Substance Drug Checking

Annual Review 2024

Substance Drug Checking on Vancouver Island offers free and confidential drug checking services in Victoria, Port Alberni, Comox Valley, Campbell River, Duncan, Port Hardy, and at local events. This report presents data about the drug supply on Vancouver Island for the 2024 calendar year.

9034

Samples Tested
Jan 1 - Dec 31 2024

Highlighted Findings

- 50.7% (4584/9034) of samples checked were confirmed to contain their expected active only with no other notable compounds detected.
- Samples expected to be benzodiazepines showed the highest level of misrepresentation, with 52.6% (189/359) of benzo samples containing an unexpected active. The least misrepresented samples were dissociatives, with 91.5% (569/622) of dissociatives samples containing the expected active component.
- Fentanyl continues to be the most common opioid found within the opioid–down supply, with 80.9% (2946/3641) of down samples containing fentanyl across all service locations on Vancouver Island. The median fentanyl concentration in down samples checked during 2024 was 14.7%.
- Fluorofentanyl prevalence in the opioid–down supply fluctuated between 55.1% and 10.8% between the months of January 2024 and December 2024. Throughout all of 2024, fluorofentanyl was found in 28.7% (1045/3641) of opioid–down samples with a median concentration of 5.7%.
- Ortho-Methyl fentanyl, a fentanyl analogue, began appearing in down samples during February. In October, ortho-methyl fentanyl prevalence surpassed that of fluorofentanyl. Overall, ortho-methyl fentanyl was found in 15.2% (552/3641) of down samples with a median concentration of 4.3%.
- Benzodiazepines were detected in 42.0% (1529/3641) of down samples checked in 2024. Bromazolam was the most common benzodiazepine detected in 2024, comprising 80.7% (1234/1529) of benzodiazepines detected in down samples.
- Xylazine, a tranquilizer often used in veterinary medicine, started to become more prevalent in July and eventually reached an adulteration rate of 12.3% by December. Overall, xylazine was found in 6.3% (228/3641) of down samples with a median concentration of 0.6%.
- Outside of opioid–down samples, unexpected opioids were found most frequently in samples expected to be “opioid - other” (18.7%), benzodiazepines (7.5%), and methamphetamine (7.4%). Unexpected opioids were detected in 38 (2.9%) cocaine samples, 4 (0.4%) MDMA samples, 4 (0.6%) dissociative samples, 4 (1.0%) “other” samples, and 1 (0.3%) psychedelic sample.

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Land Acknowledgement

Our project works on Indigenous land. We provide drug checking, harm reduction education and support across many territories on what is colonially known as “Vancouver Island.” We also act as a resource for these services across the province colonially known as “British Columbia.” We honour and offer respect to many Nations for their stewardship, care and leadership on these lands.

Our project originated on the territories of the lək̓ʷəŋən speaking Peoples, including the Songhees and Xwsepsum (Esquimalt) Nations, and the W̱SÁNEĆ (Saanich) Nations on whose land the University of Victoria is located. Some of the territories we are honoured to work across specifically include: Halalt, Lyackson, Meluxulh (Malahat), Puneluxutth’, Quw’utsun, Stz-uminus, and Ts’uubaa-asatx; Hupačasath and Tseshaht; K’ómoks; Laich-kwil-tach; and Gwa’Sala-’Nakwaxda’xw.

We acknowledge the inextricable links between research, colonization and racism against Indigenous Peoples, which continue to this date. Ending the violence faced by people who use drugs cannot be achieved without actively working on decolonization. We also recognize that as the majority of our staff are not Indigenous there is much more work for us to do to challenge the settler lens and colonial framework. This includes learning and growing relationships in order to take an anti-colonial and inclusive approach to the work we do.

This map was sourced from the Pacific Salmon Foundation Marine Data Centre

Setting the Foundation Towards Indigenous and Decolonial Drug Checking

Written by Sarah Littlechild, Ermineskin Cree Nation

At its core, decolonial and Indigenous centered harm reduction is about resisting against and reducing the harms of colonialism by (re)connecting back with our ancestral and cultural ways of being, knowing, and doing as First Nations, Inuit, and Metis Peoples. Although many Indigenous Nations, communities, and organizations have taken on this work, utilizing their own culturally specific wisdoms and approaches often alongside western harm reduction methods tailored to the needs of their peoples, drug checking specifically has not yet been explored in these ways. This is needed now more than ever before, as Indigenous Peoples continue to experience greater harms associated with illicit substance use in society, and drug checking can be a possible tool – in addition to culture – to support self-defined wellness. As a nêhiyaw/Ukrainian service provider and academic working alongside the Substance Drug Checking project, I was privileged throughout 2024 to begin (re)conceptualizing possibilities for drug checking through Indigenous, culturally centered, and decolonial worldviews, practices and settings.

This work started (and has continued) through building relationships with Indigenous service providers and community members. The involvement of Substance at Indigenous and cultural events in 2024, such as with the Victoria Native Friendship Center and QomQem Coastal Connections, allowed us as to begin visioning for what decolonial and Indigenous centered drug checking could mean, how it could look, and what it could feel like. Within many of these spaces, Substance has provided drug checking, together with cultural resources like plant medicine bundles, alongside Indigenous-led organizations which provided access to Elders and Knowledge Keepers, drummers, singers, food, and ceremony. Through the personal experiences, reflections, and team conversations that were born from these shared events, combined with my own cultural knowledge as a nêhiyaw iskwew (woman) and existing concepts of Indigenous harm reduction, a (w)holistic framework for possible Indigenous drug checking approaches was developed. Specifically, I considered the teachings and values embedded within the process of gathering and braiding sweetgrass, as passed to me through my family and ancestors, to discuss these possibilities and my own learning journey within drug checking.

Through discussing the considerations I have had around drug checking since joining Substance, I concluded that drug checking can potentially work best for Indigenous Nations, communities, and organizations if it: supports healing for everyone involved; reflects culturally specific natural laws and teachings of the land; recognizes spirit and ceremony; is relational, respectful, and reciprocal; and centers resilience and decolonization throughout its services. Many further considerations around decolonial and Indigenous approaches to drug checking can be found in a newly written paper that is soon to be published, and we welcome all feedback from the communities we walk alongside in this project!

Beyond this framework, our team also engaged in (w)holistic wellness-focused and decolonial learning activities, including getting humbly brushed off by a Quw'utsun Knowledge Keeper at Goldstream Park, and learning about Indigenous harm reduction and trauma informed practices. We also held an art drop-in event for anyone interested in joining National Day for Truth and Reconciliation, where we combined art, food, cultural medicines, and drug checking education. You could say that, out of the framework, we started putting some of the above principles into action. However, much more work is needed to ensure First Nations, Inuit, and Metis voices, values, and needs are meaningfully heard in drug checking, and that Nations, communities, and organizations have our full support to practice it in their own distinct ways – by them, for them – if desired. Ultimately, 2024 was an amazing year of growth, change, and deep reflection for Substance, none of which could be possible without the relationships we have made within our community; we are grateful to each and every person who has connected with us and supported the development of this framework.

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Annual Review 2024

Narrative Report

In 2024, our service offered vitally important information throughout the community of so-called “Victoria”, the larger geographic region of so-called “Vancouver Island”, and within the province of “British Columbia”. In the eighth year of the overdose crisis fueled by an erratic and inconsistent unregulated drug supply, drug checking remains one of many vital community defenses against further loss of life due to drug toxicity.

Our main point-of-care site located within the North Park community of “Victoria” continues to thrive. All walks of life are welcome in this space to learn about their substances via a world-class suite of instruments. We receive samples that arrive by mail and through outreach conducted by Substance staff and partner organizations. We continue to receive samples for confirmatory analysis from our distributed sites on Vancouver Island and from several sites across the province in partnership with the British Columbia Centre on Substance Use (BCCSU).

Our busiest month this year was June, where we checked a record number of samples for 2024–978 to be exact, just 82 samples short of our all time record set in June 2023. For nine out of twelve months in 2024, sample volumes were comparable to 2023. The exceptions being September, November, and December where sample volumes were less than the same months in 2023. In September and November, sample volumes were less than those same months in 2022.

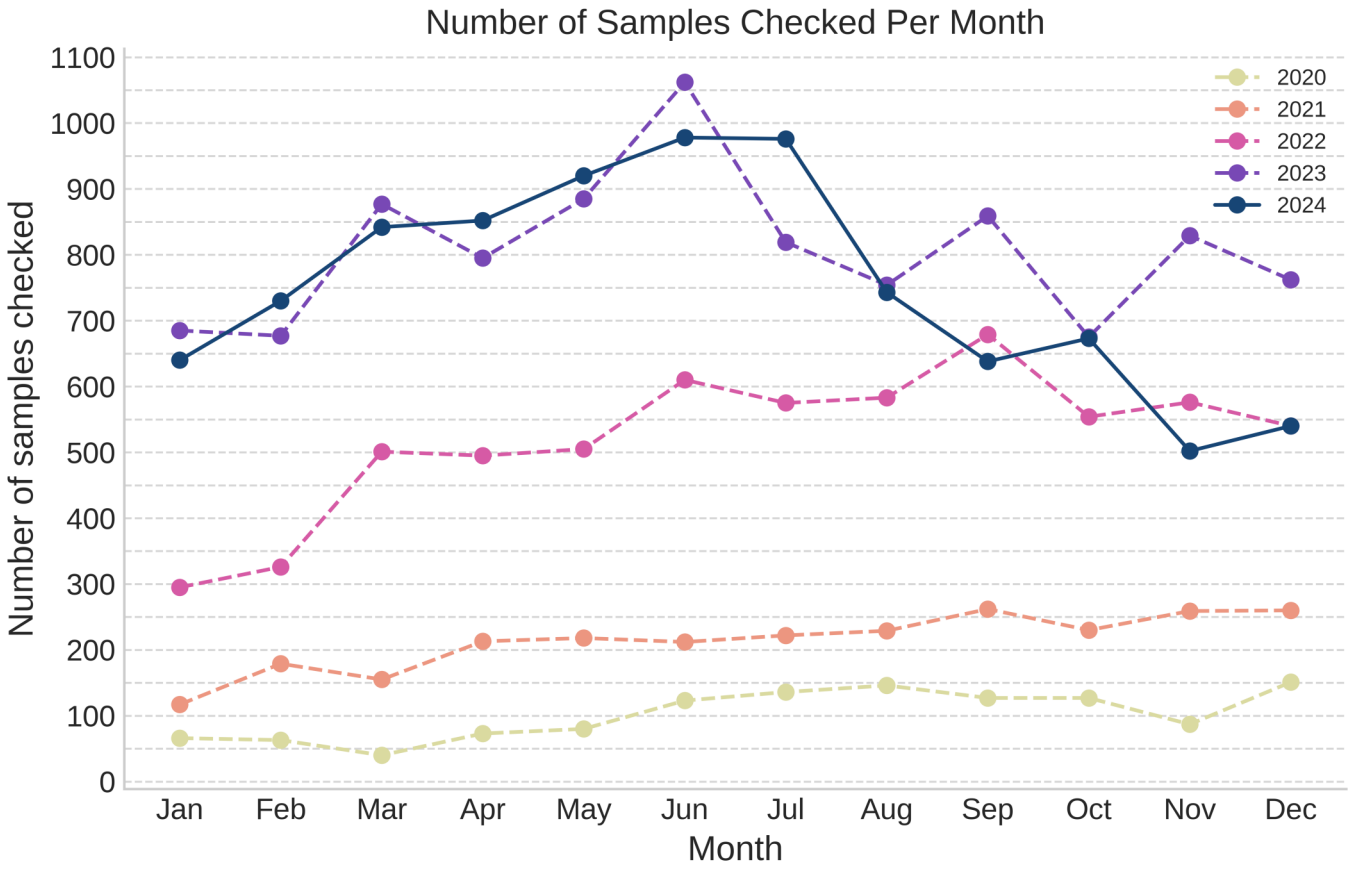


Figure 1. Number of samples checked per month between 2020 and 2024, across all service locations.

Sample Volumes Per Service Location

This year we continued to provide secondary analysis via paper spray mass spectrometry to our distributed sites located in overdose prevention sites operated by the Port Alberni Shelter Society, the Vancouver Island Mental Health Society in “Campbell River”, Lookout Housing and Health Society in “Duncan”, Island Health Mental Health and Substance Use in “Port Hardy”, as well as AVI Health and Community Services in the “Comox Valley” and “Campbell River”.

At our point-of-care site in “Victoria”, sample volumes decreased by 12.1%. However, this was not the case for our distributed sites in “Campbell River” and “Duncan”, which had 47.8% and 49.6% increases in sample volumes respectively. During late 2023, we added an additional site in “Campbell River” which is one factor that could have lead to their increase in sample volumes. As for our distributed site in “Duncan”, they were able to add an additional staff member to the floor of their overdose prevention site, which may have allowed them to more consistently check samples. Overall, across all service locations, we observed a 6.7% decrease in sample volumes compared to 2023.

Service Location	Number of Samples 2024	Number of Samples 2023	Percent Change
Campbell River	337	228	47.8%
Comox Valley	327	343	-4.7%
Duncan	383	256	49.6%
Outreach	2105	2120	-0.7%
Port Alberni	168	276	-39.1%
Port Hardy	36	N/A	N/A
Substance	5678	6456	-12.1%
Overall	9034	9679	-6.7%

Table 1. Number of samples checked and percent change by service location.

Here in so-called “Victoria” our outreach program collects samples from various housing and supervised consumption sites. One goal of the outreach program is to help more people access drug checking, another goal is to create and nurture connections with community members and staff from other organizations. One way we maintain these connections is by sharing information about the local drug supply through our weekly reports (which were redesigned this year based on community feedback) and monthly reports, in addition to other resources made or maintained by Substance such as drug pamphlets and benzo equivalency charts. Another aspect of our outreach program are the teaching days we operate where anyone can learn more about drug checking and even how to use some of the instruments that we use to check drugs.

Teaching Days

Written by Lea Gozdzialski

“That’s so cool!”—a common phrase sung from within the little “red door room” around the corner from Substance. “What’s going on in here?” we are asked, as folks poke their head in, intrigued by the homemade sign, open door, and excitement heard from within. “Come on in, let me show you!”

Teaching Days *(Continued)*

In 2024, we hosted a weekly drop-in space where folks accessing drug checking were welcomed to try their hand at checking their own substances with an IR spectrometer, one of the instruments we use at Substance. "Teaching Thursdayz" was initially established as a step towards confronting the inequities in access to information and technology in drug checking by carving out a space for knowledge co-creation. The past year has seen many visitors, teachers, and learners engaged in teaching days. We have so much gratitude to all of those who have trusted us with their ideas, experiential knowledge, stories of joy and grief, frustrations, and questions. Whether nerding out on lasers and functional group chemistry, ranting about collective frustrations with the limitations of drug checking (and with the world), or celebrating "aha" moments, every interaction leaves us feeling deeply connected. We look forward to seeing you all at teaching days in 2025!

Some scenes from Teaching Days

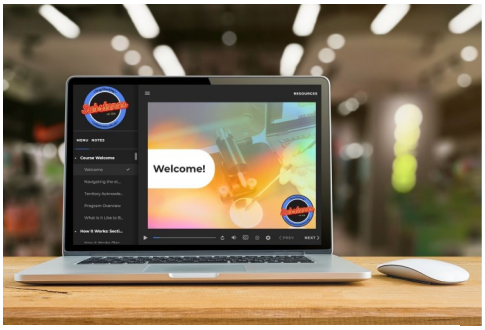
Distributed Drug Checking Training Program

Written by Taylor Teal

2024 was a big year for training research and development at Substance!

At the beginning of the year, we onboarded our newest and most northern site with the addition of Port Hardy Mental Health and Substance Use to the Distributed Drug Checking model. Training with new staff at other existing sites continued via our original training program until April of 2024, when we paused to focus on sharing what we learned from our research on the training, and to work on some exciting updates.

In September, we received confirmation that our article on the Distributed Drug Checking Training Program would be published in the Journal of Public Health Management and Practice. This article describes the results of evaluation research we conducted from May 2022 to March of 2024, including lessons learned and implications for practice. You can check out the article by visiting the research section of our webpage or heading to page 84.



Mockup of the e-learning welcome page

November saw the launch of our newly created, highly interactive eLearning, wherein the virtual curriculum of the distributed training was transformed into an asynchronous format. The goal of this shift was to make the training even more scalable and sustainable moving forward. The new multimedia-rich training includes optional narration, captions, and many activities, with learning pathways for new and past distributed drug checking trainees. We're happy to say that our first groups of learners have successfully completed the new training and we're excited for its continued roll out in 2025!

Event and Festival Drug Checking

In total, we operated drug checking at seven music festivals and two community events during the summer of 2024, referred to as "festival season" by some. At these gatherings, our services reached a total of 181 service users and provided valuable, potentially life saving information about the composition of 251 samples. The busiest event was Otherworld, Vancouver Island's regional burning man event, where we checked 115 samples for 78 unique Otherworldians (a.k.a. service users). The second busiest event was Samsara Music Festival where we checked 43 samples for 30 unique service users over the course of three days. Just shy of Samsara in terms of sample volume was Pachena Bay Music Festival, were we checked 39 samples for 29 unique service users. More information about the events and festivals we checked drugs at can be found below in Table 2.

Event Name	Event Date(s)	Event Location	Service Users	Samples Checked
Otherworld	Jun 06 - 09, 2024	Cowichan Valley, BC	78	115
TILT at Phillips	Jul 05 - 06, 2024	Victoria, BC	3	3
Pachena Bay Music Festival	Jul 19 - 21, 2024	Bamfield, BC	29	39
Indigenous Wellness Day	Jul 22, 2024	Victoria, BC	3	3
Blackberry Jam Music Festival	Aug 03, 2024	Denman Island, BC	1	1
REVERB at Phillips	Aug 09 - 11, 2024	Victoria, BC	10	11
Samsara Music Festival	Aug 09 - 11, 2024	Jordan River, BC	30	43
International Overdose	Aug 29, 2024	Victoria, BC	4	8
Rifflandia Music Festival	Sept 13 - 15, 2024	Victoria, BC	23	28
All Events			181	251

Table 2. Number of samples checked at festivals and events in 2024.

