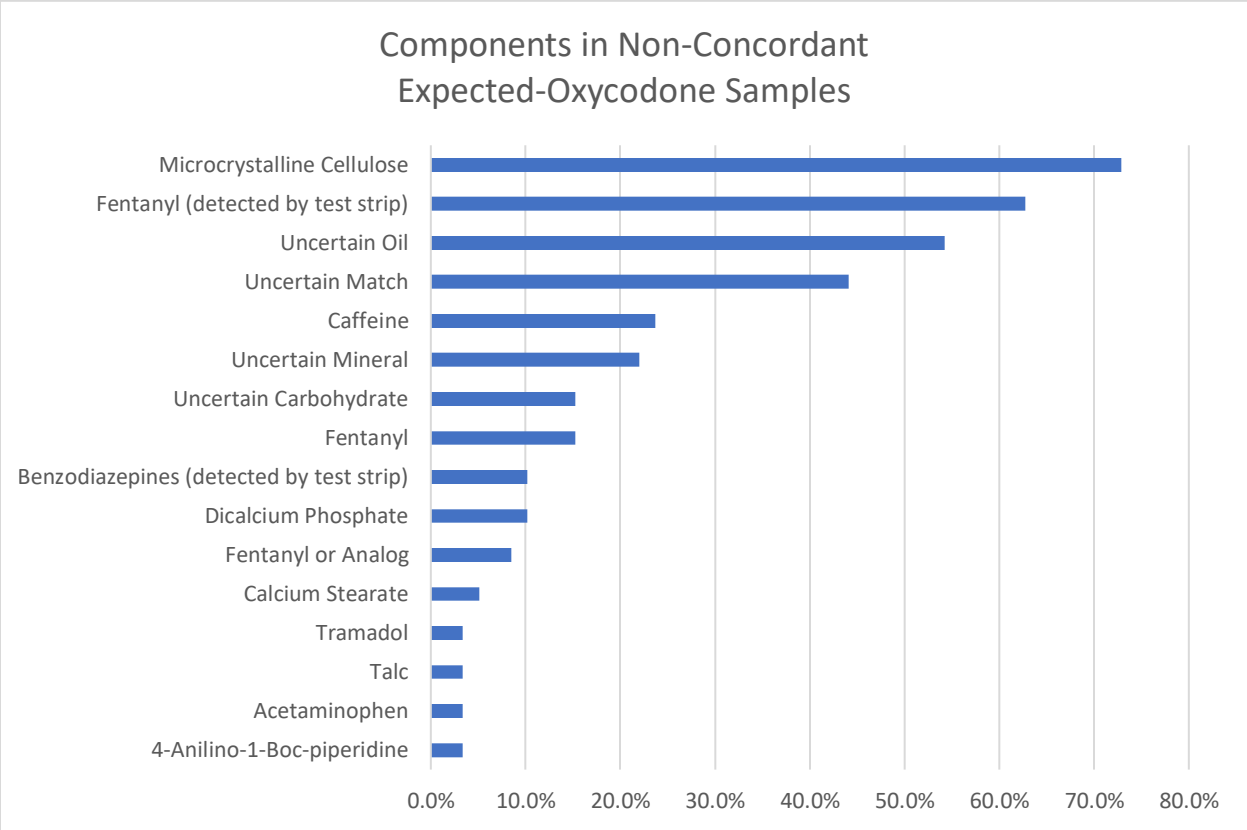

Figure 20. Bar graph of the most common substances found in expected-oxycodone samples where the expected drug was **not** present and contained an unexpected active ingredient*

**Other compounds present in <2 expected-oxycodone samples include: AMB-FUBINACA, heroin HCl, hydromorphone, metonitazene, N,N-dimethylpentylone, oxandrolone, para-fluorofentanyl, sucrose, and xylazine.*

Expected-Acetaminophen + Oxycodone

Out of the 117 samples submitted as acetaminophen + oxycodone, 43.5% (51 samples) did not contain either expected drug and instead contained an unexpected active ingredient. The most common unexpected active ingredients detected were fentanyl/fentanyl analogs (51.0%). In two samples (3.9%), benzodiazepines were detected by test strip (**Figure 21**).

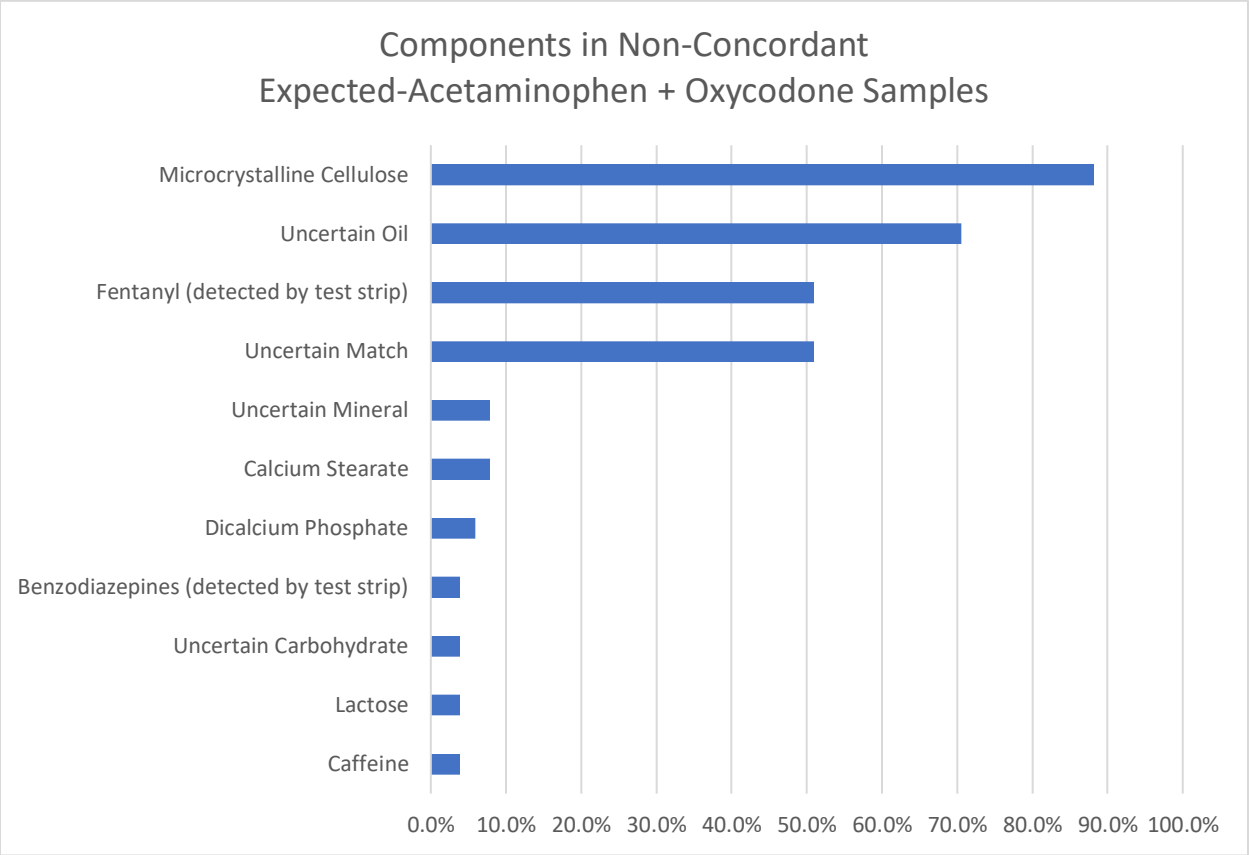

Figure 21. Bar graph of the most common substances found in expected-oxycodone samples where the expected drug was **not** present and contained an unexpected active ingredient*

**Other compounds present in <2 expected-acetaminophen + oxycodone samples include: acetaminophen, erythritol, famotidine, fentanyl or analog, glucose, hydromorphone, polyethylene glycol, sildenafil, sucrose, and tramadol.*

Fentanyl Positivity in Non-Opioid Substances

Table 1 examines the prevalence of fentanyl adulteration in non-opioid substances, based on the percentage of samples in each category that were confirmed to contain fentanyl with a positive immunoassay strip, detection with the FTIR spectrometer, or both.