Drug checking at events also acts as a form of outreach by engaging people who are new to having their substances checked. As part of our intake survey, we ask whether or not a service user has accessed any drug checking service before. When looking at the data from the events this summer (Figure 2), we find that 51.4% (92/179) of service users who responded to the intake survey had not used a drug checking service before. When compared with data collected at our storefront in "Victoria", only 20.9% (233/1073) were new to drug checking. Suggesting that event based drug checking is a viable method to expand the reach and accessibility of drug checking, especially to new service users. For more information about event and festival drug checking, read our 2024 Event and Festival Report.

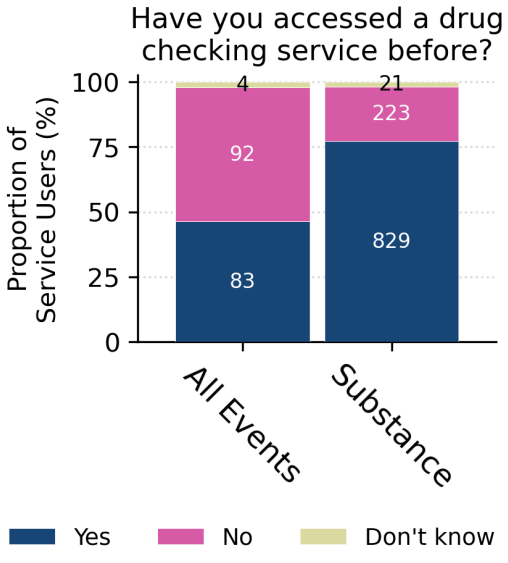


Figure 2: Proportion of new service users at all events versus at our storefront

What were people bringing to get checked?

People bring us a wide variety of substances that can be grouped into different drug classes. The donut chart below aggregates the total number of samples we checked by their expected substance (i.e. the drug category reported by the service user), inclusive of all service locations. The consistent use of drug checking for a diverse range of drug categories, throughout the entire year, and across the island, demonstrates the continued need for both universal and population-targeted approaches to drug checking services and the accessibility of services.

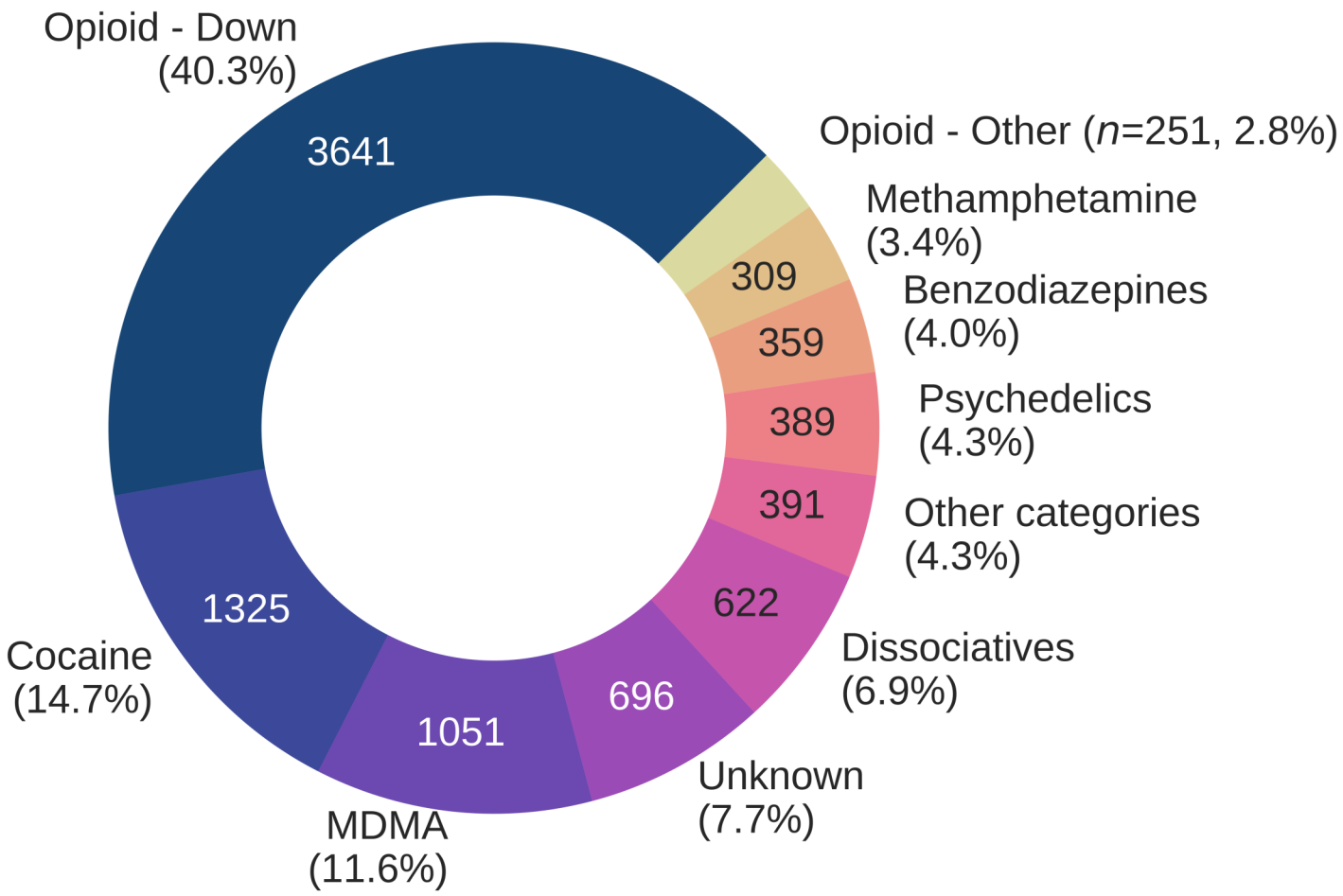


Figure 3. Number and proportion of samples checked by expected drug class, across all service locations.

Some example[1] drugs within each class are as follows: **Opioid - Down**: fentanyl, ortho-Methyl fentanyl, and heroin. **Cocaine**: cocaine HCl (powder/soft), cocaine base (crack). **MDMA**: MDMA, MDA. **Dissociative**: ketamine, novel dissociatives like O-PCE. **Benzodiazepines**: bromazolam, alprazolam (Xanax), diazepam (Valium), etizolam. **Psychedelics**: 2C-B, DMT, LSD. **Opioid - Other**: hydromorphone (Dilaudid), oxycodone. **Other categories**: 3-MMC, Adderall, methylphenidate (Ritalin), GHB, quaaludes, cannabis products, steroids, novel "designer drugs." **Unknown**: samples where the expected drug was not known by the service user.

[1]This list is not comprehensive to every expected drug within each subcategory

What were people getting checked by location?

The expected substance data presented on previous page can be separated by sample collection location/method. Each site shows its own unique proportion of the types of samples checked, and these differences are based partially on the type of site that is offering drug checking (OPS vs. storefront), on community engagement with the service, and on the regional markets overall. Regardless of the type of service offering drug checking, drugs representing the full suite of drug classes are seen across Vancouver Island.

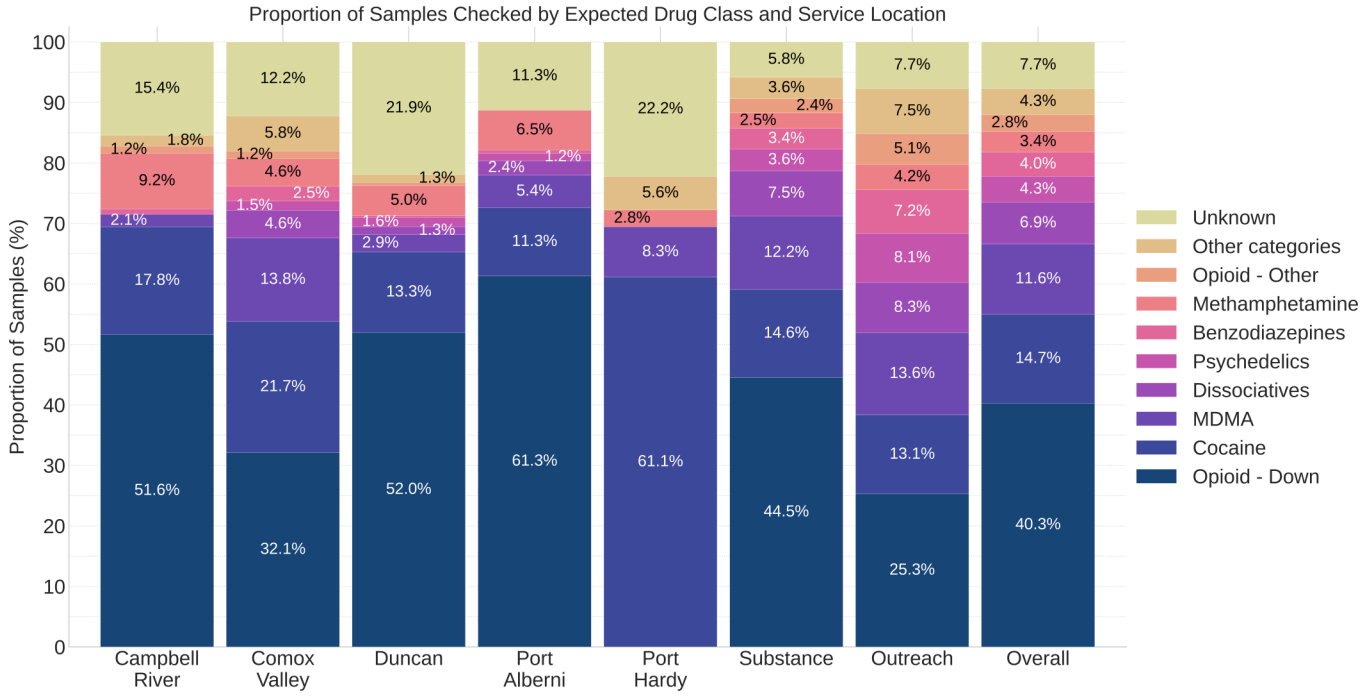


Figure 4. Proportion of samples checked by expected drug class and service location. Proportions less than or equal to 1.0% are omitted for readability.

Expected Substance Class	Campbell River	Comox Valley	Duncan	Port Alberni	Port Hardy	Substance	Outreach	Overall
Opioid - Down	174	105	199	103	0	2528	532	3641
Cocaine	60	71	51	19	22	827	275	1325
MDMA	7	45	11	9	3	690	286	1051
Dissociatives	0	15	5	4	0	423	175	622
Psychedelics	0	5	6	2	0	205	171	389
Benzodiazepines	3	8	1	1	0	194	152	359
Methamphetamine	31	15	19	11	1	144	88	309
Opioid - Other	4	4	2	0	0	134	107	251
Other categories	6	19	5	0	2	202	157	391
Unknown	52	40	84	19	8	331	162	696
Total	337	327	383	168	36	5678	2105	9034

Table 3. Sample counts per location.

Definitions of Composition Classes

All samples, regardless of expected substance or service location, are checked using all[1] analytical techniques to determine what active ingredients, adulterants, and cutting agents were present. Samples are then grouped into the following categories based on the composition we found in relation to the expected substance:

- ***"Expected Active Only"***: samples that were as expected with no other notable[2] compounds detected[3]
    - Example: An expected MDMA sample that was found to be MDMA with no cuts or adulterants detected
- ***"Expected + Unexpected Actives"***: samples that contained the expected drug and unexpected active compounds
    - Example: An expected cocaine sample that was found to contain cocaine and levamisole
- ***"Unexpected Active Only"***: samples that contained an unexpected active but the expected drug was not found
    - Example: An expected alprazolam (Xanax) sample that was found to be bromazolam instead
- ***"No actives found"***: samples where no active compounds were detected3
    - Example: An expected hydromorphone (Dilaudid) tablet that was found to be a sugar pill
- ***"Unknown composition"***: samples where analysis was performed but we were unable to determine the composition, these samples likely contain a compound not present in either libraries

[1]*Some samples are too sparse to run all tests, in which case the instrument best suited for the analysis of that particular drug class is prioritized.*

[2] *"Active" or "notable" compounds are those which produce a psychoactive effect or are pharmacologically relevant (may have the potential for unexpected effects). While psychoactive/pharmacologically relevant, caffeine is an exception that is considered an "inactive cut" in our reporting.*

[3]*See limitations below*

Limitations

There are limitations to a drug checking result based on the technologies used, the analysis methods implemented, and the nature of the sample itself. The immunoassay strip tests used to detect fentanyl analogues and benzodiazepines are remarkably sensitive, but they are not tailored to detect all known analogues, nor are the concentration cut-offs consistent between different analogues. For example, etizolam, while often included with benzodiazepines is in fact a thienodiazepine derivative and has limited reactivity with benzodiazepine strip tests. Some compounds like benzodiazepines, cocaine base, and fluorofentanyl base also have poor water solubility which affects the reliability of strip test results when examining these samples.

FTIR has four primary limitations in the context of our service: a relatively high limit of detection, incomplete spectral reference libraries, challenges when analyzing mixtures, and non-quantitative results. The limit of detection for FTIR is around 5% (weight/weight) meaning low concentration compounds in a sample may not be detected on FTIR. Compound identification on FTIR relies on reference libraries - databases of FTIR spectra for drugs. Our spectral libraries are not exhaustive, especially for new/novel compounds and some pharmaceuticals. Samples containing multiple components present a challenge for FTIR as the mixture signal becomes increasingly difficult to interpret; we often limit our FTIR mixture analysis to 3-5 compounds and FTIR does not produce validated concentration estimates of compounds in a mixture. Finally, organic samples like cannabis and mushrooms are not suited for analysis on FTIR as the complex signal from organic material obfuscates the spectrum.

Limitations *(Continued)*

Paper spray mass spectrometry (PS-MS) is used to alleviate some of the aforementioned hurdles, but comes with limitations of its own. We primarily operate the PS-MS in using a targeted method meaning we scan every sample for a specific list of compounds. The current targeted method contains 106 different drugs spanning a wide range of drug classes. The list of compounds included in our targeted method can be found here:

PS-MS Targeted Compounds: https://substance.uvic.ca/paperspray

The sensitivity in detecting compounds on this list (the limit of detection) varies by compound, but most compounds can be detected in samples down to 0.1% (weight/weight). In addition to being able to *detect* compounds at low concentration, the targeted method allows us to *quantify* these compounds in a sample as well. In May of this year, our PS-MS method was updated. Previously the targeted method was calibrated over a range of concentrations spanning around 0.1% to 80% (weight/weight) for most compounds, though some drugs like bromazolam had an upper limit of quantitation set to 25%, and other drugs such as fluorofentanyl had an upper limit of quantification set to 40%. Now however, all compounds have an upper limit of 50%. If a sample contains a higher concentration of a compound than the PS-MS limits of quantitation, then only the upper limit will be reported. For example, the upper limit of quantitation for fentanyl on the PS-MS is 50% - any sample containing more than 50% fentanyl will be flagged as “>50%”. Due to the change in PS-MS method, you may see both “>50%” and “>80%” reported in quantification tables throughout this report.

When a compound is not on the list, it can be identified through untargeted analysis by the compounds precursor and/or product ions. However, PS-MS cannot determine chemical structure and compounds that are have the same mass (otherwise known as being “isobaric”) or are structurally similar to other compounds are difficult to differentiate. Concentrations cannot be provided for compounds detected through this untargeted analysis. Some drugs like GHB, steroids, sugars, and oils do not ionize consistently on PS-MS meaning we cannot analyze these samples to identify the compound.

Purity analysis is outside of the scope of our service and is beyond the capabilities of our instruments. “No cuts detected” certainly does not mean “pure”. Purity, in a chemical sense, could be defined as the lack of impurities. Impurities could exist from the synthesis process where there are unintentional byproducts, leftover alkaloids, and residual precursors and solvents, could arise as breakdown products from storage and handling conditions, and could be intentionally added cutting agents or adulterants. Considering many possible sources of impurities, there is a massive list of compounds that could be present in sample but many of these compounds may be present in such trace levels that we are unable to detect them on our instruments. Even with PS-MS, where detection could be possible, the list of possible impurities to screen for is massive and the process to identify and quantify them would require extensive method development beyond the objectives/capabilities of our point-of-care service.

Results

Opioid–down

Opioid–down or more commonly just “down” refers to samples that are expected to be fentanyl, fentanyl analogues, and/or heroin. Other subcategories of down exist, most commonly, “benzo-down”, which describes samples that are expected to contain both an opioid and a benzodiazepine, and “tranq-dope”, which describes samples containing both an opioid and xylazine.

Due to the ever-changing nature of the down supply, the ubiquity of low concentration, potent synthetic compounds, and the frequency of unexpected polysubstance mixtures means that a majority of service users with down samples are seeking both trace compound *detection* and *quantification.* Opioid–down is the most prevalent expected substance class that we check across all locations and makes up around 25.3% - 61.3% of the samples that we check, depending on service location (see Figure 4 on page 9).