Of the substances checked in the stimulant category, 104 (5.4%) of the 1,936 expected-methamphetamine samples tested positive for fentanyl. We note that methamphetamine is known to cause false-positive results on fentanyl test strips if tested in higher concentrations, which could explain some of these instances. The two other stimulants with the highest proportion of fentanyl-positive samples were expected-crack cocaine samples (45 samples; 5.0%), and expected-cocaine (24 samples; 0.8%).

Of the substances checked in the depressants category, expected-xylazine had the lowest frequency of samples tested (15 samples), but the highest proportion of fentanyl-positive samples (5 samples; 33.3%). The two other depressants with the highest proportion of fentanyl-

positive samples were expected-benzodiazepine (unknown)* samples (31 samples; 24.4%) and bromazolam (9 samples; 20.5%).

Within the psychedelic category, 0.5% (1 sample) of expected-MDA samples were fentanyl-positive, and an alert was subsequently issued. Of the expected-MDMA samples, 0.4% (10 samples) were fentanyl-positive. Similar to methamphetamine, MDMA can also cause false-positive results on the fentanyl test strip, which may have contributed to some of the fentanyl-positive results observed here. Expected-DMT had the lowest frequency of samples tested (73 samples), but the highest proportion of fentanyl-positive samples (1 sample; 1.4%). This particular expected-DMT sample did not contain DMT, and instead was found to contain a synthetic cannabinoid, caffeine, and fentanyl detected by test strip, and an alert was issued.

We note that many samples were suspected to be cross-contaminated at the service-user end prior to testing, especially in the stimulant and depressant categories, which likely inflated the proportion of fentanyl-positive samples reported here. Drug checking technicians will log in the comments section of the database when cross-contamination is suspected, which often occurred when the service user had either tested or stored the non-opioid sample with a "down" or fentanyl sample. Additionally, the proportion of fentanyl-positive samples can be inflated with fewer samples being checked of a particular substance.

Fentanyl-Positive Non-Opioid Samples			
Category	**Expected-Substance**	**Proportion Fentanyl-Positive (%)**	**Total number of submitted samples**
Stimulants	Cocaine	0.8	2,972
	Crack Cocaine	5.0	895
	Methamphetamine	5.4	1,936
Depressants	Alprazolam	2.0	458
	Benzodiazepine (Unknown)*	24.4	127
	Bromazolam	20.5	44
	Diazepam	5.6	36
	Xylazine	33.3	15
Psychedelics	MDMA	0.4	2,809
	Ketamine	0.1	1,695
	DMT	1.4	73
	MDA	0.5	194

Table 1. Table showing percentage of fentanyl-positive samples for select substances in each non-opioid drug category based on FTIR spectrometry and immunoassay strips

**Note that Benzodiazepine (Unknown) was added into the database February 2023, and denotes cases where the service user expected a benzodiazepine but was unsure regarding the specific type.*

Depressants

A total of 1272 samples (4.4% of all samples) were checked in the depressant category in 2023. Of the depressant samples, expected-benzodiazepines were the most commonly checked depressants throughout the year, with the greatest number of samples checked in November (75 samples) (see **Figure 22**). GHB was the second most checked depressant, with the greatest number of samples being checked in September (60 samples). We note that very few expected-zopiclone and xylazine samples were submitted throughout the year (<20 samples each), and overlapped in frequency almost every month except from June to August, where no zopiclone was checked (see **Figure 22).**

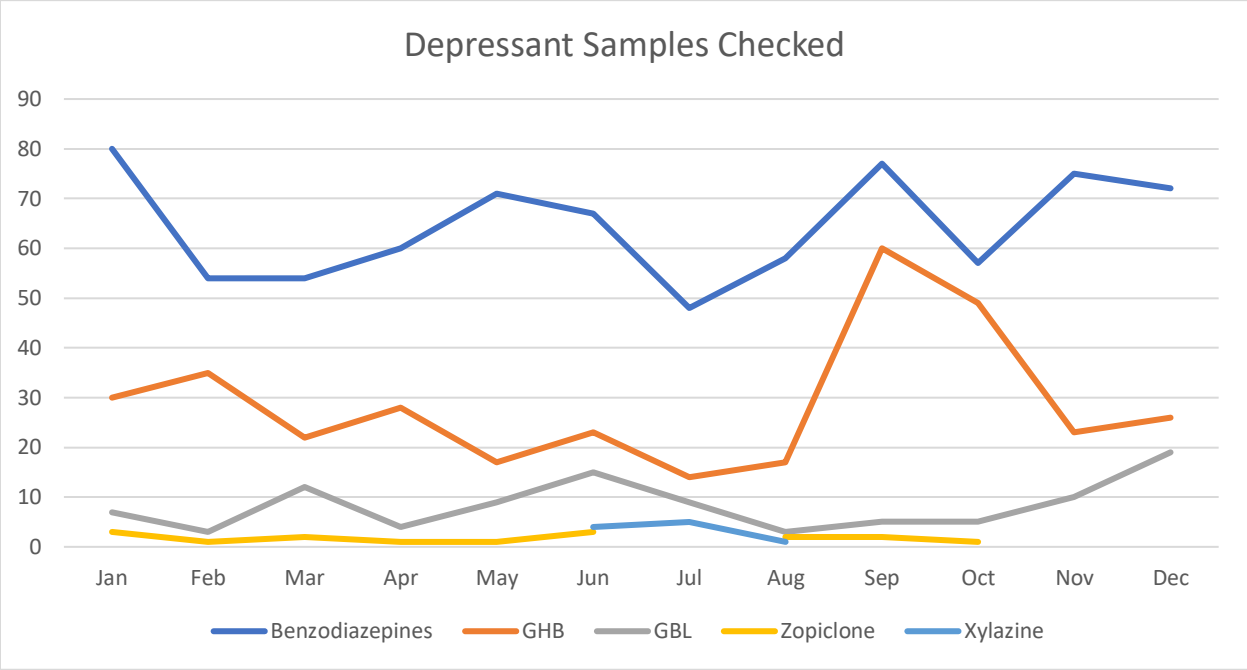

Figure 22. Samples in the depressant category checked per month in 2023 across BC*

**Other samples checked in the depressant category that total <1% of samples include: gabapentin, 1,4-butanediol, rilmazafone, phenibut, zolpidem, W-18, methylmethaqualone, methaqualone, gaboxadol, bretazenil, and baclofen.*

Expected-Benzodiazepines

Of the 1272 depressant samples checked in 2023, 773 were expected-benzodiazepines. Alprazolam was the most commonly submitted benzodiazepine throughout the year, and was most frequently submitted for drug checking in January. "Benzodiazepine (Unknown)" was added as an expected drug option to our database in February 2023, which denotes cases where the service user expected a benzodiazepine but was unsure regarding the specific type. This may have contributed to the decrease in expected-alprazolam samples submitted throughout the rest of the year, as it is becoming well-known that pills that are made to look like alprazolam (Xanax) pills, often do not contain alprazolam, and could contain another benzodiazepine. Expected-benzodiazepine (unknown) samples were the next most common benzodiazepine submitted for drug checking, and contributed to 10% of overall benzodiazepine samples checked (see **Figure 23**).

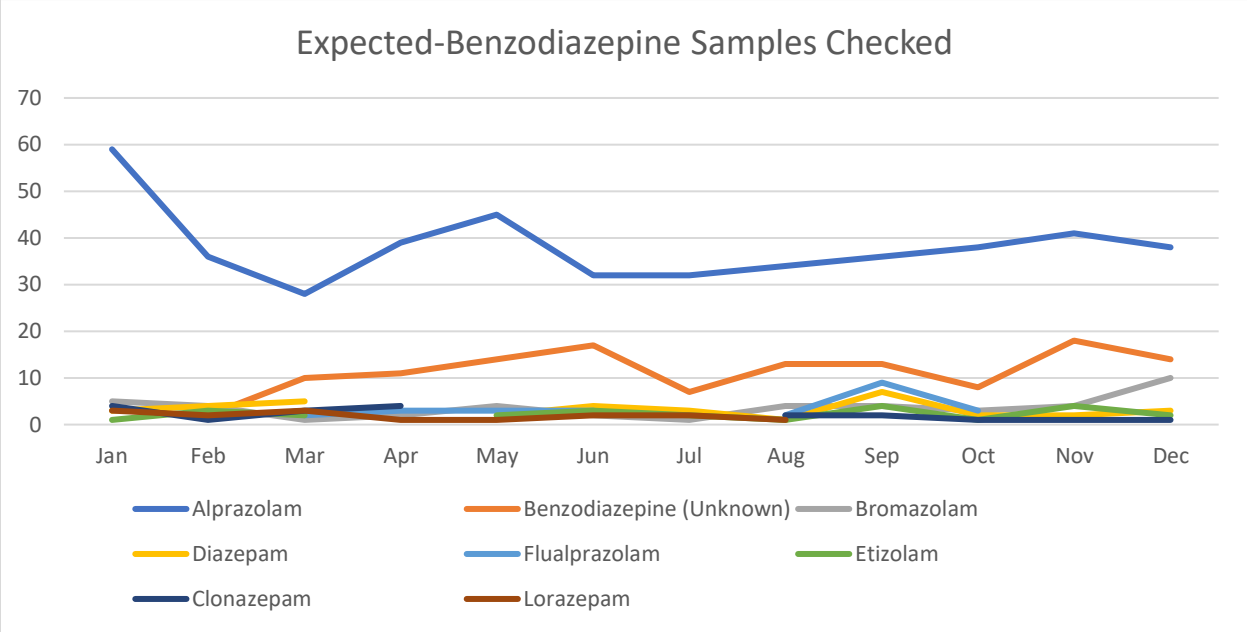

Figure 23. Expected-benzodiazepine samples in the depressant category checked per month in 2023 across BC

Of the 1272 depressant samples checked, 458 (36.0%) were expected to be alprazolam. A total of 301 were found to contain a benzodiazepine by immunoassay strip, the FTIR spectrometer or a combination of both. The three most common compounds determined to be in the concordant-alprazolam samples by the FTIR spectrometer were: microcrystalline cellulose (234 samples; 77.7%), uncertain oil (166 samples; 55.1%), and uncertain match (138 samples; 45.8%) (see **Figure 24**). An uncertain match or uncertain oil reading can be due to a spectrum signal being present that is not distinct enough to be detected as a unique substance, causing the technician to be unable to confirm a specific compound. Uncertain oil is typically associated with the binding agent included during the pill pressing process. An alternative reason could be that there was signal noise present, but no additional compound.

Expected-Alprazolam

Alprazolam was confirmed by the FTIR spectrometer to be in 21 samples (7.0%). The low prevalence of alprazolam within the components detected by the FTIR could be due to a sample being confirmed as benzodiazepine-positive by an immunoassay strip, but alprazolam being present in too low of a concentration to be detected by the FTIR spectrometer. Note that samples that tested positive for benzodiazepines by test strip were considered concordant unless a different benzodiazepine was detected by FTIR. Additionally, immunoassay strips can only detect the presence of benzodiazepines in general, meaning that alternative benzodiazepines may have been present aside from alprazolam.

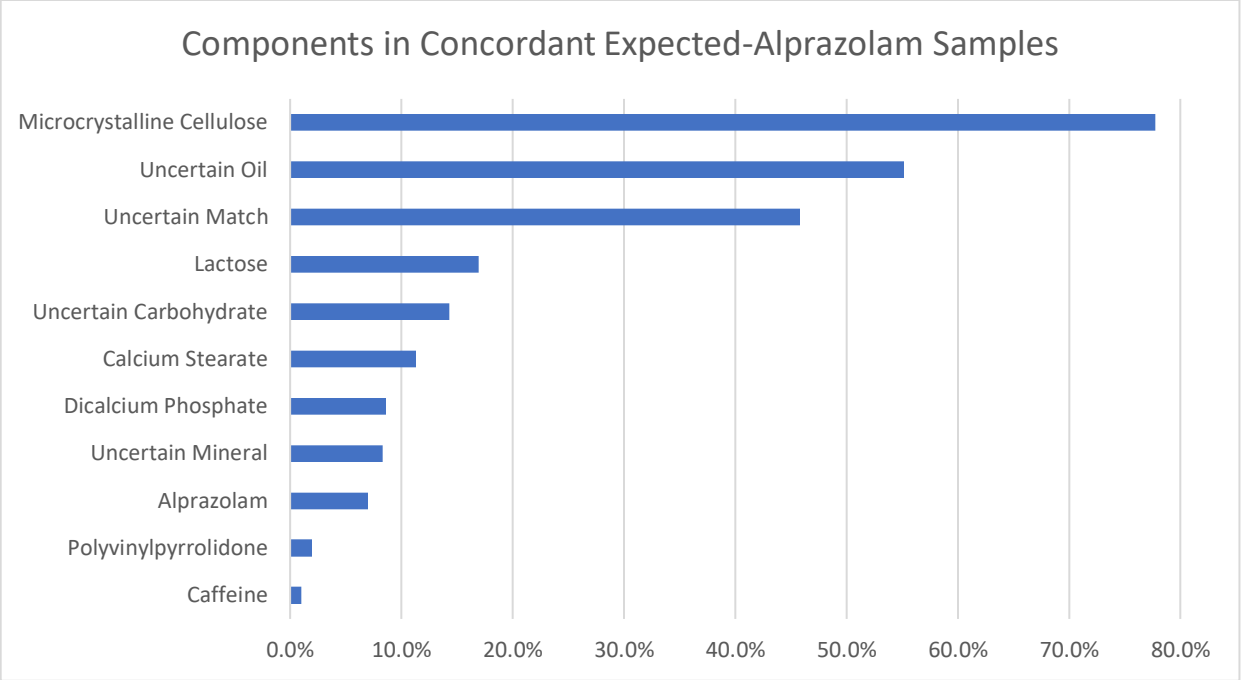

Figure 24. Bar graph of the most common substances found in expected-alprazolam samples in which alprazolam was detected by FTIR spectroscopy, and/or a positive benzodiazepine immunoassay strip*

**Other compounds present in <1% of expected-alprazolam samples include bromazolam, citalopram, cocaine HCl, diclazepam, erythritol, etizolam, fentanyl or analog, flualprazolam, glucose, heroin base, mannitol, soap, sucrose, talc, trazodone, and xylazine.*

Stimulants

A total of 6,025 stimulant samples were checked in 2023, with cocaine consistently being the most frequently checked throughout the year (2,972 samples; 49.3%) (see **Figure 25**). June had the most cocaine samples checked (341 samples) and January had the fewest (166 samples). Methamphetamine was the second most checked stimulant throughout the year, with the most samples being checked in January and June (180 samples) and the least number of samples checked in November (140 samples). Crack cocaine had the most samples being checked in November (91 samples) and the least in February (47 samples). There were a total of 83 samples expected to be 3-MMC, a synthetic stimulant of the cathinone class, submitted for drug checking, and fewer than 10 expected-amphetamine samples each month, with a total of 65 submitted throughout the year.