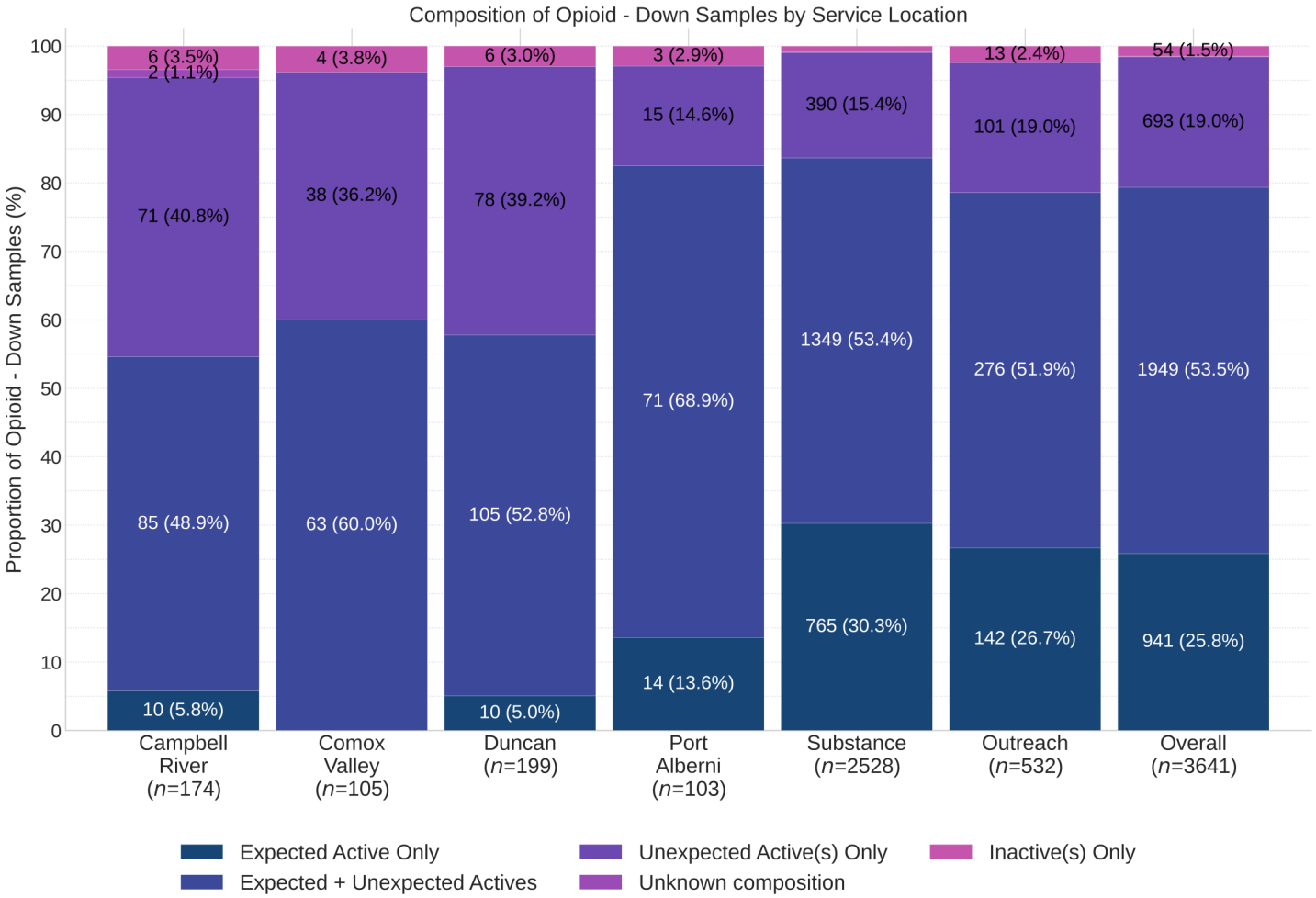


Figure 5. Proportion and number of Opioid–down samples checked by service locations, grouped by composition class (see page 10 for definitions). Proportions less than or equal to 1.0% are omitted for readability.

Opioid–down Adulteration

The unregulated Opioid–down supply shows the highest level of adulteration compared to the other drug classes that we check. 53.5% of down samples contained the expected active (fentanyl or heroin) *in addition to* other unexpected actives. 19.0% of down samples did not contain the expected active and were found to contain only unexpected actives instead. Three primary categories of drugs that constituted the majority of unexpected actives that found within the down supply are benzodiazepines, fentanyl analogues, and xylazine.

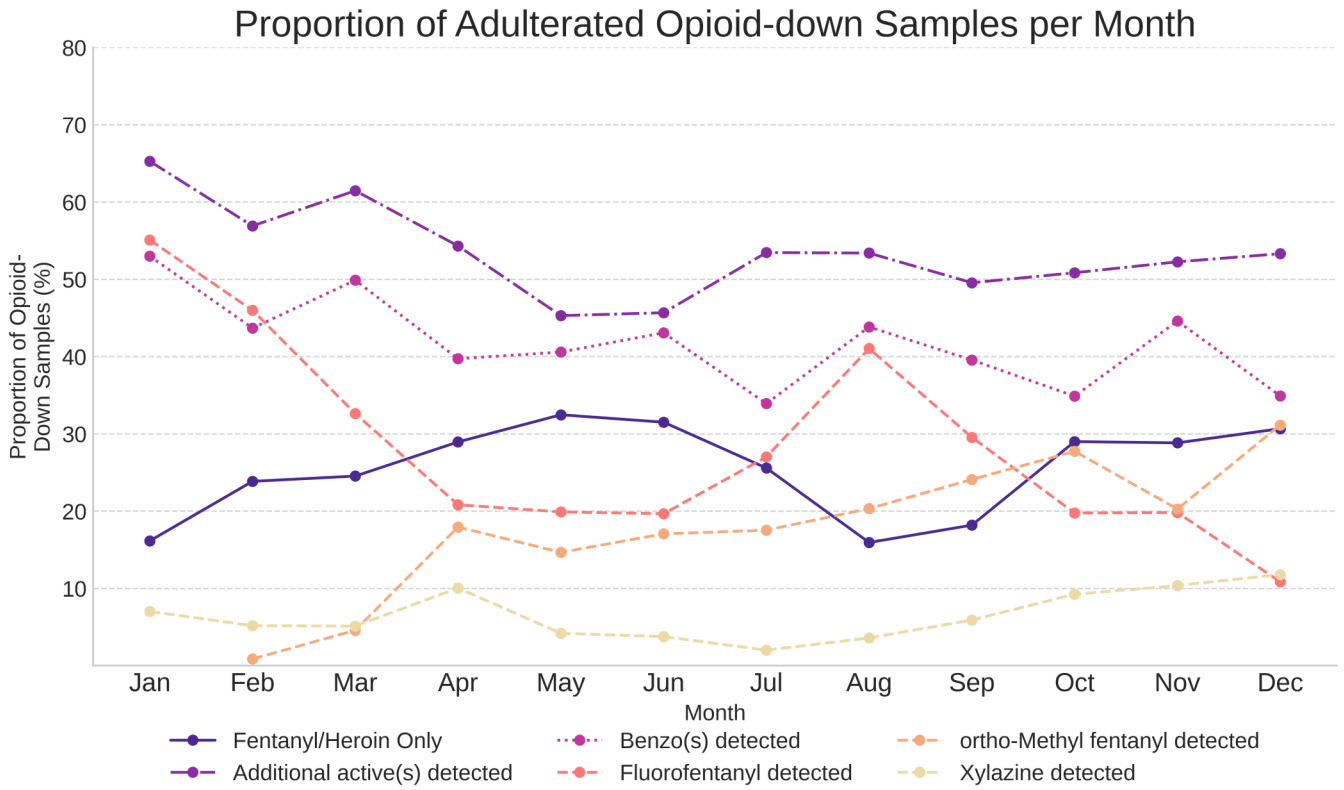


Figure 6. The proportion of expected opioid–down samples checked in 2024 that contained fentanyl/heroin as the only detected actives **(solid dark blue)**, opioid–down samples with an additional active detected **(dot-dashed purple)**, opioid–down samples that contained benzodiazepine-related drugs **(dotted magenta)**, opioid–down samples that contained fluorofentanyl **(dashed salmon)**, opioid–down samples that contained ortho-Methyl fentanyl **(dashed orange)**, and opioid–down samples that contained xylazine **(dashed Lime)**. Data are inclusive of all service locations.

At the start of the year, fluorofentanyl was the most common fentanyl analogue detected within the opioid–down supply, being detected in 55.1% of opioid–down samples checked in January of 2024. However, by December, the proportion of opioid–down samples that contained fluorofentanyl fell to only 10.8%. Overall, in 2024, fluorofentanyl was found in 28.7% (1045/3641) of down samples.

In February of 2024 we began to notice a new fentanyl analogue appearing the down supply, ortho-Methyl fentanyl. By the first week of April, we added ortho-Methyl fentanyl to our PS-MS target list. Over the course of the year, the proportion of opioid–down samples adulterated by ortho-Methyl fentanyl continued to trend upwards, surpassing fluorofentanyl in October and ultimately reaching 31.1% of down samples in December. Overall, ortho-methyl fentanyl was found in 15.2% (552/3641) of down samples checked in 2024.

Opioid–down Adulteration: Benzodiazepines

In 2024, the prevalence of benzodiazepines in the down supply remained high throughout the year, with 42.0% of all opioid–down samples checked in 2024 containing a benzo, aggregated across all locations. This represents a 5.4% decrease in the prevalence of "benzo-down" compared to 2023. January showed the highest prevalence of benzodiazepines in the down supply (53.0%) and July showed the lowest prevalence of benzodiazepines in the down suppl (33.9%).

By region, Campbell River showed the highest level of benzodiazepine adulteration with 90.5% (95/105) of opioid–down samples containing benzodiazepines; Outreach samples showed the lowest degree of benzodiazepine positivity with 32.9% (175/532) of down samples containing benzodiazepines.

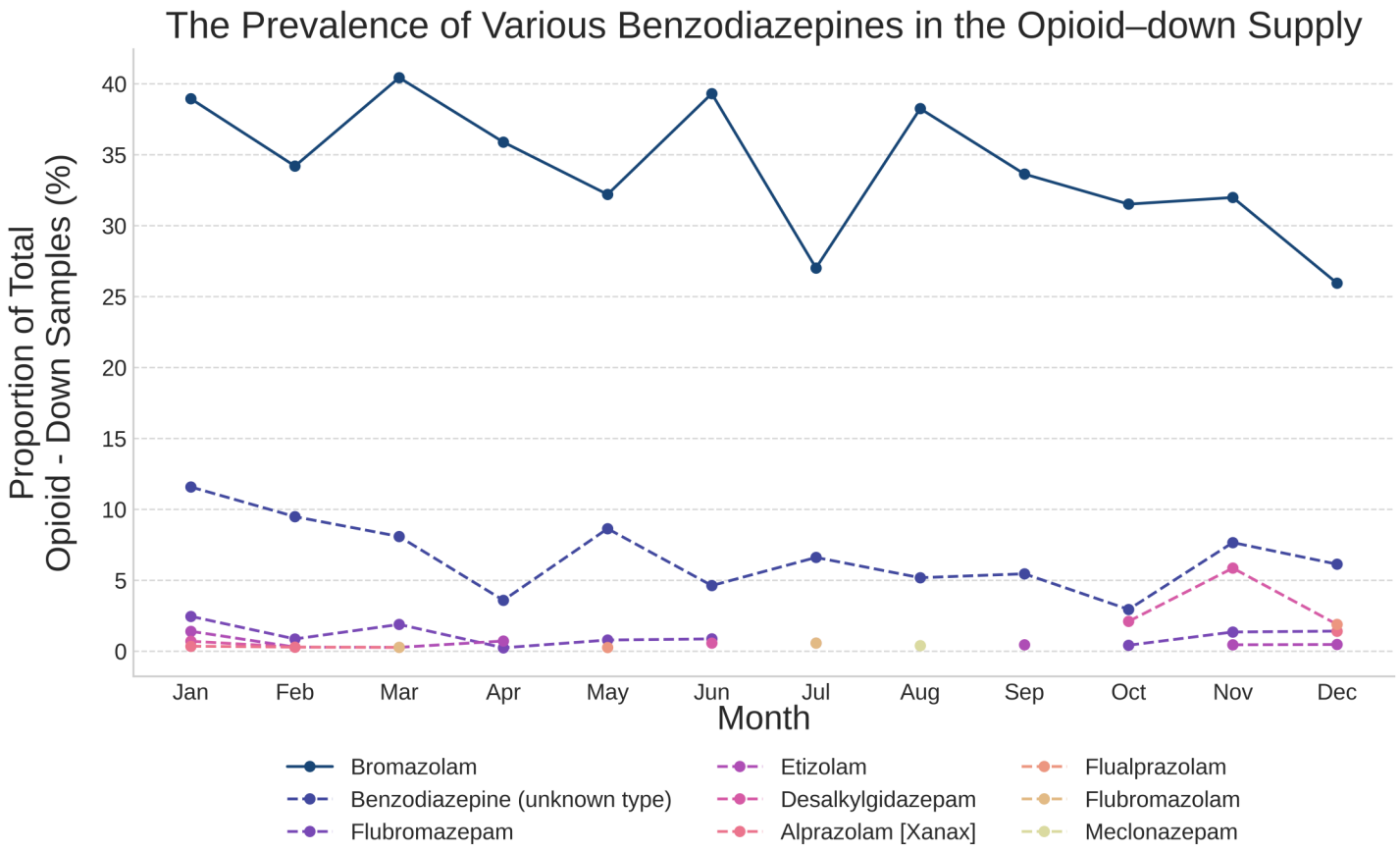


Figure 7. The proportion of expected opioid–down samples checked in 2024 that contained bromazolam **(solid dark blue)**, Benzodiazepine (unknown type) **(dashed blue)**, flubromazepam **(dashed purple)**, etizolam **(dashed violet)**, desalkygidazepam **(dashed magenta)**, and other benzodiazepines. Data are inclusive of all service locations.

Across all months of 2024, bromazolam was the most common benzo found in the down supply, found in 80.7% (1234/1529) of benzo-positive down samples or 33.9% (1234/3641) of all down samples. This makes bromazolam the most common adulterant in the down supply. The second most common benzodiazepine we found was benzodiazepine (unknown type), which was found in 15.7% (240/1529) of benzo-positive down samples or 6.6% (240/3641) of all down samples. Benzodiazepine (unknown type) results occur when a sample tests positive for benzodiazepines via immunoassay strip tests but the identity of the benzo(s) could not be determined via FTIR or PS-MS analysis.

Opioid–down Adulteration: Xylazine

Xylazine-positive down samples, a.k.a. “Tranq-dope” comprised 6.2% of all expected down samples checked in 2024. This represents a 1.4% increase in “Tranq-dope” from 2023, where 4.8% of all down samples contained xylazine. As shown below in Figure 8, a majority (7/12) of months in 2024 showed a higher adulteration rate for xylazine compared to 2023. Interestingly, the proportion of down samples containing xylazine in 2024 is equal to the proportion of down samples containing xylazine in 2022. However, all months of 2024 showed lower adulteration rates than the record high set in June of 2022.

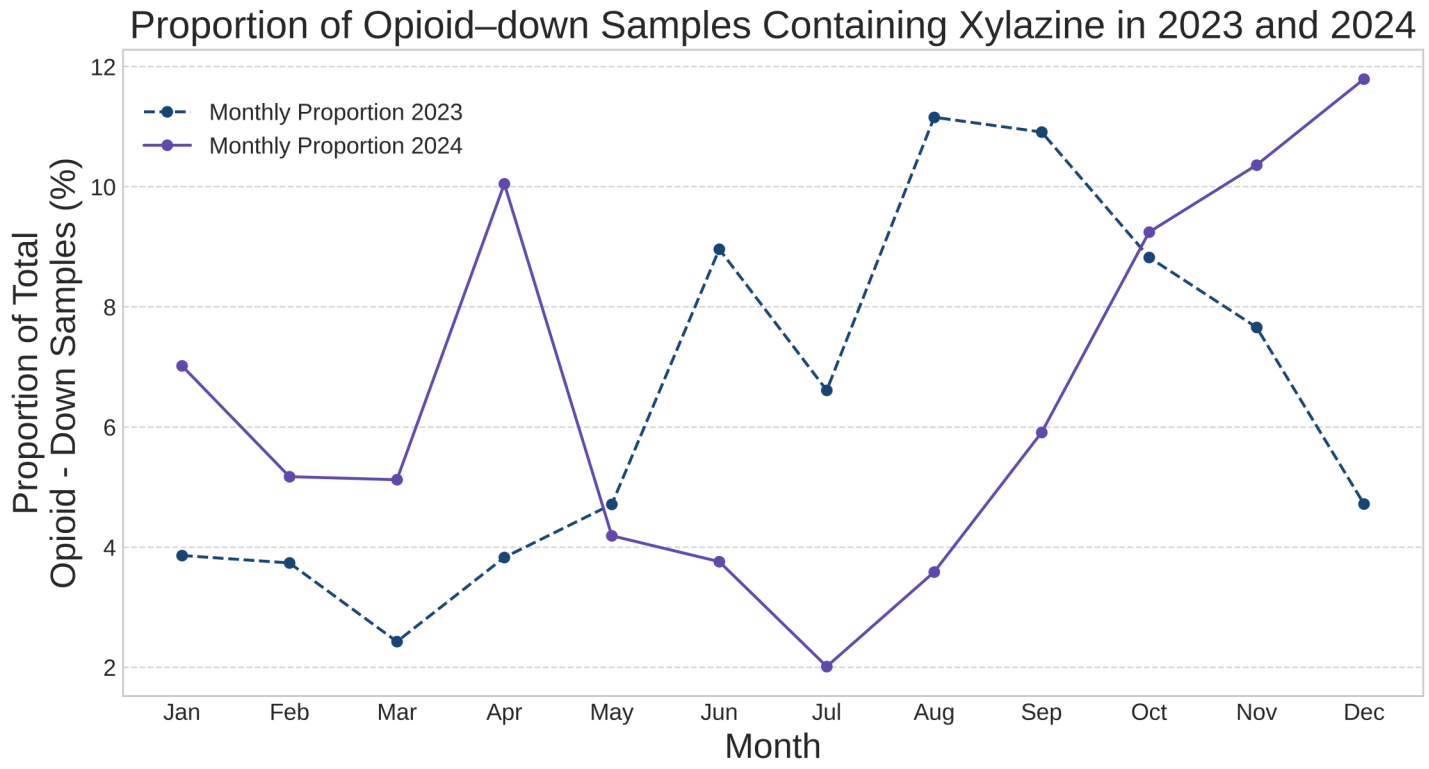


Figure 8. Prevalence of xylazine in opioid-down samples in 2024 and 2023 across all service locations.

Service Location	Proportion of Opioid Samples Containing Xylazine	Service Location	Proportion of Opioid Samples Containing Xylazine
Campbell River	10.3%	Port Hardy	N/A
Comox Valley	21.9%	Substance	5.4%
Duncan	9.0%	Outreach	5.6%
Port Alberni	1.0%	Overall	6.2%

Table 4. Prevalence of xylazine in opioid-down samples in 2023 per service location

Per service location we found that for the second year in a row, our Comox Valley service location had the highest prevalence of “Tranq-dope”, with 21.9% (Table 4) of down samples containing xylazine, followed by Campbell River with 10.3%, and Duncan with 9.0%. Our Port Alberni service location had the lowest proportion of “Tranq-dope” samples, with only 1.0% of the down supply being contaminated with xylazine.

Opioid–down: What did we find?

Table 5 below (and on the following pages) aggregates all active compounds detected in the opioid–down supply in 2024, across all service locations. The number of detections, and the prevalence with respect to all opioid–down samples checked, is listed. Samples with no detected actives have been excluded for brevity, however Table 6 on page 20 aggregates all cutting agents detected in opioid–down samples, across all service locations. See page 10 for definitions of the different composition classes.

Detected Compounds by Composition Class	**Number of Samples** (Percentage of all down samples)
Expected Active Only	***941 (25.8%)***
Fentanyl	936 (25.7%)
Fentanyl and Heroin	2 (< 0.1%)
Fentanyl and Methamphetamine	2 (< 0.1%)
Fentanyl and Cocaine Base (crack, rock, hard)	1 (< 0.1%)
Expected* + Unexpected Active(s)	***1949 (53.5%)***
Fentanyl*	1916 (52.6%)
Heroin*	113 (3.1%)
Acetaminophen (Paracetamol, Tylenol)	1 (<0.1%)
Acetylcodeine	84 (2.3%)
Acetylmorphine (MAM, 6-MAM)	83 (2.3%)
Alprazolam (Xanax)	2 (<0.1%)
Amphetamine	2 (<0.1%)
Benzocaine	1 (<0.1%)
Benzodiazepine (unknown type)	182 (5.0%)
Bromazolam	1059 (29.1%)
Carfentanil	17 (0.5%)
Cocaine Base (crack, rock, hard)	16 (0.4%)
Cocaine HCl (powder)	7 (0.2%)
Desalkylgidazepam	21 (0.6%)
Despropionyl para-fluorofentanyl	14 (0.4%)
Etizolam	13 (0.4%)
Etodesnitazene	1 (<0.1%)
Fentanyl Base	3 (<0.1%)

Table 5 *(Continued on the next page)*. Active compounds detected in opioid–down samples checked in 2024, inclusive of all service locations.

*Instruments may not be able to detect all ingredients and certainty of interpretations may vary. Multiple substances may be present in one sample and substances may be present in trace concentrations. *Expected active component. "Benzodiazepine (unknown type)" results are based on a positive strip test and are unconfirmed by paper spray.*

Opioid–down: What did we find? *(Continued)*

Detected Compounds by Composition Class	**Number of Samples** (Percentage of all down samples)
Expected* + Unexpected Active(s)	***1949 (53.5%)***
Fentanyl analogue (unknown type)	73 (2.0%)
Fentanyl or analogue	29 (0.8%)
Flualprazolam	5 (0.1%)
Flubromazepam	26 (0.7%)
Flubromazolam	2 (<0.1%)
Fluorofentanyl	753 (20.7%)
Fluorofentanyl Base	62 (1.7%)
Furanyl UF-17	1 (<0.1%)
Isobutyryl fentanyl	3 (0.1%)
Isotodesnitazene	2 (<0.1%)
Isotonitazene	9 (0.2%)
Levamisole	1 (<0.1%)
Lidocaine	3 (0.1%)
Meclonazepam	1 (<0.1%)
Medetomidine	12 (0.3%)
Methamphetamine	58 (1.6%)
Metonitazene	2 (<0.1%)
Morphine	13 (0.4%)
N-desethyl isotonitazene	1 (<0.1%)
Phenacetin	8 (0.2%)
Pregabalin	1 (<0.1%)
Procaine	1 (<0.1%)
Sildenafil (Viagra)	1 (<0.1%)
Unknown	16 (0.4%)
Xylazine	156 (4.3%)
ortho-Methyl fentanyl	373 (10.2%)

Table 5 *(Continued from previous page)*. Active compounds detected in opioid–down samples checked in 2024, inclusive of all service locations.

*Instruments may not be able to detect all ingredients and certainty of interpretations may vary. Multiple substances may be present in one sample and substances may be present in trace concentrations. *Expected active component. "Fentanyl or analogue" and "Benzodiazepine (unknown type)" results are based on a positive strip test and are unconfirmed by paper spray.* Fentanyl analogue (unknown type) results occur when reasonable evidence for a fentanyl analogue is present on PS-MS but the specific analogue could not be identified.

Opioid–down: What did we find? *(Continued)*

Detected Compounds by Composition Class	**Number of Samples** (Percentage of all down samples)
Unexpected Active(s) Only	***693 (19.0%)***
2C-B	1 (<0.1%)
Acetaminophen (Paracetamol, Tylenol)	5 (0.1%)
Acetylcodeine	7 (0.2%)
Acetylfentanyl	1 (<0.1%)
Acetylmorphine (MAM, 6-MAM)	9 (0.2%)
Alprazolam (Xanax)	4 (0.1%)
Benzocaine	5 (0.1%)
Benzodiazepine (unknown type)	63 (1.7%)
Bromazolam	195 (5.4%)
Carfentanil	3 (0.1%)
Citalopram	1 (<0.1%)
Cocaine Base (crack, rock, hard)	21 (0.6%)
Cocaine HCl (powder)	4 (0.1%)
Codeine (T3's / T4's)	2 (<0.1%)
Desalkylgidazepam	7 (0.2%)
Despropionyl para-fluorofentanyl	26 (0.7%)
Etizolam	1 (<0.1%)
Fentanyl	89 (2.4%)
Fentanyl Base	18 (0.5%)
Fentanyl analogue (unknown type)	20 (0.5%)
Fentanyl or analogue	33 (0.9%)
Flualprazolam	1 (<0.1%)
Flubromazepam	5 (0.1%)
Flubromazolam	1 (<0.1%)
Fluorofentanyl	292 (8.0%)
Fluorofentanyl Base	90 (2.5%)
Heroin	5 (0.1%)

Table 5 *(Continued from previous page)*. Active compounds detected in opioid–down samples checked in 2024, inclusive of all service locations.

*Instruments may not be able to detect all ingredients and certainty of interpretations may vary. Multiple substances may be present in one sample and substances may be present in trace concentrations. *Expected active component. "Fentanyl or analogue" and "Benzodiazepine (unknown type)" results are based on a positive strip test and are unconfirmed by paper spray.*

Opioid–down: What did we find? *(Continued)*

Detected Compounds by Composition Class	**Number of Samples** (Percentage of all down samples)
Unexpected Active(s) Only	***571 (12.4%)***
Isobutyryl fentanyl	1 (<0.1%)
Isotonitazene	4 (0.1%)
Ketamine	1 (<0.1%)
Lamotrigine	1 (<0.1%)
Levamisole	1 (<0.1%)
MDMA	3 (0.1%)
Medetomidine	7 (0.2%)
Methamphetamine	24 (0.7%)
Metonitazene	4 (0.1%)
Morphine	3 (0.1%)
N-Pyrrolidino Etonitazene	1 (<0.1%)
N-desethyl isotonitazene	1 (<0.1%)
Oxycodone (Oxycontin)	1 (<0.1%)
Phenacetin	14 (0.4%)
Pregabalin	1 (<0.1%)
Protonitazene	2 (<0.1%)
THC	1 (<0.1%)
Tramadol	1 (<0.1%)
Unknown	15 (0.4%)
Xylazine	71 (2.0%)
ortho-Methyl fentanyl	179 (4.9%)
Unknown Composition	4 (0.1%)
Unknown	4 (0.1%)

Table 5 *(Continued from previous page)*. Active compounds detected in opioid–down samples checked in 2024, inclusive of all service locations.

Instruments may not be able to detect all ingredients and certainty of interpretations may vary. Multiple substances may be present in one sample and substances may be present in trace concentrations.

Opioid–down: Cutting Agents

Detected Compounds	**Number of Samples** (% of all down samples)
Caffeine	3212 (88.2%)
Carbohydrate (unknown type)	23 (0.6%)
Dextrose	1 (<0.1%)
Dimethyl sulfone (MSM)	32 (0.9%)
Erythritol (sugar)	1760 (48.3%)
Glutamine	1 (<0.1%)
Inositol (sugar)	5 (0.1%)
Lactose (sugar)	5 (0.1%)
Magnesium sulfate	1 (<0.1%)
Mannitol (sugar)	111 (3.0%)
Microcrystalline cellulose	12 (0.3%)
Mineral (unknown type)	6 (0.2%)
Oil (unknown type)	15 (0.4%)
Polyethylene glycol (PEG)	2 (<0.1%)
Sodium bicarbonate (Baking soda)	3 (0.1%)
Stearic acid	4 (0.1%)
Sucrose (sugar)	17 (0.5%)
Sugar (unknown type)	22 (0.6%)
Water	7 (0.2%)
Xylitol (sugar)	222 (6.1%)

Table 6. Cutting agents detected in opioid–down samples across all service locations. *Quantitative concentrations are not available for these compounds.*

Instruments may not be able to detect all ingredients and certainty of interpretations may vary. Multiple substances may be present in one sample and substances may be present in trace concentrations.

Opioid–down: Quantification

Using PS-MS, we were able to quantify the concentration of select compounds detected in opioid–down samples. Not all samples can be analyzed via PS-MS, primarily due to samples that are too small to be accurately weighed, so the values listed in Table 7 below may not match those listed in Table 5. Table 7 aggregates the results from all *expected* opioid–down samples checked in 2024 across all service locations. Refer to Table 8 on page 23 and 24 for a subset of these data separated by service location. Weight percentage is reported below. "IQR" is the interquartile range: the concentration range containing half of the quantified samples.

Compound	# Quant.	Median	Min	Max	IQR
Fentanyl	2710	14.7%	<0.1%	>80.0%*	6.4% - 25.9%
Bromazolam	1152	5.4%	<0.1%	>50.0%*	1.7% - 10.2%
Fluorofentanyl	981	5.7%	<0.1%	>50.0%*	2.3% - 14.9%
ortho-Methyl fentanyl	489	4.3%	0.3%	77.2%	1.7% - 9.5%
Xylazine	224	0.6%	0.1%	>50.0%*	0.2% - 3.1%
Fluorofentanyl Base	118	15.5%	<0.1%	76.5%	11.1% - 25.1%
Heroin	109	3.7%	0.3%	>80.0%*	1.9% - 20.6%
Acetylmorphine (MAM, 6-MAM)	91	2.5%	0.2%	43.7%	1.0% - 5.3%
Acetylcodeine	91	0.5%	0.1%	15.7%	0.2% - 3.2%
Methamphetamine	65	12.8%	2.0%	>80.0%*	4.7% - 32.5%
Flubromazepam	31	3.8%	0.2%	24.4%	1.6% - 6.2%
Desalkylgidazepam	23	4.3%	0.7%	>50.0%*	2.2% - 16.6%
Carfentanil	20	0.4%	0.1%	1.7%	0.1% - 0.7%
Medetomidine	19	1.0%	0.3%	>50.0%*	0.6% - 1.2%
Phenacetin	17	14.8%	1.8%	66.7%	4.5% - 38.8%
Fentanyl Base	17	19.9%	0.4%	>50.0%*	12.8% - 28.5%
Etizolam	14	1.1%	0.2%	>25.0%*	0.4% - 3.3%
Isotonitazene	13	3.4%	0.8%	14.5%	1.1% - 6.2%
Flualprazolam	6	0.3%	0.1%	0.4%	0.2% - 0.3%
Metonitazene	6	0.5%	0.2%	>25.0%*	0.3% - 5.8%
Alprazolam (Xanax)	6	0.7%	<0.1%	5.3%	0.4% - 4.0%
Flubromazolam	3	0.4%	0.2%	1.5%	
Benzocaine	3	18.8%	3.1%	22.8%	
Lidocaine	3	2.4%	1.4%	2.8%	
N-desethyl isotonitazene	2		0.3%	2.2%	

Table 7 *(Continued on the next page)*. PS-MS quantification of targeted active compounds detected in *expected* opioid–down samples, inclusive of all service locations.

Opioid–down: Quantification *(Continued)*

Compound	# Quant.	Median	Min	Max	IQR
Levamisole	2		0.3%	0.5%	
MDMA	2		16.2%	>50.0%*	
Amphetamine	2		1.1%	1.3%	
Isotodesnitazene	2		1.0%	1.1%	
Pregabalin	2		8.4%	47.1%	
Protonitazene	2		0.2%	>50.0%*	
Tramadol	1		14.5%		
N-Pyrrolidino Etonitazene	1		1.4%		
Procaine	1		10.2%		
Oxycodone (Oxycontin)	1		6.1%		
2C-B	1		>80.0%*		
Etodesnitazene	1		0.4%		
Codeine (T3's / T4's)	1		6.9%		
Furanyl UF-17	1		10.0%		

Table 7 *(Continued from the previous page)*. PS-MS quantification of targeted active compounds detected in *expected* opioid–down samples, inclusive of all service locations.

Opioid–down: Quantification by Service Location

In Table 8 below we expand upon Table 7 to examine the regional variability in the unregulated opioid market, focusing on select actives quantified within *expected opioid–down samples*, aggregated over the full year. Not all samples were analyzed via PS-MS, so the values listed in Table 8 below may not match those listed in Table 5

Service Model	Compound	# Quant.	Median	Min	Max	IQR
Campbell River 174 total down samples 85.1% (148/174) benzo-positive	Bromazolam	81	9.3%	0.2%	43.7%	4.0% - 15.4%
	Carfentanil	12	0.5%	0.1%	1.7%	0.1% - 0.7%
	Fentanyl	84	20.1%	0.1%	61.3%	8.1% - 30.4%
	Fluorofentanyl	40	4.6%	0.3%	36.6%	2.8% - 12.5%
	Xylazine	16	1.6%	0.2%	28.4%	0.5% - 6.5%
	ortho-Methyl fentanyl	16	7.6%	0.6%	74.2%	5.3% - 23.4%
Comox Valley 105 total down samples 90.5% (95/105) benzo-positive	Bromazolam	56	13.6%	0.1%	44.0%	4.5% - 22.1%
	Carfentanil	1		0.7%		
	Fentanyl	64	15.1%	0.2%	59.6%	5.6% - 28.0%
	Fluorofentanyl	28	4.4%	0.2%	32.4%	1.2% - 19.6%
	Xylazine	22	5.2%	0.1%	40.2%	0.5% - 27.4%
Duncan 199 total down samples 73.9% (147/199) benzo-positive	Bromazolam	100	5.4%	0.2%	35.6%	1.7% - 8.5%
	Fentanyl	102	9.6%	0.2%	57.9%	2.8% - 22.6%
	Fluorofentanyl	50	5.4%	0.4%	38.4%	1.8% - 10.9%
	Xylazine	18	0.8%	0.1%	13.8%	0.5% - 1.1%
	ortho-Methyl fentanyl	47	8.6%	0.5%	31.1%	1.9% - 15.4%
Port Alberni 103 total down samples 69.9% (72/103) benzo-positive	Bromazolam	43	5.7%	0.4%	61.2%	2.1% - 11.8%
	Fentanyl	61	11.0%	0.7%	73.3%	6.2% - 24.4%
	Fluorofentanyl	15	2.9%	0.7%	46.2%	1.9% - 8.2%
	Xylazine	1		32.7%		
	ortho-Methyl fentanyl	1		2.9%		
Port Hardy 0 total down samples	No Opioid-Down samples were checked in Port Hardy during 2024					

Table 8 *(Continued on the next page)*. PS-MS quantification of select active compounds detected in *expected* opioid–down samples per service locations.

Opioid–down: Quantification by Service Location *(Continued)*

Service Model	Compound	# Quant.	Median	Min	Max	IQR
Substance 2528 total down samples 35.3% (892/2528) benzo-positive	Bromazolam	674	4.7%	0.1%	69.0%	1.6% - 8.3%
	Carfentanil	5	0.1%	0.1%	0.2%	0.1% - 0.1%
	Fentanyl	1907	14.0%	<0.1%	>80.0%*	6.3% - 24.1%
	Fluorofentanyl	687	5.4%	0.2%	78.6%	2.3% - 13.5%
	Xylazine	135	0.4%	0.1%	43.9%	0.1% - 1.3%
	ortho-Methyl fentanyl	326	3.9%	0.3%	>80.0%*	1.6% - 7.7%
Outreach 532 total down samples 32.9% (175/532) benzo-positive	Bromazolam	135	6.6%	0.2%	37.7%	2.3% - 12.3%
	Carfentanil	2		0.6%	0.9%	
	Fentanyl	361	13.4%	0.1%	>80.0%*	6.3% - 21.6%
	Fluorofentanyl	126	5.6%	0.2%	>80.0%*	2.2% - 18.0%
	Xylazine	30	1.2%	0.1%	9.7%	0.3% - 5.4%
	ortho-Methyl fentanyl	93	4.6%	0.5%	>80.0%*	1.7% - 9.8%

Table 8 *(Continued from the previous page)*. PS-MS quantification of select active compounds detected in *expected* opioid–down samples per service locations.