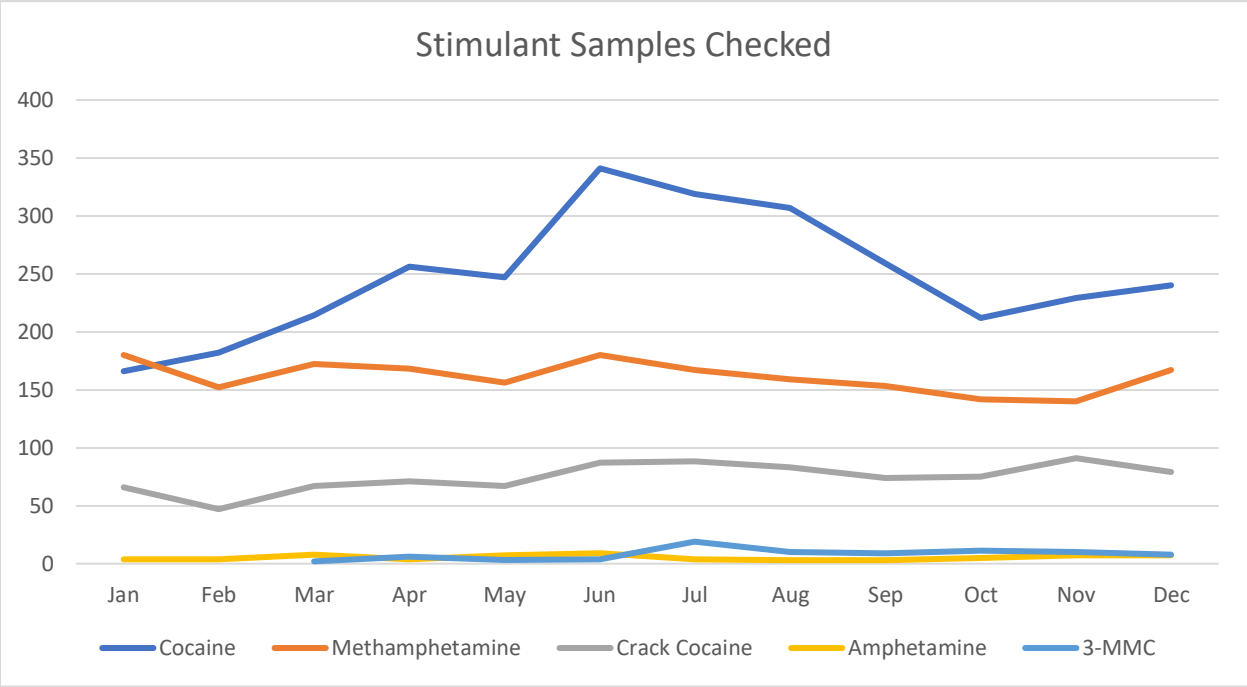

Figure 25. Total number of stimulant samples checked each month in 2023 across BC*

**Other samples checked in the stimulant category that total <1% of all stimulant samples include: 4-MMC, methylphenidate, lisdexamfetamine, pseudoephedrine, speed (uncertain methamphetamine or amphetamine), phenmetrazine, n-ethylpentedrone, MDPM, ephedrine, dimethyl cathinone, 5-DBFPV, 4F-MPH, 4-FMA, 2-FA.*

Expected-Cocaine

There was a total of 2,972 expected-cocaine samples submitted to drug checking 2023 and of those, 2,915 (98.1%) were confirmed to contain cocaine by the FTIR spectrometer (see **Figure 26**). Of these, 157 samples (5.4%) also contained an uncertain match. An "uncertain match" denotes when another compound(s) is suspected in a sample upon FTIR analysis, such as a cutting agent, but a sufficient match cannot be determined. The two most commonly detected buffing and cutting compounds were inositol (81 samples; 2.8%) and phenacetin (64 samples; 2.2%), respectively.

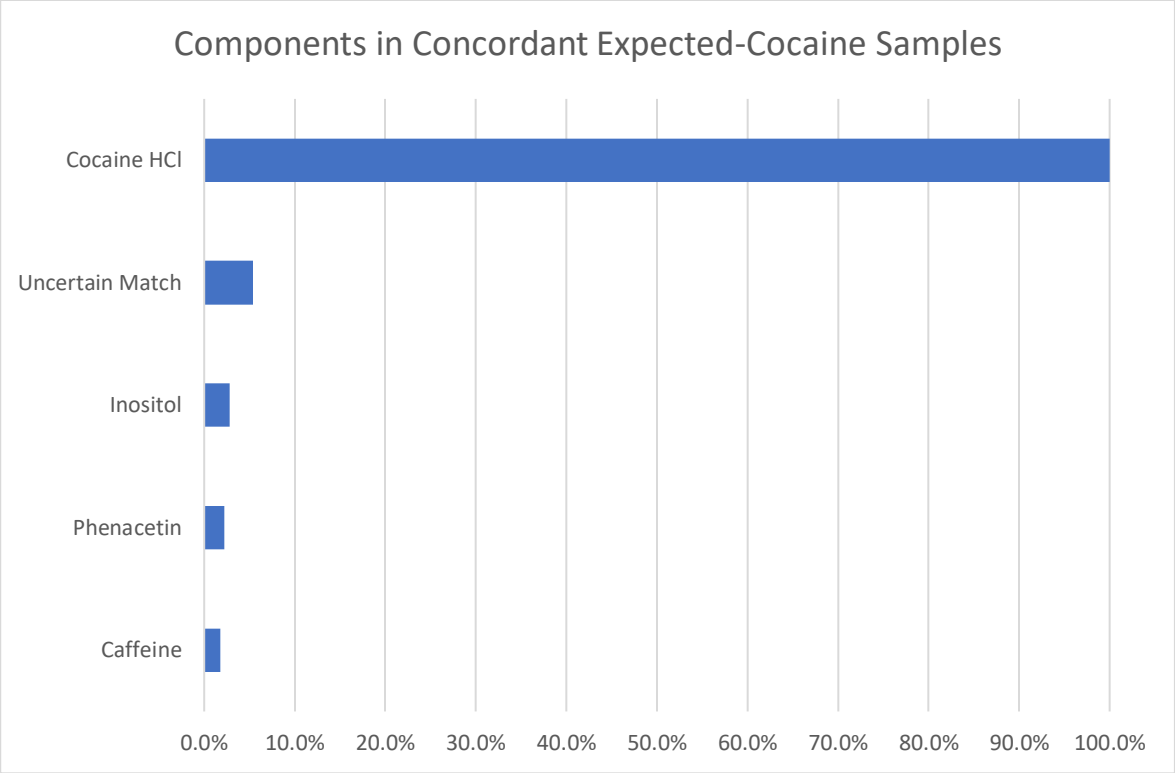

Figure 26. Bar graph of the most common substances found in expected cocaine samples in which cocaine was present, as confirmed by FTIR spectroscopy*

**Other compounds present in <1% of expected-cocaine samples include: levamisole, uncertain carbohydrate, benzocaine, uncertain oil, methamphetamine, talc, mannitol, ketamine, cocaine base, creatine, glutamine, lactose, sodium bicarbonate, acetaminophen, procaine, MDMA, glucose, dimethyl sulfone, oleamide, boric acid, tiletamine, thiamine, THC, sucrose, magnesium carbonate, lidocaine, fentanyl or analog, erythritol, deschloroketamine, benzyl alcohol and 3-MMC.*

Expected-Crack Cocaine

A total of 861 of the 895 (96.2%) crack cocaine samples submitted for drug checking contained cocaine base, as determined by the FTIR spectrometer (see **Figure 27**). Of the 861 samples that tested positive for crack cocaine, the second most frequently detected compound by the FTIR spectrometer was phenacetin, a cocaine cut, in 178 samples (20.7%). A total of 48 samples (5.6%) contained an uncertain match.

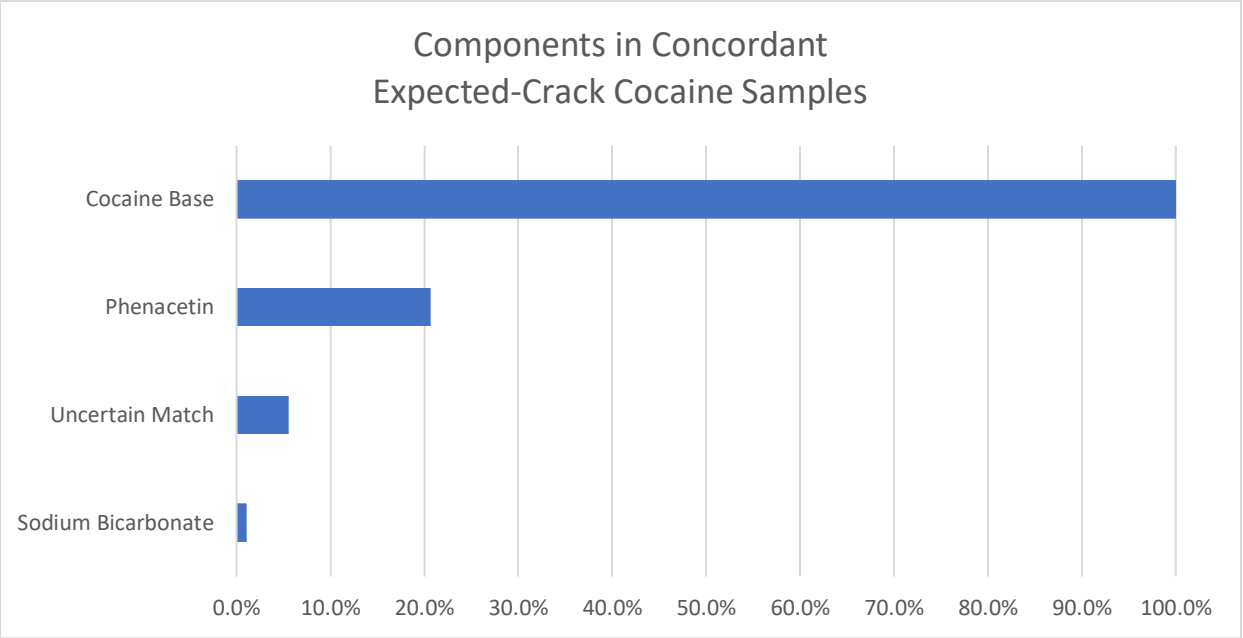

Figure 27. Bar graph of the most common substances found in expected crack cocaine samples in which crack cocaine was present, as confirmed by FTIR spectroscopy*

**Other compounds present in <1% of expected-crack cocaine samples include: caffeine, cocaine HCl, uncertain mineral, ketamine base, inositol, levamisole, uncertain carbohydrate, talc, methamphetamine, GHB (wet), fentanyl or analog, benzocaine, acetaminophen, uncertain oil, sodium carbonate, soap, HXE and fentanyl HCl.*

Expected-Methamphetamine

Of the total 1,936 expected-methamphetamine samples submitted for drug checking in 2023, 1,886 samples (97.4%) were determined to contain methamphetamine (see **Figure 28**). Of these, dimethyl sulfone was the second most frequently detected compound in the concordant-methamphetamine samples (136 samples; 7.2%). Dimethyl sulfone is an inactive health supplement often used as a cutting agent in methamphetamine as it has a similar appearance in colour and crystalline form. Of the samples that contained methamphetamine, 93 samples (4.9%) also contained an uncertain match.

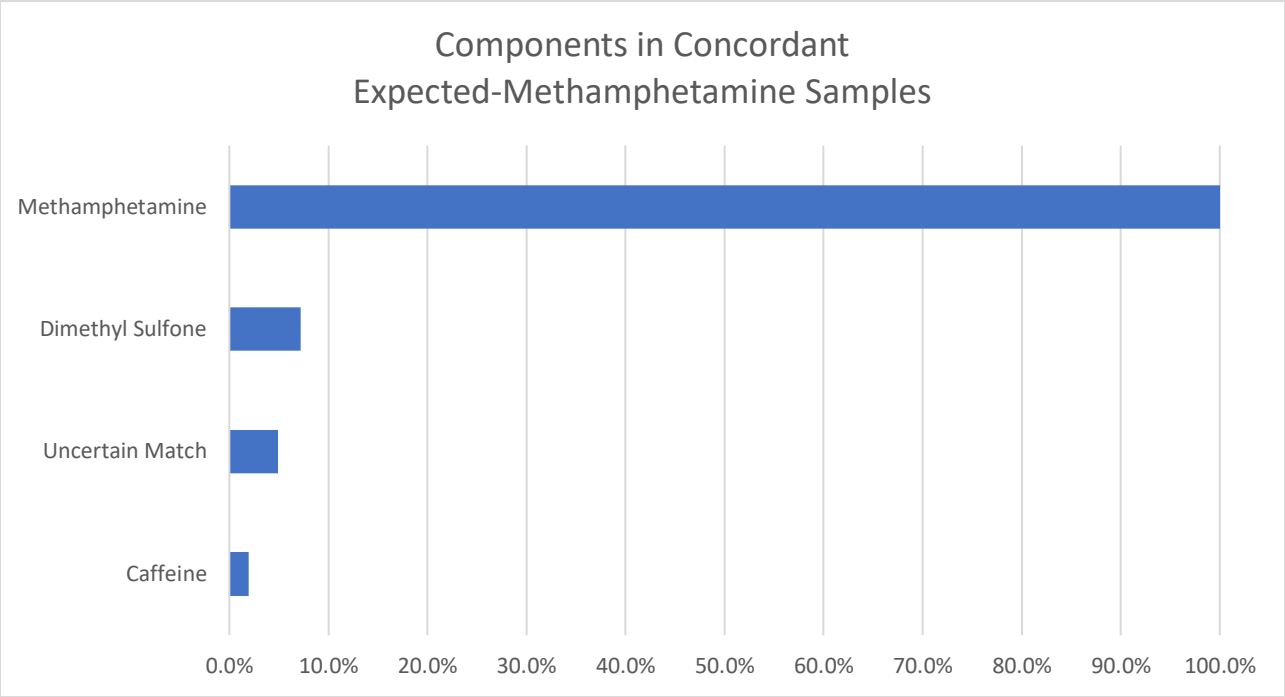

Figure 28. Bar graph of the most common substances found in expected methamphetamine samples in which methamphetamine was present, as confirmed by FTIR spectroscopy*