Opioid–down: Quantification by Time

Here we examine the variability of the concentration of fentanyl, fluorofentanyl, ortho-methyl Fentanyl, xylazine, and bromazolam as a function of time in 2024. Not only does the median concentration of these compounds fluctuate throughout the year, but the volatility, shown here by the *interquartile range*, the concentration range that contains half of the quantified samples, also remains high every month. We assert that this "consistently inconsistent" nature of the opioid–down supply, i.e. the persistently high variability in composition and concentration, is a greater risk to people who use opioids than the compounds themselves. Data shown here and on the following pages are inclusive of all service locations.

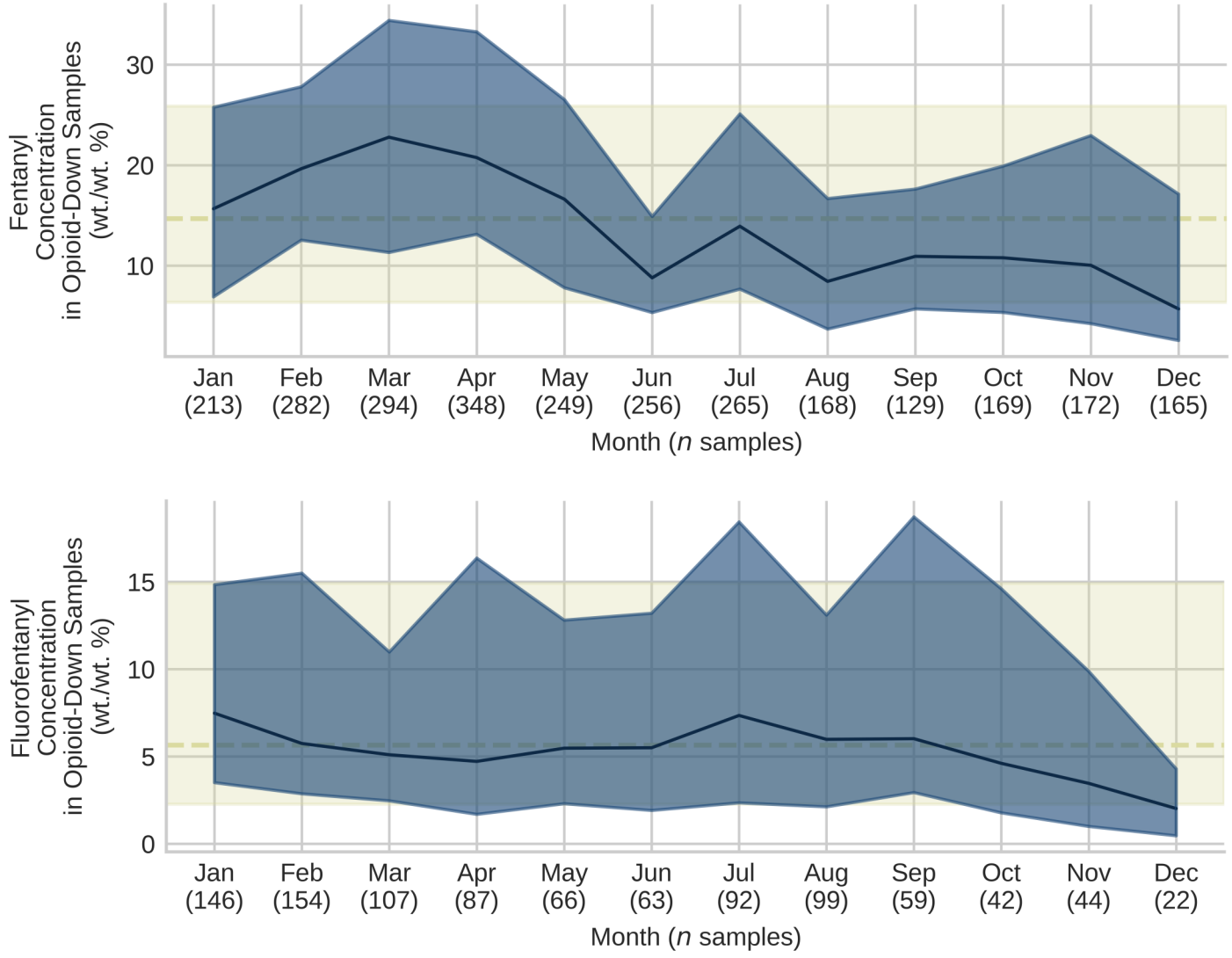


Figure 9. Monthly variability of the concentration of fentanyl (top) and fluorofentanyl (bottom) quantified in opioid–down samples checked in 2024 across all service locations. The number of samples quantified each month is shown in parentheses. The solid line represents the median concentration each month, while the dark shaded region bounds the monthly interquartile range. The dashed line in the background of each panel displays the annual median concentration and the light shaded region bounds the annual interquartile range. Weight/weight percentage is shown, as determined via PS-MS.

Opioid–down: Quantification by Time *(Continued)*

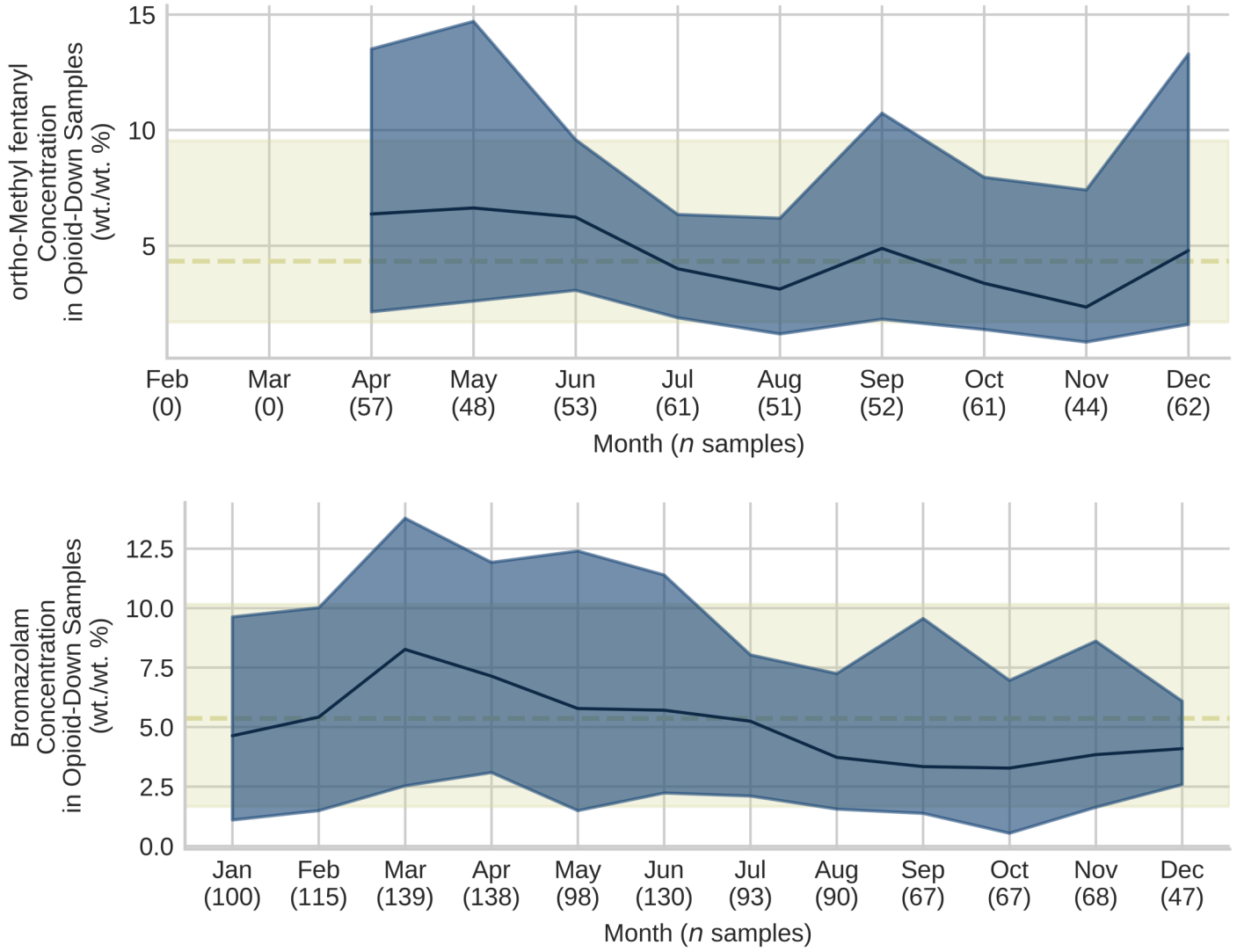


Figure 10. Monthly variability of the concentration of ortho-Methyl fentanyl (top) and bromazolam (bottom) quantified in opioid–down samples checked in 2024 across all service locations. The number of samples quantified each month is shown in parentheses. The solid line represents the median concentration each month, while the dark shaded region bounds the monthly interquartile range. The dashed line in the background of each panel displays the annual median concentration and the light shaded region bounds the annual interquartile range. Weight / weight percentage is shown, as determined via PS-MS.

Opioid–down: Quantification by Time *(Continued)*

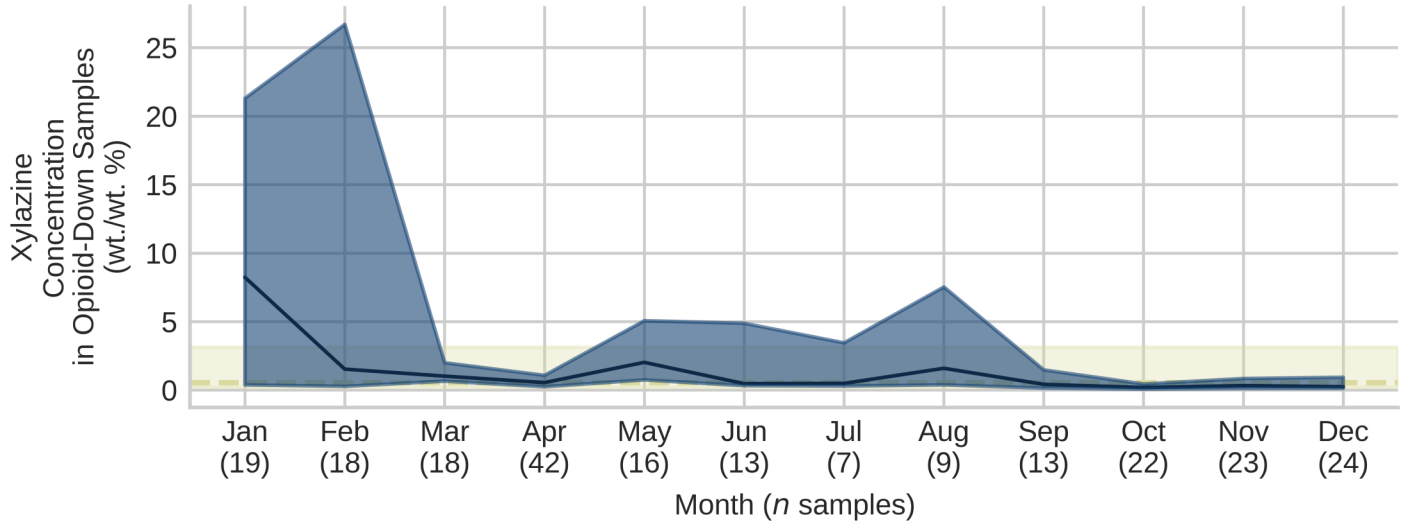


Figure 11. Monthly variability of the concentration of xylazine quantified in opioid–down samples checked in 2024 across all service locations. The number of samples quantified each month is shown in parentheses. The solid line represents the median concentration each month, while the dark shaded region bounds the monthly interquartile range. The dashed line in the background of each panel displays the annual median concentration and the light shaded region bounds the annual interquartile range. Weight / weight percentage is shown, as determined via PS-MS.

Cocaine

"Cocaine" includes samples that are expected to be cocaine HCl (soft/powder) and cocaine base (hard/rock/crack). We receive many questions regarding the purity cocaine and what we mean when a sample was *"found to be cocaine with no cuts or adulterants detected." "No cuts detected"* certainly does not mean "pure" and should not be interpreted as such. Please refer to our Limitations on page 10 and 11 for a more detailed discussion around purity analysis. Despite our inability to comment on purity, we check every sample for the most common active cuts found in cocaine: benzocaine, levamisole, and phenacetin, with quantification possible down to approximately 0.1% by weight using PS-MS. Table 11 on page 31 aggregates the quantitative data for select actives detected within cocaine samples across all service locations and a summary of the inactive cuts found in cocaine can be found on page 30 and 31 in Table 10.

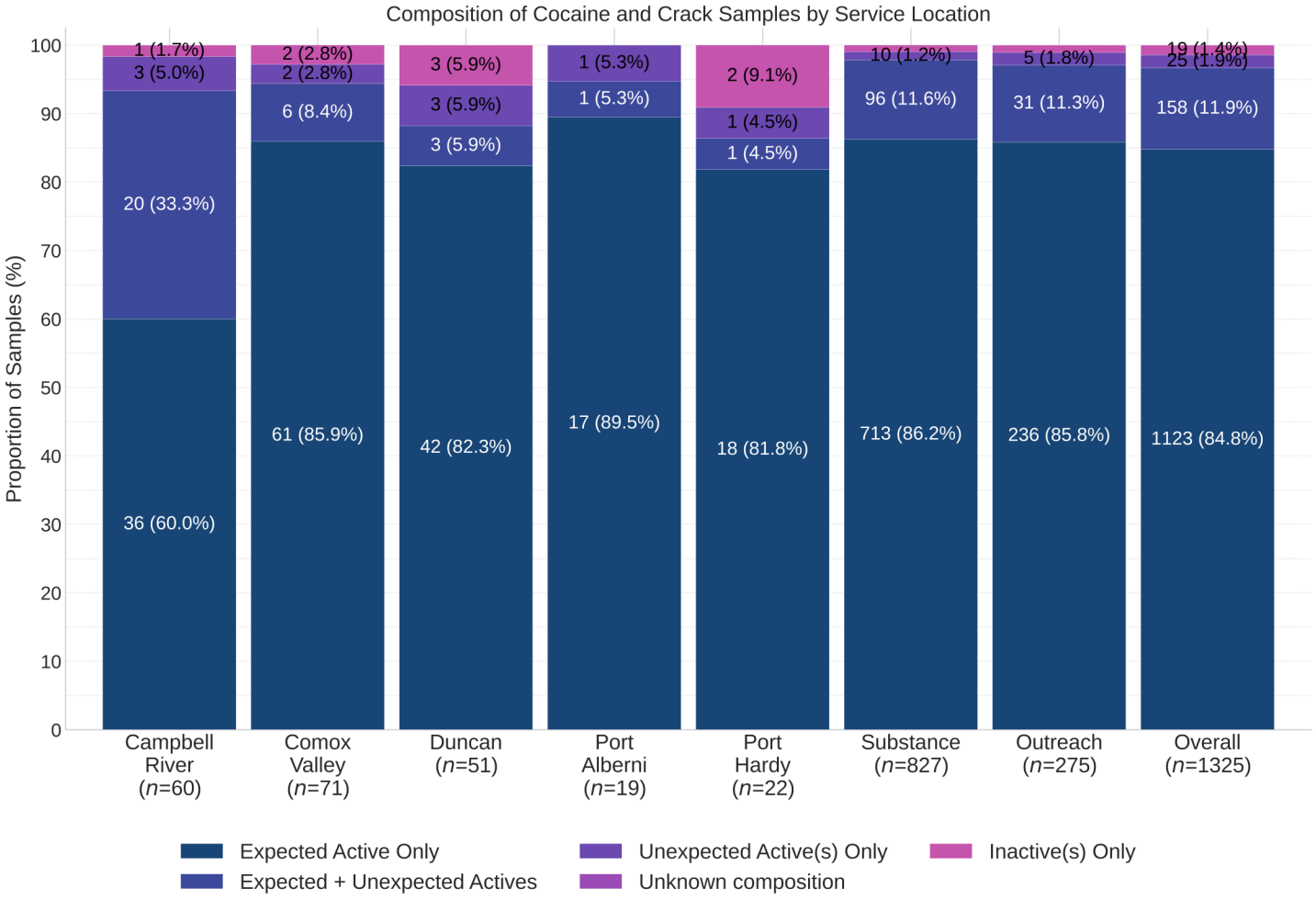


Figure 12. Proportion and number of cocaine samples checked by service locations, grouped by composition class (see page 10 for definitions). Proportions less than or equal to 1.1% are omitted for readability.

Cocaine: What did we find?

Table 9 below (and on the following page) aggregates all active compounds detected in cocaine samples in 2023, across all service locations. The number of detections, and the prevalence with respect to all cocaine samples checked, is listed. Samples with no detected actives have been excluded for brevity, however Table 10 on page 30 aggregates all cutting agents detected in cocaine samples, across all service locations. See page 10 for definitions of the different composition classes.