**Other compounds present in <1% of expected-methamphetamine samples include: erythritol, microcrystalline cellulose, fentanyl or analog, cocaine base, uncertain oil, sucrose, uncertain carbohydrate, cocaine HCl, uncertain mineral, phenacetin, methylamine, fentanyl HCl, para-fluorofentanyl, mannitol, ketamine, xylitol, sodium bicarbonate, phenethylamine, MDMA, levamisole, ephenidine and no library match.*

Psychedelics

A total of 5,435 psychedelic samples (18.7% of total samples) were submitted for drug checking in 2023. This category captures a wide range of substances–including MDMA, MDA, ketamine, LSD, 2C-B and DMT. MDMA and ketamine are the predominant substances checked in the psychedelics category (see **Figures 30** and **31**). MDMA was the most checked psychedelic substance checked throughout the year, with January having the fewest samples checked (127 samples), and a peak of 392 samples in June (see **Figure 29**). The next most frequently checked psychedelic throughout the year was ketamine, with the least number of samples checked also in March (100 samples), and the greatest number of samples checked in July (235 samples). Pop-up drug checking access points at small music festivals occurred in June and July, which could explain the increase in MDMA and ketamine checked during those months. LSD, MDA, 2C-B and DMT all had fewer than 50 samples each month throughout the year.

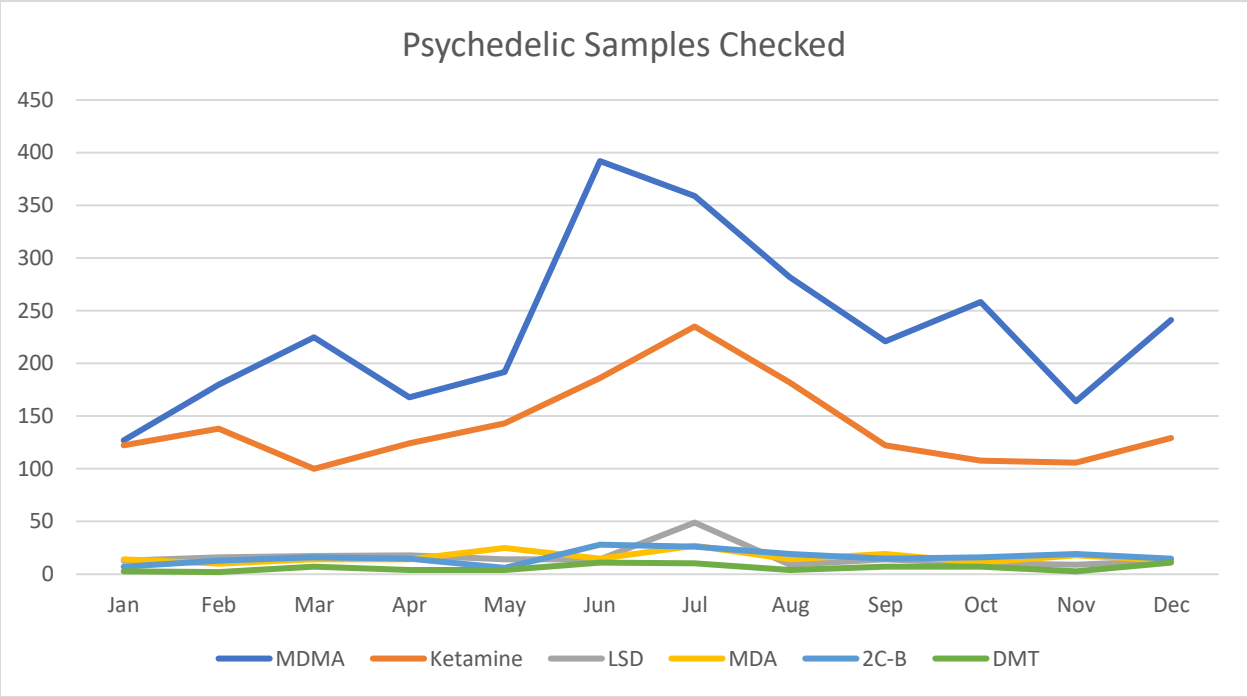

Figure 29. Number of samples checked in the psychedelic category each month in 2023 across BC*

**Other compounds checked in the psychedelics category in <1% of the total samples include: Tucibi, 5-MeO-DMT, THC, MDA and MDMA, Cannabis and derivatives, mescaline, 5-MeO-DiPT, Mushroom and derivatives, 5-MeO-MiPT, 4-HO-MET, 4-Aco-DMT, MD-X (unknown), FXE, CBD, O-PCE, methallylescaline, 2C-C, harmine, 4-PrO-DMT, synthetic cannabinoid, MXE, changa, 2C-I, THCA, tetrahydroharmine, salvia, PCP, MMDA, ketamine and MDMA, isoproscaline, DXM, DPT, DOM, DMT and DPT and MET, aMT, ALD-52, AL-LAD, 5 MeO-tryptamine, 5-MeO-MALT, 4-HO-MiPT, 4-HO-DiPT, 4-HO-DET, 4-ACO-MPT, 3-MeO-PCP, 2C-E, 2-FDCK, 1P-LSD and 1cP-LSD.*

Expected-MDMA

There were 2,809 expected-MDMA samples checked in 2023, of which 2,652 (94.4%) contained MDMA (see **Figure 30**). Of the samples that tested positive for MDMA, there were 133 samples (5%) that contained an uncertain oil and 112 samples (4.2%) that contained an uncertain match. The next most identified compound in MDMA was microcrystalline cellulose in 111 samples (4.2%). Microcrystalline cellulose is an inactive compound added as a tablet filler.