Detected Compounds by Composition Class	**Number of Samples** (% of all cocaine samples)
Expected Active Only	**1123 (84.8%)**
Cocaine Base (crack, rock, hard)	269 (20.3%)
Cocaine HCl (powder)	862 (65.1%)
Cocaine HCl (powder) and Benzocaine	1 (<0.1%)
Expected* + Unexpected Active(s)	**158 (11.9%)**
Cocaine Base (crack, rock, hard)*	73 (5.5%)
Cocaine HCl (powder)*	85 (6.4%)
Benzocaine	4 (0.3%)
Benzodiazepine (unknown type)	4 (0.3%)
Ecgonine	1 (0.1%)
Fentanyl	10 (0.8%)
Fentanyl analogue (unknown type)	2 (0.2%)
Fentanyl or analogue	15 (1.1%)
Ketamine	3 (0.2%)
Ketamine Base	1 (0.1%)
Levamisole	70 (5.3%)
Lidocaine	4 (0.3%)
MDMA	1 (0.1%)
Methamphetamine	4 (0.3%)
Phenacetin	36 (2.7%)
Procaine	7 (0.5%)
Unknown	6 (0.5%)
Zolpidem (Ambien)	1 (0.1%)
ortho-Methyl fentanyl	1 (0.1%)

Table 9 *(Continued on the next page)*. Active compounds detected in cocaine samples checked in 2024, inclusive of all service locations.

*Instruments may not be able to detect all ingredients and certainty of interpretations may vary. Multiple substances may be present in one sample and substances may be present in trace concentrations. *Expected active component. "Fentanyl or analogue" and "Benzodiazepine (unknown type)" results are based on a positive strip test and are unconfirmed by paper spray.*

Cocaine: What did we find? *(Continued)*

Detected Compounds by Composition Class	**Number of Samples** (% of all cocaine samples)
Unexpected Active(s) Only	**25 (1.9%)**
Acetaminophen (Paracetamol, Tylenol)	1 (<0.1%)
Benzodiazepine (unknown type)	1 (<0.1%)
Bromazolam	2 (0.2%)
Cocaine HCl (powder)	2 (0.2%)
Fentanyl	7 (0.5%)
Fentanyl or analogue	1 (<0.1%)
Fluorofentanyl	2 (0.2%)
Fluorofentanyl Base	1 (<0.1%)
Fluoxymesterone	1 (<0.1%)
Ketamine	3 (0.2%)
MDMA	1 (<0.1%)
Metformin HCl	1 (<0.1%)
Methamphetamine	2 (0.2%)
Methandrostenolone	1 (<0.1%)
Phenacetin	2 (0.2%)
Procaine	1 (<0.1%)
Unknown	1 (<0.1%)
Xylazine	1 (<0.1%)
ortho-Methyl fentanyl	4 (0.3%)

Table 9 (*Continued from previous page*). Active compounds detected in cocaine samples checked in 2023, inclusive of all service locations

Instruments may not be able to detect all ingredients and certainty of interpretations may vary. Multiple substances may be present in one sample and substances may be present in trace concentrations.

Cocaine: Cutting Agents

Compound	**Number of Samples** (% of all Cocaine samples)
Ascorbic acid (Vitamin C)	1 (0.1%)
Caffeine	25 (1.9%)
Carbohydrate (unknown type)	3 (0.2%)
Erythritol (sugar)	9 (0.7%)

Table 10 *(Continued on the next page)*. Cutting agents detected in cocaine samples across all service locations. *Quantitative concentrations are not available for these compounds.*

Cocaine: Cutting Agents *(Continued)*

Compound	Number of Samples (% of all cocaine samples)
Glutamine	2 (0.2%)
Inositol (sugar)	5 (0.4%)
Lactose (sugar)	1 (0.1%)
Mineral (unknown type)	3 (0.2%)
Oil (unknown type)	4 (0.3%)
Sodium bicarbonate (Baking soda)	4 (0.3%)
Sucrose (sugar)	1 (0.1%)
Sugar (unknown type)	2 (0.2%)
Water	8 (0.6%)
Xylitol (sugar)	1 (0.1%)

Table 10 *(Continued from the previous page)*. Cutting agents detected in cocaine samples across all service locations. *Quantitative concentrations are not available for these compounds.*

Cocaine: Quantification

Using PS-MS, we were able to quantify the concentration of select compounds detected in cocaine samples. Not all samples can be analyzed via PS-MS, primarily due to samples that are too small to be accurately weighed, so the values listed in Table 11 below may not match those listed in Table 9. Table 11 aggregates the results from all *expected* cocaine samples checked in 2023 across all service locations. Weight percentage is reported below. "IQR" is the interquartile range: the concentration range containing half of the quantified samples.

Compound	# Quant.	Median	Min	Max	IQR
Levamisole	64	2.3%	0.1%	>50.0%*	0.4% - 4.5%
Phenacetin	20	18.4%	2.8%	66.7%	6.2% - 34.5%
Fentanyl	17	10.5%	<0.1%	51.7%	0.4% - 35.0%
Procaine	7	1.3%	0.2%	1.9%	0.5% - 1.5%
Lidocaine	4	2.1%	0.4%	4.2%	1.6% - 2.8%
Benzocaine	4	14.0%	2.9%	21.8%	6.8% - 20.4%
ortho-Methyl fentanyl	4	1.6%	0.8%	3.9%	1.3% - 2.2%
Ketamine	3	>50.0%*	6.2%	>80.0%*	
Bromazolam	2		20.4%	25.0%	
MDMA	2		7.6%	>50.0%*	
Methamphetamine	2		4.4%	>50.0%*	

Table 11 *(Continued on the next page)*. PS-MS quantification of targeted active compounds detected in *expected* cocaine samples, inclusive of all service locations.

Cocaine: Quantification *(Continued)*

Compound	# Quant.	Median	Min	Max	IQR
Fluorofentanyl	2		5.6%	11.6%	
Fluorofentanyl Base	1		8.9%		
Ecgonine	1		1.6%		
Xylazine	1		16.5%		
Zolpidem (Ambien)	1		0.2%		

Table 11 *(Continued on from previous page)*. PS-MS quantification of targeted active compounds detected in *expected* cocaine samples, inclusive of all service locations.

MDMA

"MDMA" groups samples that are expected to be either MDMA or MDA. In 2024, 88.4% of expected MDMA/MDA samples were confirmed to be MDMA/MDA with no other active compounds detected. 61 samples (5.8% of all expected MDMA/MDA samples) came in the form of pressed pills, and inactive cutting agents were found in an additional 75 samples (7.1% of all expected MDMA/MDA). Similar to the story with cocaine, *"no cuts detected"* certainly does not mean these samples were pure, but instead these samples likely contain impurities below the limits of detection for FTIR and/or compounds outside of our targeted method for PS-MS. The MDMA-MDA mix-up represents 52.5% (21/40) of samples that had an unexpected composition, with 8 expected MDMA samples instead containing MDA and 13 expected MDA samples instead containing MDMA. This also occurred with samples that had a unexpected additional composition (expected + unexpected actives in Figure 13), with 51.5% (34/66) of unexpected additional samples including a combination of MDMA and MDA. Lastly are the samples which did not contain an active, which make up 1.5% of the overall samples within the MDMA category.

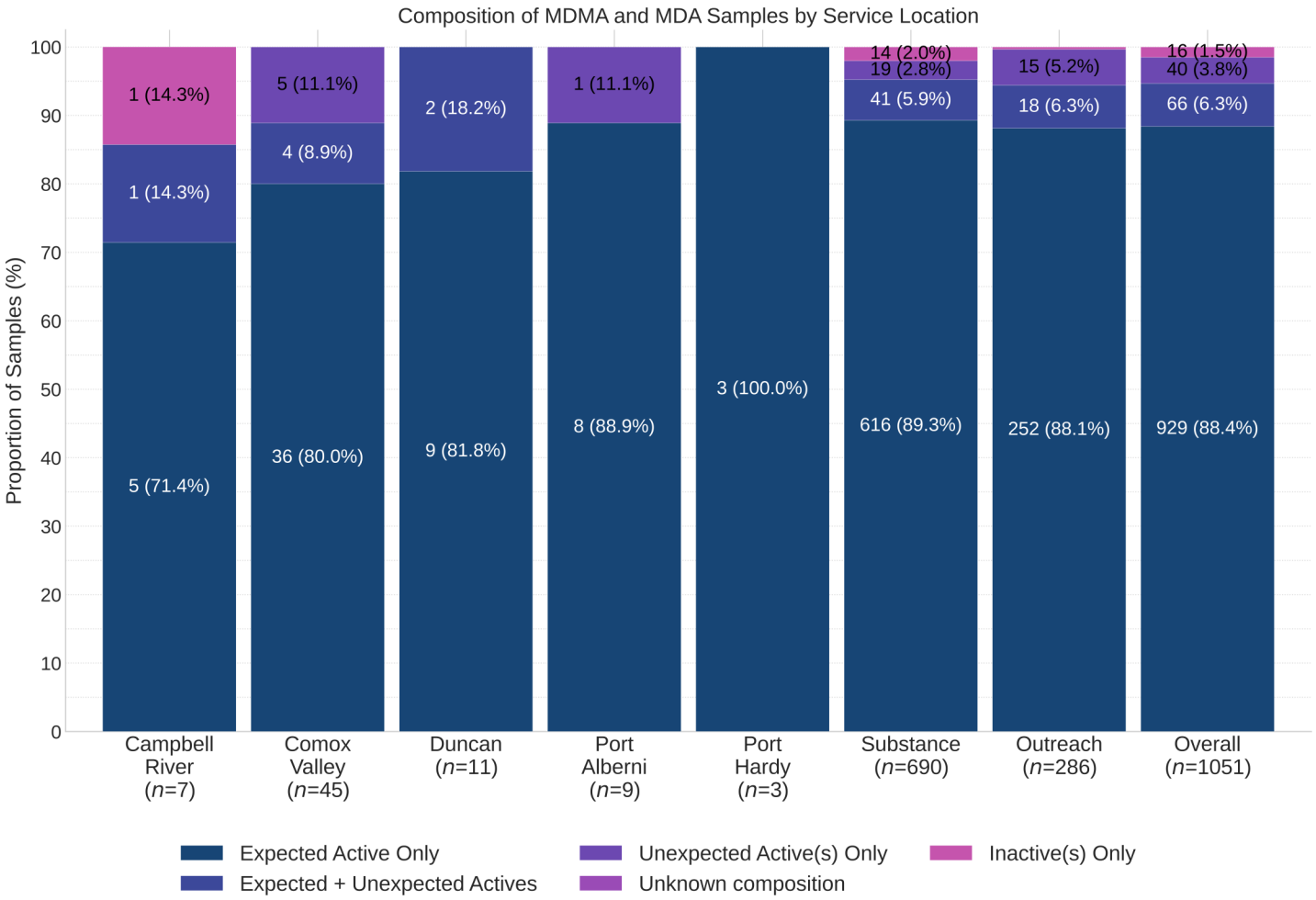


Figure 13. Proportion and number of MDMA samples checked by service locations, grouped by composition class (see page 10 for definitions). Proportions less than or equal to 1.1% are omitted for readability.

MDMA: What did we find?

Table 12 below (and on the following page) aggregates all active compounds detected in MDMA/MDA samples in 2023, across all service locations. The number of detections, and the prevalence with respect to all MDMA/MDA samples checked, is listed. Samples with no detected actives have been excluded for brevity, however Table 13 on page 35 and 36 aggregates all cutting agents detected in MDMA, across all service locations. See page 10 for definitions of the different composition classes.

Detected Compounds by Composition Class	**Number of Samples** (% of all MDMA samples)
Expected Active Only	**929 (88.4%)**
MDMA	868 (82.6%)
MDA	35 (3.3%)
MDMA + MDA	24 (2.3%)
Ketamine + MDMA	1 (< 0.1%)
MDMA + MDA + Meth	1 (< 0.1%)
Expected* + Unexpected Active(s)	**66 (6.3%)**
MDMA*	65 (6.2%)
MDA*	35 (3.3%)
2C-B	1 (0.1%)
Bromazolam	1 (0.1%)
Cocaine HCl (powder)	4 (0.4%)
Fentanyl or analogue	1 (0.1%)
Ketamine	5 (0.5%)
MDEA	4 (0.4%)
Methamphetamine	14 (1.3%)
Unknown	6 (0.6%)
Unexpected Active(s) Only	**40 (3.8%)**
3,4-MDMA methylene homolog HCl	1 (0.1%)
Acetaminophen (Paracetamol, Tylenol)	1 (0.1%)
Benzodiazepine (unknown type)	1 (0.1%)
Bromazolam	1 (0.1%)
Cocaine HCl (powder)	1 (0.1%)

Table 12 *(Continued on the next page)*. Active compounds detected in MDMA samples checked in 2023, inclusive of all service locations.

*Instruments may not be able to detect all ingredients and certainty of interpretations may vary. Multiple substances may be present in one sample and substances may be present in trace concentrations. *Expected active component. "Fentanyl or analogue" results are based on a positive strip test and are unconfirmed by paper spray.*

MDMA: What did we find? *(Continued)*

Detected Compounds by Composition Class	**Number of Samples** (% of all MDMA samples)
Unexpected Active(s) Only	**40 (3.8%)**
Fentanyl	1 (0.1%)
Fentanyl or analogue	1 (0.1%)
Fluorofentanyl	2 (0.2%)
Ketamine	7 (0.7%)
MDA	8 (0.8%)
MDEA	1 (0.1%)
MDMA	14 (1.3%)
Melatonin	1 (0.1%)
Methamphetamine	3 (0.3%)
Sildenafil (Viagra)	1 (0.1%)
Tadalafil (Cialis)	1 (0.1%)
Unknown	1 (0.1%)
para-Methoxyphenylpiperazine (pMeOPP)	1 (0.1%)

Table 12 *(Continued from previous page)*. Active compounds detected in MDMA/MDA samples checked in 2023, inclusive of all service locations.

MDMA: Cutting Agents

Compound	**Number of Samples** (% of all MDMA samples)
Caffeine	24 (2.3%)
Carbohydrate (unknown type)	11 (1.0%)
Dicalcium phosphate	4 (0.4%)
Dimethyl sulfone (MSM)	3 (0.3%)
Erythritol (sugar)	4 (0.4%)
Fatty acid (unknown type)	1 (0.1%)
Flour	1 (0.1%)
Fructose (sugar)	1 (0.1%)
Inositol (sugar)	2 (0.2%)
Lactose (sugar)	2 (0.2%)

Table 13 *(Continued on the next page)*. Cutting agents detected in MDMA/MDA samples across all service locations. *Quantitative concentrations are not available for these compounds.*

Instruments may not be able to detect all ingredients and certainty of interpretations may vary. Multiple substances may be present in one sample and substances may be present in trace concentrations.

MDMA: Cutting Agents *(Continued)*

Compound	**Number of Samples** (% of all MDMA samples)
Mannitol (sugar)	3 (0.3%)
Microcrystalline cellulose	87 (8.3%)
Mineral (unknown type)	10 (1.0%)
Oil (unknown type)	10 (1.0%)
Starch	2 (0.2%)
Stearic acid	18 (1.7%)
Sucrose (sugar)	8 (0.8%)
Sugar (unknown type)	8 (0.8%)
Water	3 (0.3%)
Xylitol (sugar)	1 (0.1%)

Table 13 *(Continued from the previous page)*. Cutting agents detected in MDMA/MDA samples across all service locations. *Quantitative concentrations are not available for these compounds.*

MDMA: Quantification

Using PS-MS, we were able to quantify the concentration of select compounds detected in MDMA samples. Not all samples can be analyzed via PS-MS, primarily due to samples that are too small to be accurately weighed, so the values listed in Table 14 below may not match those listed in Table 12. Table 14 aggregates the results from all *expected* MDMA samples checked in 2023 across all service locations. Weight percentage is reported below. "IQR" is the interquartile range: the concentration range containing half of the quantified samples.

Compound	# Quant.	Median	Min	Max	IQR
Methamphetamine	8	8.0%	< 0.1%	> 50.0%*	6.3% - 24.9%
MDEA	5	0.9%	0.5%	4.0%	0.5% - 1.6%
Ketamine	4	> 50.0%*	24.8%	> 80.0%*	43.7% - 57.5%
Cocaine HCl (powder)	3	1.6%	1.5%	1.6%	
Fluorofentanyl	2		4.0%	27.3%	
2C-B	1		1.2%		
Bromazolam	1		0.2%		

Table 14. PS-MS quantification of targeted active compounds detected in *expected* cocaine samples, inclusive of all service locations.

Methamphetamine

83.5% (258/309) of the methamphetamine samples checked in 2024 were confirmed to contain methamphetamine with no other active compounds detected. Cutting agents were found in 11.0% (34/309) of methamphetamine samples. Caffeine, the most common cut found in methamphetamine, was detected 3.9% (12/309) of samples and Dimethyl sulfone (MSM) was found in 3.2% (10/309) samples. Despite a majority of meth being "as expected" from a chemical lens, many service users still report unexpected or adverse effects from samples that were found to be "*meth with no cuts or adulterants detected*". We suspect this can be attributed to the purity of the meth, the relative ratios of the *d*- and *l*- isomers of meth in any given sample, and the set and setting in which the drug was consumed. Unfortunately we are unable to address these first two speculations given the limitations of our instrumentation, but fortunately practices around safer meth use can help minimize the possible harms introduced through set and setting. Starting "low and slow", using clean supplies, staying hydrated, staying cool, eating food, getting some sleep, and (when possible) consuming in safer places with people you trust are some recipes for success.