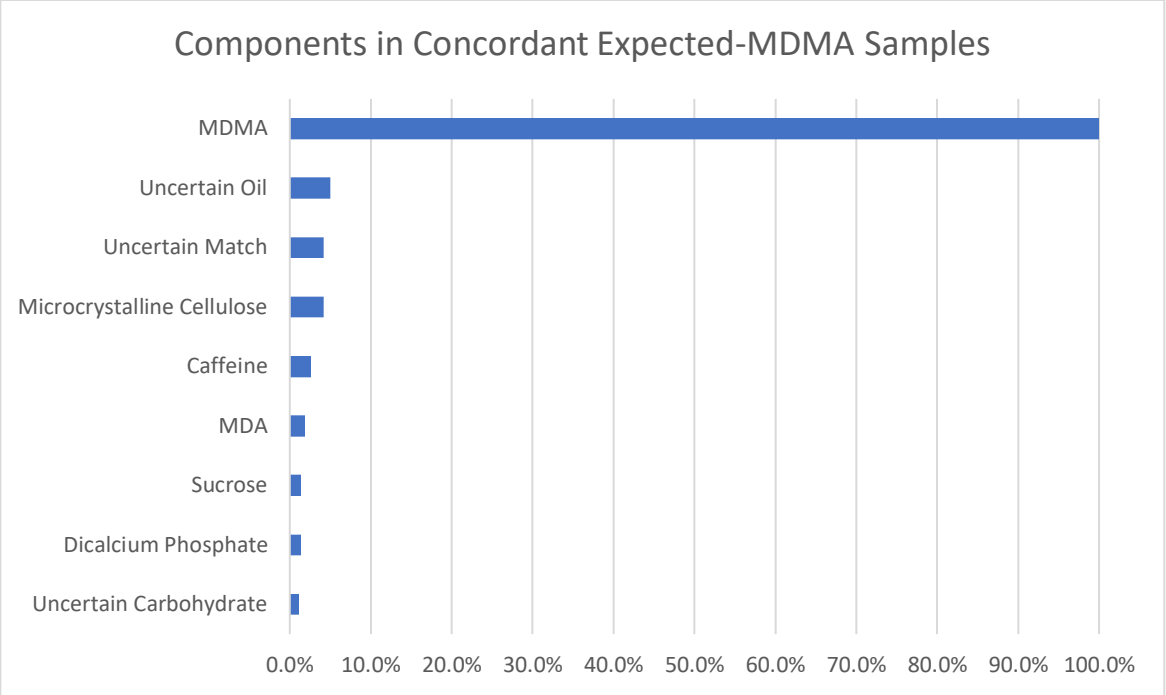

Figure 30. Bar graph of the most common substances found in expected MDMA samples in which MDMA was present, as confirmed by FTIR spectroscopy*

**Other compounds present in <1% of expected-MDMA samples include: mannitol, dimethyl sulfone, methamphetamine, safrole, uncertain mineral, glutamine, inositol, ketamine, creatine, cocaine HCl, lactose, glucose, calcium stearate, PVCA, polyethylene glycol, fentanyl HCl, erythritol, uncertain salt, tadalafil, sorbitol, heliomethylamine, fentanyl or analog and 5-MeO-DiPT.*

Expected-Ketamine

In 2023, 1,642 of the total of 1,695 (96.9%) expected-ketamine samples were found to contain ketamine (see **Figure 31**). Out of the samples that contained ketamine, a total of 70 samples (4.3%) contained an uncertain match. The most frequently identified compound other than ketamine in the 1,642 concordant samples was dimethyl sulfone, detected in a total of 86 samples (5.2%). Dimethyl sulfone is an inactive health supplement often used as a cutting agent in ketamine as it has a similar appearance in colour and crystalline form.

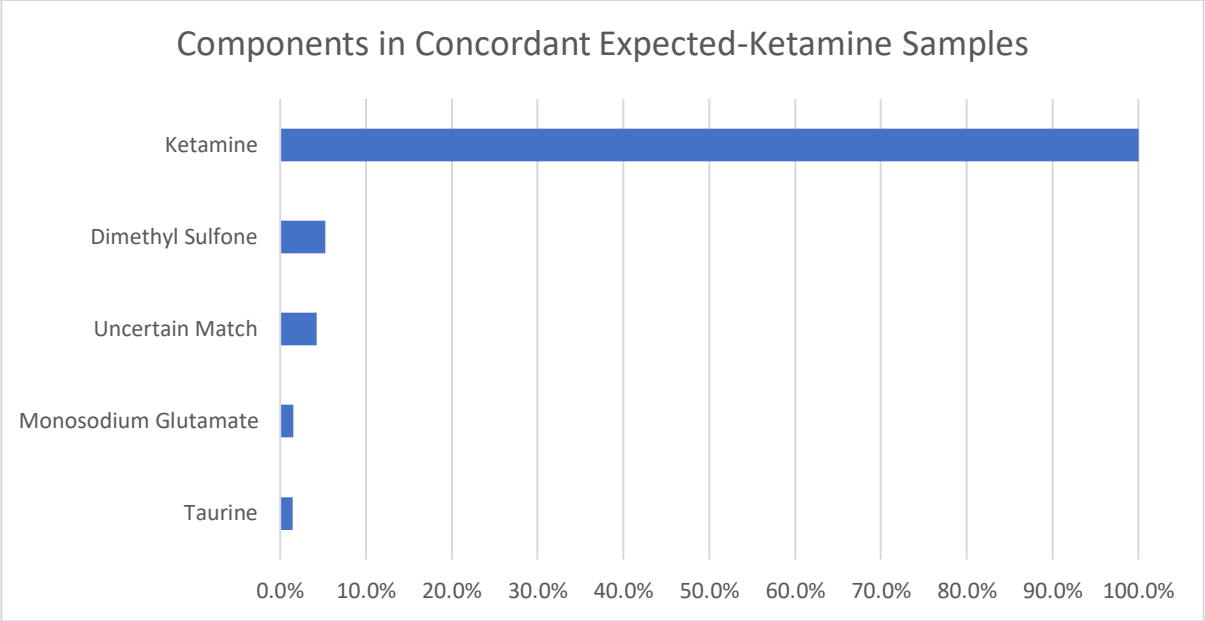

Figure 31. Bar graph of the most common substances found in expected ketamine samples in which ketamine was present, as confirmed by FTIR spectroscopy*

**Other compounds present in <1% of expected-ketamine samples include: cocaine HCl, uncertain oil, sucrose, ketamine base, phenacetin, caffeine, uncertain salt, uncertain carbohydrate, methamphetamine, MDMA, MDA, creatine, sorbitol, sodium sulfate, procaine, n-ethylnorketamine, mannitol, magnesium sulfate, inositol, FXE and, benzocaine.*

Limitations

Both technologies used at drug checking sites, the FTIR spectrometer and the immunoassay strips, have limitations in what they can detect. The FTIR spectrometer can detect up to six compounds within a given sample, including active substances, cuts and buffs, which means that in samples with more than six compounds, not all compounds may be identified. Some compounds also have similar spectra, such as fentanyl analogs, which can be difficult to differentiate from each other and produce more uncertainty in results, which speaks to the increasing complexity of the drug supply particularly in unregulated opioids. Additionally, compounds are determined by using reference libraries, and cannot be identified if the compound is not available in the library.

The FTIR spectrometer has a detection threshold of 5-10%, as previously discussed, which can impact the sample analysis and subsequent harm reduction messaging. The immunoassay strips are used in combination with the FTIR spectrometer because they have a higher sensitivity and can detect compounds present in lower concentrations, but they may not detect all fentanyl or benzodiazepine analogs consistently.[5,12] For example, carfentanil may be present in concentrations lower than the 5% threshold and can't be detected by the FTIR spectrometer, but may still be present in a high enough concentration to cause overdoses due to its high potency.[10,] Fentanyl immunoassay strips are validated to detect fentanyl in samples, but may not reliably

detect all analogs, like carfentanil.[2,3,11] Similarly, etizolam, a thienotriazolodiazepine derivative that is structurally similar to benzodiazepines is not reliably detected by benzodiazepine test strips when compared to traditional benzodiazepines, such as alprazolam.[13] Additionally, the poor water solubility of benzodiazepines pose a challenge to the test strip's ability to detect them. Lastly, other adulterants such as xylazine may also be present below the detection limit of the FTIR and may be missed.