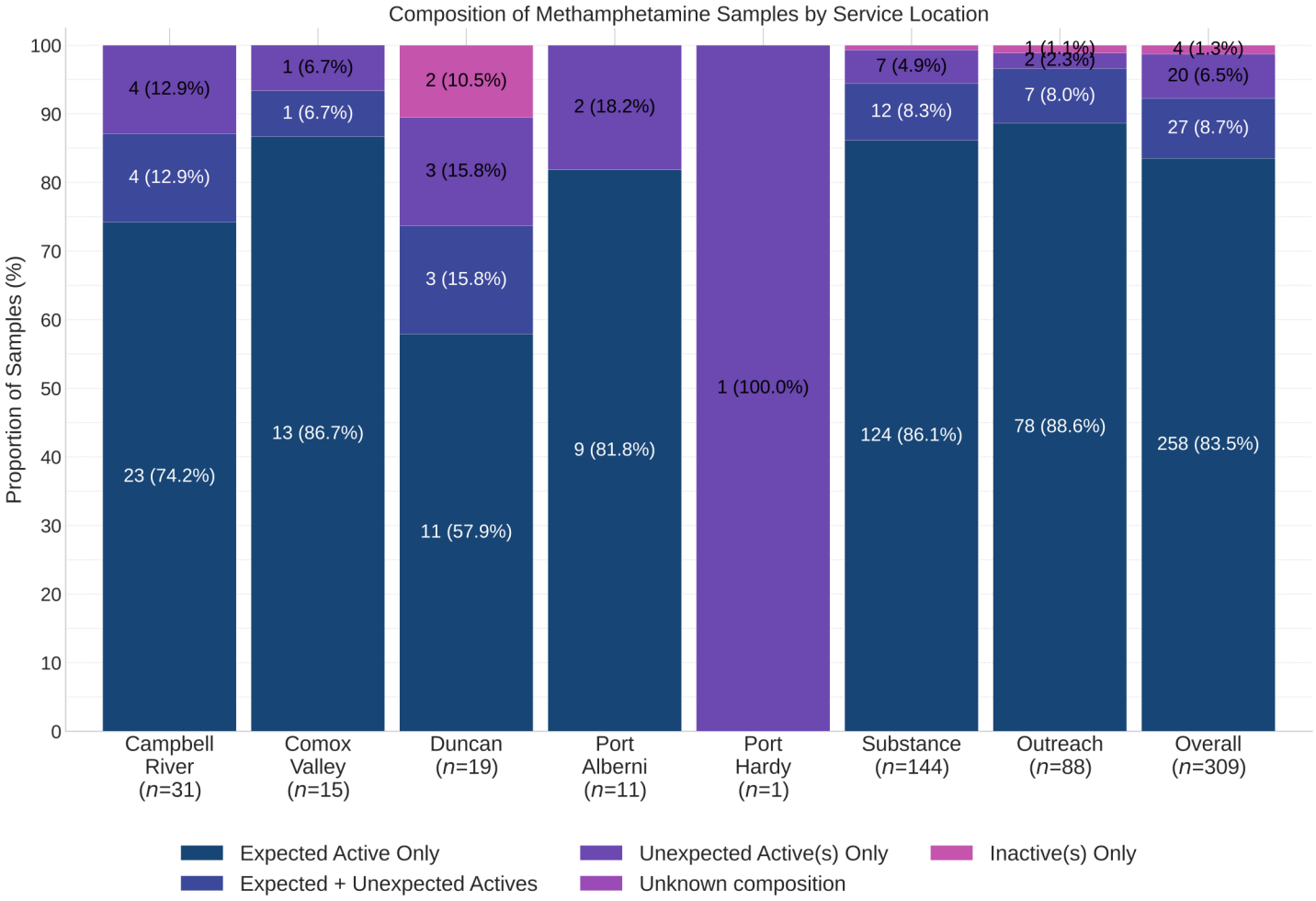


Figure 14. Proportion and number of methamphetamine samples checked by service locations, grouped by composition class (see page 10 for definitions). Proportions less than or equal to 1.1% are omitted for readability.

Methamphetamine: What did we find?

Table 15 below aggregates all active compounds detected in methamphetamine samples in 2023, across all service locations. The number of detections, and the prevalence with respect to all methamphetamine samples checked, is listed. Samples with no detected actives have been excluded for brevity, however Table 16 aggregates all cutting agents detected in meth, across all service locations. See page 10 for definitions of the different composition classes.

Detected Compounds by Composition Class	**Number of Samples** (% of all meth samples)
Expected Active Only	**258 (83.5%)**
Methamphetamine	258 (83.5%)
Expected* + Unexpected Active(s)	**27 (8.7%)**
Methamphetamine*	27 (8.7%)
Amphetamine	3 (1.0%)
Benzodiazepine (unknown type)	3 (1.0%)
Bromazolam	4 (1.3%)
Cocaine Base (crack, rock, hard)	2 (0.6%)
Fentanyl	10 (3.2%)
Fentanyl or analogue	6 (1.9%)
Fluorofentanyl	4 (1.3%)
Fluorofentanyl Base	1 (0.3%)
Phenacetin	1 (0.3%)
Unknown	1 (0.3%)
Unexpected Active(s) Only	**20 (6.5%)**
Benzodiazepine (unknown type)	1 (0.3%)
Bromazolam	2 (0.6%)
Cocaine Base (crack, rock, hard)	7 (2.3%)
Cocaine HCl (powder)	3 (1.0%)
Fentanyl	4 (1.3%)
Fentanyl or analogue	1 (0.3%)
Ketamine	1 (0.3%)
MDMA	3 (1.0%)
Phenacetin	1 (0.3%)

Table 15. Active compounds detected in methamphetamine samples checked in 2024, inclusive of all service locations.

*Instruments may not be able to detect all ingredients and certainty of interpretations may vary. Multiple substances may be present in one sample and substances may be present in trace concentrations. *Expected active component. "Fentanyl or analogue" and "Benzodiazepine (unknown type)" results are based on a positive strip test and are unconfirmed by paper spray.*

Methamphetamine: Cutting Agents

Compound	**Number of Samples** (% of all meth samples)
Aluminum Potassium Sulphate	1 (0.3%)
Caffeine	12 (3.9%)
Dimethyl sulfone (MSM)	10 (3.2%)
Erythritol (sugar)	3 (1.0%)
Magnesium sulfate	1 (0.3%)
Microcrystalline cellulose	7 (2.3%)
Salt	1 (0.3%)
Sucrose (sugar)	3 (1.0%)

Table 16. Cutting agents detected in methamphetamine samples across all service locations. *Quantitative concentrations are not available for these compounds.*

Methamphetamine: Quantification

Using PS-MS, we were able to quantify the concentration of select compounds detected in methamphetamine samples. Not all samples can be analyzed via PS-MS, primarily due to samples that are too small to be accurately weighed, so the values listed in Table 17 below may not match those listed in Table 15. Table 17 aggregates the results from all *expected* meth samples checked in 2024 across all service locations. Weight percentage is reported below. "IQR" is the interquartile range: the concentration range containing half of the quantified samples.

Compound	# Quant.	Median	Min	Max	IQR
Fentanyl	14	0.4%	<0.1%	>50.0%*	0.3% - 4.3%
Bromazolam	5	0.9%	0.4%	6.8%	0.9% - 4.4%
Fluorofentanyl	4	0.5%	0.3%	1.0%	0.3% - 0.9%
Amphetamine	3	3.4%	2.3%	3.7%	
Phenacetin	2		1.2%	>50.0%*	
Ketamine	1		>80.0%*		
Fluorofentanyl Base	1		34.4		
Cocaine Base (crack, rock, hard)	1		>50.0%*		

Table 17. PS-MS quantification of targeted active compounds detected in *expected* methamphetamine samples, inclusive of all service locations.

Dissociatives

The dissociative class is largely represented by ketamine, with expected ketamine samples making up 96.8% (602/622) of the dissociative samples checked in 2024. We occasionally see novel dissociatives such as O-PCE and Fluorexetamine. The dissociative class shows the lowest levels of adulteration or misrepresentation out of all of the drug classes that we check: 91.5% (569/622) of dissociative samples checked in 2024 were "as expected" and cutting agents were detected in only 4.8% (30/622) of expected dissociative samples. Despite the apparent "quality" of the dissociatives, we still caution service users that "no cuts detected" does not reflect compound purity, that we cannot differentiate the *r*- and *s*-ketamine isomers with our current methods, and that cuts or adulterants may still be present in these samples below the limits of detection of our instruments.

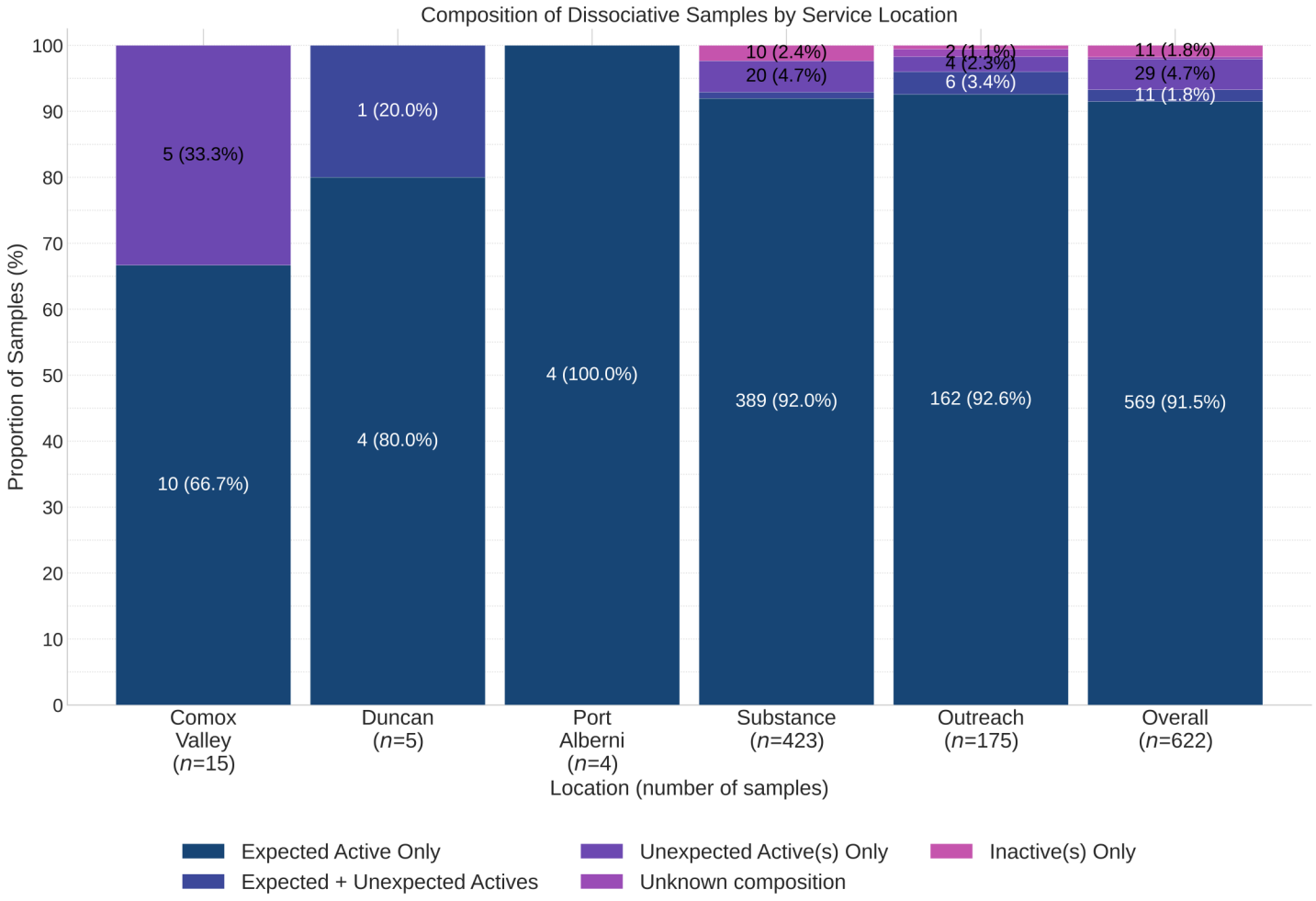


Figure 15. Proportion and number of dissociative samples checked by service locations, grouped by composition class (see page 10 for definitions). Proportions less than or equal to 1.1% are omitted for readability.

Dissociatives: What did we find?

Table 19 below aggregates all active compounds detected in dissociative samples in 2024, across all service locations. The number of detections, and the prevalence with respect to all dissociative samples checked, is listed. Samples with no detected actives have been excluded for brevity, however Table 19 on page 42 aggregates all cutting agents detected in dissociative samples across all service locations. See page 10 for definitions of the different composition classes.

Detected Compounds by Composition Class	**Number of Samples** (% of all dissociative samples)
Expected Active Only	**569 (91.5%)**
Ketamine	551 (88.6%)
2-fluoro-2-oxo-PCE (2F-NENDCK, CanKet)	1 (0.2%)
3-Fluoro-PCP	1 (0.2%)
3-HO-PCE	1 (0.2%)
3-MeO-PCP	4 (0.6%)
Deschloroketamine (DXE, DCK, 2-O-PCM)	1 (0.2%)
Fluorexetamine (FXE)	1 (0.2%)
O-PCE (Deschloro-N-ethyl-ketamine)	8 (1.3%)
Phencyclidine (PCP)	1 (0.2%)
Expected* + Unexpected Active(s)	**11 (1.8%)**
Ketamine*	11 (1.8%)
Benzocaine	2 (0.3%)
Cocaine HCl (powder)	2 (0.3%)
Ketamine Base	2 (0.3%)
MDMA	3 (0.5%)
Phenacetin	1 (0.2%)
Unknown	2 (0.3%)
Unexpected Active(s) Only	**29 (4.7%)**
2-fluoro-2-oxo-PCE (2F-NENDCK, CanKet)	4 (0.6%)
Acetylcodeine	1 (0.2%)
Acetylmorphine (MAM, 6-MAM)	1 (0.2%)
Cocaine Base (crack, rock, hard)	2 (0.3%)
Cocaine HCl (powder)	2 (0.3%)
Fentanyl or analogue	1 (0.2%)

Table 18 *(Continued on the next page)*. Active compounds detected in dissociative samples checked in 2024, inclusive of all service locations.

*Instruments may not be able to detect all ingredients and certainty of interpretations may vary. Multiple substances may be present in one sample and substances may be present in trace concentrations. *Expected active component.*

Dissociatives: What did we find? *(Continued)*

Detected Compounds by Composition Class	**Number of Samples** (% of all dissociative samples)
Unexpected Active(s) Only	**29 (4.7%)**
Fluorofentanyl Base	3 (0.5%)
Heroin	1 (0.2%)
Ketamine	3 (0.5%)
Levamisole	1 (0.2%)
MDA	13 (2.1%)
MDMA	3 (0.5%)
Phenacetin	2 (0.3%)
Unknown	1 (0.2%)
Unknown Composition	**2 (0.3%)**
Unknown	2 (0.3%)

Table 18 *(Continued from the previous page)*. Active compounds detected in dissociative samples checked in 2024, inclusive of all service locations.

Dissociatives: Cutting Agents

Compound	**Number of Samples** (% of all dissociative samples)
Caffeine	3 (0.5%)
Dimethyl sulfone (MSM)	6 (1.0%)
Monosodium glutamate (MSG)	4 (0.6%)
Oil (unknown type)	1 (0.2%)
Sodium bicarbonate (Baking soda)	1 (0.2%)
Sucrose (sugar)	3 (0.5%)
Sugar (unknown type)	1 (0.2%)
Taurine	1 (0.2%)
Water	10 (1.6%)

Table 19. Cutting agents detected in dissociative samples across all service locations. *Quantitative concentrations are not available for these compounds.*

*Instruments may not be able to detect all ingredients and certainty of interpretations may vary. Multiple substances may be present in one sample and substances may be present in trace concentrations. *Expected active component. "Fentanyl or analogue" and "Benzodiazepine (unknown type)" results are based on a positive strip test and are unconfirmed by paper spray.*

Dissociatives: Quantification

Using PS-MS, we were able to quantify the concentration of select compounds detected in dissociative samples. Not all samples can be analyzed via PS-MS, primarily due to samples that are too small to be accurately weighed, so the values listed in Table 20 below may not match those listed in Table 18. Table 20 aggregates the results from all *expected* dissociative samples checked in 2024 across all service locations. Weight percentage is reported below. "IQR" is the interquartile range: the concentration range containing half of the quantified samples.

Compound	# Quant.	Median	Min	Max	IQR
Ketamine	248	> 50.0%*	1.5%	>80.0%*	50.0% - 80.0%
MDMA	4	16.9%	2.5%	62.6%	9.3% - 32.3%
Phenacetin	3	1.1%	1.1%	2.0%	
MDA	2		16.9%	20.1%	
Fluorofentanyl Base	2		16.0%	17.5%	
Phencyclidine (PCP)	1		0.9%		
Levamisole	1		0.4%		
Heroin	1		42.7%		
Benzocaine	1		66.7%		
Acetylmorphine (MAM, 6-MAM)	1		0.9%		
Acetylcodeine	1		1.4%		

Table 20. PS-MS quantification of targeted active compounds detected in *expected* dissociative samples, inclusive of all service locations.

**There is a maximum concentration limit that the PS-MS can quantify for each compound of interest. If a sample contains a higher percentage of a compound than the PS-MS limit, then only the upper limit will be reported.*

Benzodiazepines

When checking benzodiazepines, we see a suite of both prescribed benzo samples and non-medical benzos in illicitly manufactured pressed pills. The benzodiazepine supply also has close relations to the opioid -down supply and we also check benzodiazepine powders for suppliers who are performing quality control prior to preparing “benzo-down”. The most common benzo samples that we check are expected alprazolam tablets (49.6% of benzo samples) which often present similar to 2mg Xanax bars. Though alprazolam is expected, alprazolam is only detected in 19.7% (35/178) of expected alprazolam tablets. Instead, non-medical benzos/benzo analogues like bromazolam (found in 36.5% (65/178) of expected alprazolam samples) and flualprazolam (found in 27.5% (49/175) of expected alprazolam samples) are more frequently seen in illicit “Xanax”. Despite “unexpected actives” showing up, these results were not unexpected to a majority of the service users who brought in these samples as many service users suspect other benzos based on their experiential knowledge of the drugs they use and the markets from which they come. Table 21 on page 45 lists the other compounds that are considered “unexpected actives”.