We note that the median fentanyl concentrations were determined with a calibrated quantification model, which was trained on fentanyl HCl and not other fentanyl analogs. However, the model may have misidentified other analogs, such as fluorofentanyl, as fentanyl in some samples due to their spectral similarities. This is an important limitation to consider especially when interpreting the quantification results for months where fluorofentanyl was more prevalent. We are currently working on amendments to the model to accommodate quantifying the median concentration of other analogs as they become more prevalent.

To determine sample concordance in both opioids and benzodiazepines, samples were tested using the FTIR spectrometer and the corresponding immunoassay strip to determine fentanyl or benzodiazepine positivity. While a sample may test positive for fentanyl or benzodiazepines using an immunoassay strip, this may not be reflected in the FTIR spectrometer sample analysis due to the low detection threshold. These samples did not have the expected substance as the predominant compound when looking at the FTIR spectrometer results due to the limited detection threshold, and were determined as containing the expected drug through test strip results. This shows the importance of pairing the spectrometer results with immunoassay test strips to provide results with both a high sensitivity and specificity. However, we note test strips cannot determine the type of fentanyl or benzodiazepine analog present. Additionally, we note that samples were still considered to be concordant as long as the expected drug was present, even if another unexpected drug co-occurred.

One final limitation to consider is that the data presented in this report is not fully representative of the unregulated drug supply in BC, due to the data only being collected through drug checking sites. The limited hours and locations impact the accessibility of the service for people and may lead to a selection bias within the data, as it only captures the samples people have voluntarily brought in to be checked. Although drug checking services have expanded, some health authority regions are represented in the data by as little as one drug testing site, limiting generalizability to the region as a whole. Additionally, the limitations of the technology prevent drug checking to be performed on all types of samples (i.e., organic samples like mushrooms, cannabis).

Conclusion

Drug checking services have rapidly expanded since they first emerged as a response to the drug toxicity crisis in 2017. The data collected from BCCSU partnered community drug checking sites gives valuable insight into how the unregulated drug supply has changed over time in the province. When comparing the number of samples in first full year of drug checking services being offered in 2018 to the data from 2023, there was an expansive 509.5% increase as the number of access points, spectrometers, technicians, and overall service capacity within health authority regions continued to expand. As of 2023, drug checking services are now available in at least one location in every health authority region. By the end of 2023, there were five additional locations being accessed for sample drop off and/or on-site testing. Similar to the data in the 2022 report[14], the Vancouver Coastal Health region consistently had the most drug checks completed each month in 2023, which is largely due to one of the sites offering drug checking services eight hours a day, seven days a week in a population-dense area.

Opioids were consistently the most checked category across the year, which is partly reflective of drug checking services mostly being located at harm reduction sites such as OPS and SCS. Stimulants and psychedelics were the next most checked categories, which both peaked in the number of samples checked in June and July. This could correspond to seasonal substance use patterns associated with music festivals, as stimulants and psychedelic drugs have been found to be the most frequent drug type checked at previous music festivals.[15] The occurrence of the smaller music festivals during those months could also account for the increase in overall samples checked in these categories, as there were pop-up drug checking locations available for people on-site, increasing accessibility to the service and highlighting the utilization of drug checking in festival settings. Data from the 2023 Bass Coast and Shambhala music festivals were not included in this report, and a separate report has been produced by the Interior Health Harm Reduction Program and available through their website https://drugchecking.ca/.

When examining the concordance of the expected drug compared to FTIR and immunoassay test strip results, we found over 70% concordance across all drug categories except in the “other” category. This category had the highest proportion of samples in which the expected drug could not be confirmed as being contained in the sample nor ruled out. This is likely because the other category contains many prescription drugs, health supplements, and hormones that are not yet in any reference library. The stimulant category had the highest level of concordance, with 96.5% of samples containing the expected drug.

Looking specifically at how the unregulated opioid supply changed, benzodiazepine adulteration and increasing fentanyl concentrations in 2023 suggested a continuation of trends seen in data from previous years.[14,16,17] The 2023 data showed an increase in fentanyl concentration throughout the year. The two regions with the highest fentanyl concentrations consistently were Vancouver Coastal Health and Fraser Health, with Fraser Health observing the highest fentanyl concentration overall in January at 18%. In Vancouver Coastal, fentanyl concentrations never fell below 16%, and neared 20% by the end of the year. There was also considerable variability in fentanyl concentration across regions, creating a potential risk to individuals travelling in British

Columbia who may be unaware of the fentanyl concentration in a particular area and may not have a tolerance for that increased level. The increasing fentanyl concentration in the unregulated opioid supply poses a harm reduction challenge, as it can increase the risk of overdoses across the province.

Benzodiazepines also were increasingly present in unregulated opioid category samples (i.e., fentanyl, heroin, fentanyl and heroin, or "down" samples), starting with 50.5% of opioid samples testing positive in January, to 58.1% of samples testing positive in December. This continued the trend from 2022, which saw an increase from 28.1% in January to 51.1% in December 2022[14]. Additionally, benzodiazepine detection by FTIR increased in 2023, indicating their presence in higher concentrations (≥ the FTIR limit of detection of ~5-10%). The increasing prevalence of benzodiazepines poses a harm, the presence of both benzodiazepines and opioids when consumed can lead to prolonged sedation and increase the risk of an overdose.[18,21] The benzodiazepine most frequently detected by the FTIR spectrometer in unregulated opioid samples was bromazolam, which overtook etizolam as the dominant benzodiazepine in 2022. The change in the type of benzodiazepine detected from etizolam is important to note because it could impact the rate of benzodiazepine detection with immunoassay strips.[13] While the number of samples that tested benzodiazepine-positive consistently increased throughout the year, that could be due, in part, to the immunoassay strips being able to more reliably detect the presence of bromazolam compared to etizolam in a sample rather than strictly being caused by an increase in prevalence of benzodiazepines in the unregulated opioid supply.

In addition to benzodiazepines, xylazine continued to be found present in unregulated opioid samples in BC throughout 2023. Xylazine is a veterinary tranquilizer not approved for human use, [7,20] and is a recent emergent compound in unregulated opioids. The present of xylazine poses a risk similar to benzodiazepines as xylazine will cause a combined and prolonged sedation with the opioid if consumed together.[21] Though xylazine presence was low overall in 2023 (1.4% of unregulated opioid samples), it is difficult to comment on the true prevalence because, as previously mentioned, it is often missed by the FTIR. Xylazine immunoassay strips have been proposed as a potential approach to improving detection, however they yet to be thoroughly validated among community drug samples and are not widely used in BC[19].

While there is limited data available pertaining to the potency of fluorofentanyl relative to fentanyl, the emergence of fluorofentanyl and other fentanyl analogs in unregulated opioid samples is still of concern because it highlights the increasing unpredictability of the unregulated drug supply.[6,8] For example, as the prevalence of fluorofentanyl rose through the first half of the year and appeared to be on track to overtaking fentanyl as the main fentanyl analog by June. However, by December it was found present in less a quarter of unregulated opioid samples. This speaks to how quickly shifts in the unregulated opioid supply occur, which could pose difficulties to public health and harm reduction responses if other, more potent analogs were to emerge.

In the context of an ever-evolving, and unpredictable unregulated drug supply, drug checking services provide important information to people accessing the service, allowing them opportunities to make informed harm reduction decisions about if and how they use their drugs.

By looking at trends in the community drug checking results, public health providers and decision makers can gain insight into the current supply and be more responsive to emerging changes.

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If you would like more information
about drug checking services in BC, please visit:

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