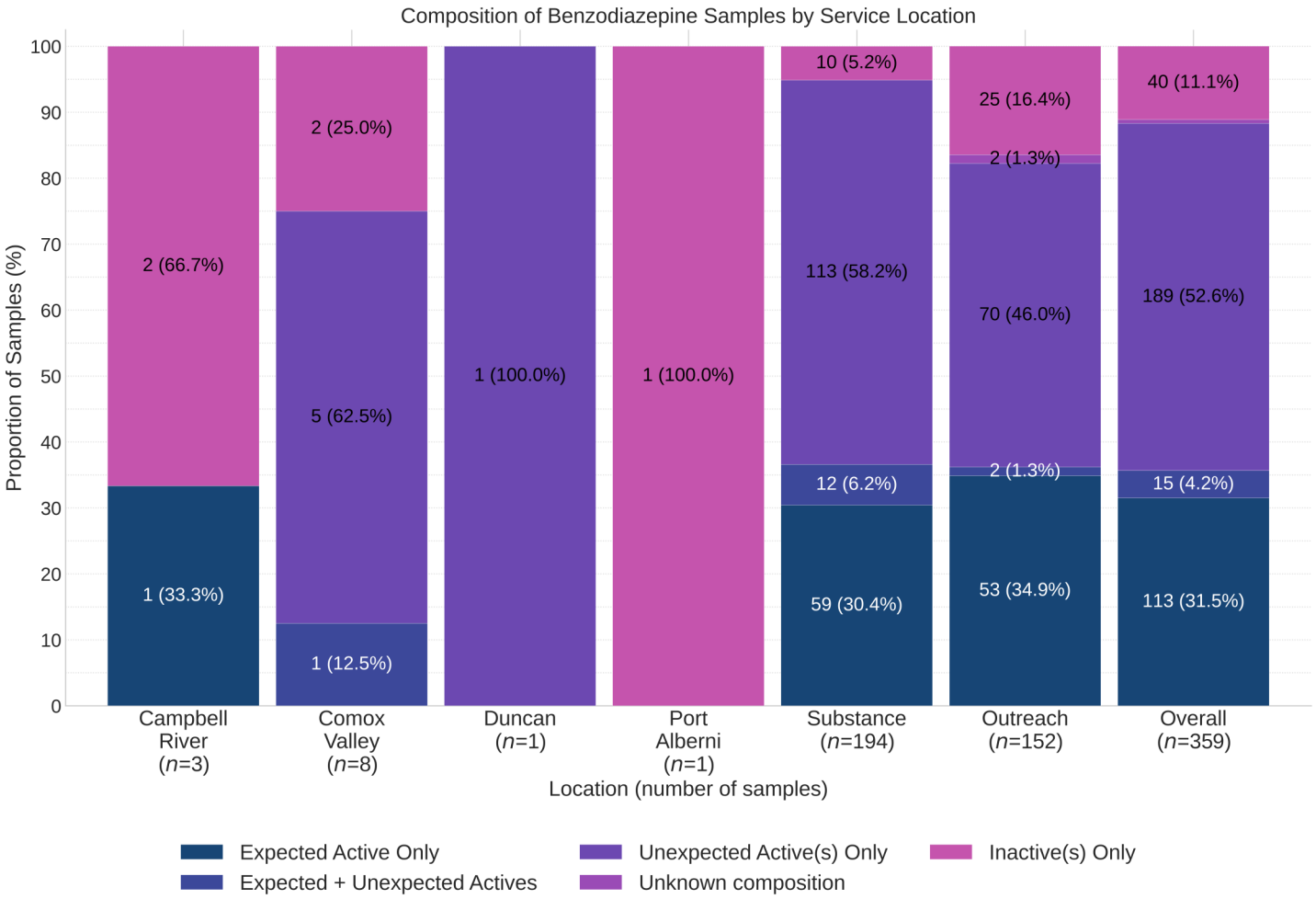


Figure 16. Proportion and number of benzodiazepine samples checked by service locations, grouped by composition class (see page 10 for definitions).

Benzodiazepines: What did we find?

Table 21 below (and on the following page) aggregates all active compounds detected in benzodiazepine samples in 2024, across all service locations. The number of detections, and the prevalence with respect to all benzodiazepine samples checked, is listed. Samples with no detected actives have been excluded for brevity, however Table 22 on page 47 aggregates all cutting agents detected in benzodiazepines, across all service locations. See page 10 for definitions of the different composition classes.

Detected Compounds by Composition Class	**Number of Samples** (% of all benzo samples)
Expected Active Only	**113 (31.5%)**
Alprazolam (Xanax)	33 (9.2%)
Avizafone	9 (2.5%)
Bretazenil	2 (0.6%)
Bromazepam	1 (0.3%)
Bromazolam	20 (5.6%)
Clonazepam (Klonopin)	10 (2.8%)
Diazepam (Valium)	9 (2.5%)
Etizolam	12 (3.3%)
Flualprazolam	9 (2.5%)
Lorazepam (Ativan)	5 (1.4%)
Pyrazolam	1 (0.3%)
Rilmazafone	2 (0.6%)
Expected* + Unexpected Active(s)	**15 (4.2%)**
Alprazolam (Xanax)*	2 (0.6%)
Avizafone*	1 (0.3%)
Bromazolam*	13 (3.6%)
Etizolam*	1 (0.3%)
Fentanyl	6 (1.7%)
Flualprazolam	1 (0.3%)
Fluorofentanyl	9 (2.5%)
Methamphetamine	2 (0.6%)
Metonitazene	1 (0.3%)
Unknown	3 (0.8%)
ortho-Methyl fentanyl	2 (0.6%)

Table 21 *(Continued on the next page)*. Active compounds detected in benzodiazepine samples checked in 2023, inclusive of all service locations.

*Instruments may not be able to detect all ingredients and certainty of interpretations may vary. Multiple substances may be present in one sample and substances may be present in trace concentrations. *Expected active component.*

Benzodiazepines: What did we find? *(Continued)*

Unexpected Active(s) Only	**189 (52.6%)**
Acetaminophen (Paracetamol, Tylenol)	1 (0.3%)
Alprazolam (Xanax)	7 (1.9%)
Benzodiazepine (unknown type)	16 (4.5%)
Bromazepam	1 (0.3%)
Bromazolam	99 (27.6%)
Clonazepam (Klonopin)	2 (0.6%)
Delorazepam	1 (0.3%)
Desalkylgidazepam	2 (0.6%)
Diazepam (Valium)	2 (0.6%)
Etizolam	7 (1.9%)
Fentanyl	12 (3.3%)
Fentanyl Base	1 (0.3%)
Fentanyl or analogue	3 (0.8%)
Flualprazolam	50 (13.9%)
Flubromazepam	3 (0.8%)
Flubromazolam	1 (0.3%)
Fluorofentanyl	1 (0.3%)
Lorazepam (Ativan)	1 (0.3%)
Sildenafil (Viagra)	1 (0.3%)
ortho-Methyl fentanyl	1 (0.3%)
Unknown Composition	**2 (0.6%)**
Unknown	2 (0.6%)

Table 21 *(Continued from previous page).* Active compounds detected in benzodiazepine samples checked in 2023, inclusive of all service locations.

Instruments may not be able to detect all ingredients and certainty of interpretations may vary. Multiple substances may be present in one sample and substances may be present in trace concentrations. "Benzodiazepine (unknown type)" results are based on a positive strip test and are unconfirmed by paper spray.

Benzodiazepines: Cutting Agents

Compound	Number of Samples (% of all benzo samples)	Compound	Number of Samples (% of all benzo samples)
Caffeine	28 (7.8%)	Oil (unknown type)	26 (7.2%)
Carbohydrate (unknown type)	10 (2.8%)	Propylene Glycol	2 (0.6%)
Erythritol (sugar)	12 (3.3%)	Sorbitol (sugar)	4 (1.1%)
Flour	1 (0.3%)	Starch	4 (1.1%)
Lactose (sugar)	53 (14.8%)	Stearic acid	48 (13.4%)
Lactose anhydrous	4 (1.1%)	Sucrose (sugar)	1 (0.3%)
Magnesium sulfate	1 (0.3%)	Sugar (unknown type)	6 (1.7%)
Mannitol (sugar)	2 (0.6%)	Talc	2 (0.6%)
Microcrystalline cellulose	220 (61.3%)	Water	4 (1.1%)
Mineral (unknown type)	5 (1.4%)	Xylitol (sugar)	4 (1.1%)

Table 22. Cutting agents detected in benzodiazepine samples across all service locations. *Quantitative concentrations are not available for these compounds.*

Benzodiazepine: Quantification

Using PS-MS, we were able to quantify the concentration of select compounds detected in benzodiazepine samples. Not all samples can be analyzed via PS-MS, primarily due to samples that are too small to be accurately weighed, so the values listed in Table 23 below may not match those listed in Table 21. Table 23 aggregates the results from all *expected* benzodiazepine samples checked in 2023 across all service locations. Weight percentage is reported below. "IQR" is the interquartile range: the concentration range containing half of the quantified samples.

Compound	# Quant.	Median	Min	Max	IQR
Bromazolam	119	1.2%	<0.1%	>50.0*%	0.5% - 5.2%
Flualprazolam	59	0.4%	<0.1%	1.4%	0.3% - 0.5%
Alprazolam (Xanax)	41	1.8%	0.3%	14.0%	1.0% - 3.2%
Fentanyl	18	2.0%	<0.1%	25.1%	0.7% - 16.3%
Etizolam	17	0.4%	<0.1%	>50.0%*	0.3% - 1.0%
Clonazepam (Klonopin)	11	1.8%	<0.1%	15.2%	1.0% - 5.1%
Diazepam (Valium)	11	5.8%	2.2%	13.1%	3.3% - 8.5%
Fluorofentanyl	10	2.7%	0.3%	7.5%	1.8% - 5.8%

Table 23 *(Continued on the next page)*. PS-MS quantification of targeted active compounds detected in *expected* benzodiazepine samples, inclusive of all service locations.

**There is a maximum concentration limit that the PS-MS can quantify for each compound of interest. If a sample contains a higher percentage of a compound than the PS-MS limit, then only the upper limit will be reported.*

Benzodiazepine: Quantification *(Continued)*

Compound	# Quant.	Median	Min	Max	IQR
Lorazepam (Ativan)	6	2.6%	<0.1%	5.4%	1.8% - 3.0%
ortho-Methyl fentanyl	3	5.9%	1.8%	26.6%	
Desalkylgidazepam	2		0.6%	33.4%	
Bromazepam	2		1.2%	4.9%	
Flubromazepam	2		0.4%	0.6%	
Methamphetamine	2		4.5%	>50.0%*	
Flubromazolam	1		0.6%		
Metonitazene	1		0.8%		
Pyrazolam	1		2.1%		

Table 23 *(Continued from the previous page)*. PS-MS quantification of targeted active compounds detected in *expected* benzodiazepine samples, inclusive of all service locations.

**There is a maximum concentration limit that the PS-MS can quantify for each compound of interest. If a sample contains a higher percentage of a compound than the PS-MS limit, then only the upper limit will be reported.*

Psychedelics

The psychedelics class includes drugs such as lysergamides (LSD), substituted tryptamines (DMT, 5-MeO-MiPT, etc.), some substituted phenethylamines (mescaline, 2C-X), and others (DOM, ibogaine). Our project does not include MDMA/MDA, nor ketamine, into the psychedelics class. Instead this class focuses on what are generally thought of as "classical" psychedelics. Overall, 70.7% of expected psychedelic samples were "as expected", yet, we still see misrepresentations quite regularly. Often times this misrepresentation can be attributed to the often confusing naming convention of psychedelics (sometimes we like to call this "alphabet soup"): 5-MeO-DiPT vs. 5-MeO-MiPT; 5-MeO-DMT vs. DMT; 1P-LSD vs. LSD; 2C-B vs. "Tucibi" (a polysubstance mixture also known "pink cocaine"; often a mixture of cocaine, MDMA, and ketamine) - the list goes on. 25% (10/40) of psychedelic samples that contained unexpected actives were found to contain an analogue of the expected compound. Despite the similar names and structural similarities of many psychedelics, dosage and effect can be vastly different between compounds. 27.5% (11/40) of expected 2C-B samples were consistent with so-called Tucibi. Overall, we hope that drug checking can aide people in informing dose and in understanding experience.

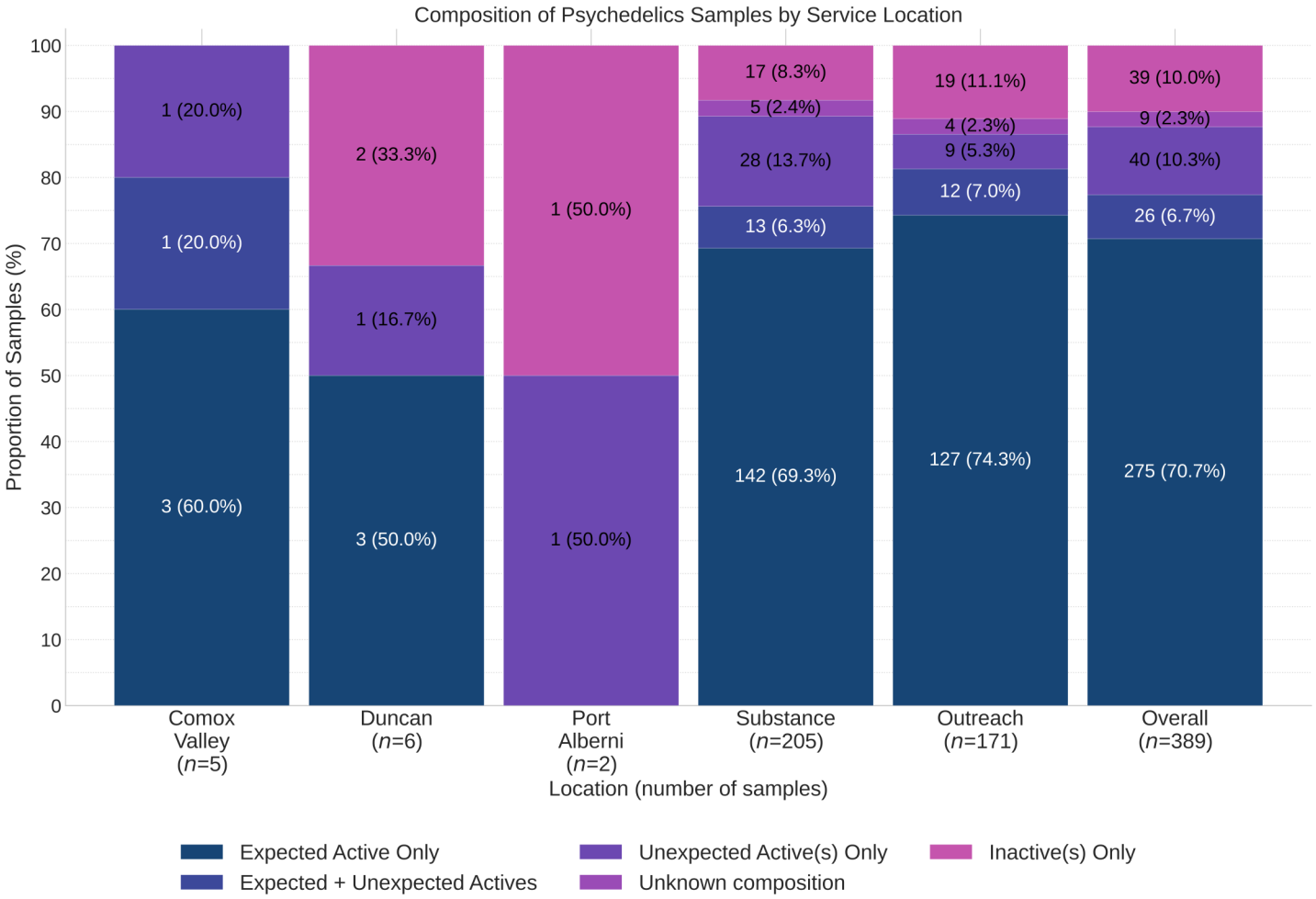


Figure 17. Proportion and number of psychedelic samples checked by service locations, grouped by composition class (see page 10 for definitions).

Psychedelics: What did we find?

Table 24 below (and on the following page) aggregates all active compounds detected in psychedelic samples in 2023, across all service locations. The number of detections, and the prevalence with respect to all psychedelic samples checked, is listed. Samples with no detected actives have been excluded for brevity, however Table 25 on page 53 aggregates all cutting agents detected in psychedelics, across all service locations. See page 10 for definitions of the different composition classes.

Detected Compounds by Composition Class	**Number of Samples** (% of all psychedelic samples)
Expected Active Only	**275 (70.7%)**
1cP-LSD	1 (0.3%)
25C-NBOMe	1 (0.3%)
2C-B	103 (26.5%)
2C-D	2 (0.5%)
2C-E	1 (0.3%)
2C-I	1 (0.3%)
3C-P	4 (1.0%)
4-AcO-DET	1 (0.3%)
4-AcO-DMT (O-Acetylpsilocin)	3 (0.8%)
4-AcO-MET	1 (0.3%)
4-HO-DiPT	3 (0.8%)
4-HO-MET (Metocin, Colour)	5 (1.3%)
4-PrO-DMT	1 (0.3%)
5-MeO-DALT	1 (0.3%)
5-MeO-DMT	15 (3.9%)
5-MeO-DMT Base	1 (0.3%)
5-MeO-DiPT (Foxy)	2 (0.5%)
5-MeO-MALT	1 (0.3%)
5-MeO-MiPT (Moxy)	2 (0.5%)
5-bromo-DMT	1 (0.3%)
ALD-52	1 (0.3%)

Table 24 *(Continued on the next page)*. Active compounds detected in psychedelic samples checked in 2024, inclusive of all service locations.

*Instruments may not be able to detect all ingredients and certainty of interpretations may vary. Multiple substances may be present in one sample and substances may be present in trace concentrations. *Expected active component. "Fentanyl or analogue" and "Benzodiazepine (unknown type)" results are based on a positive strip test and are unconfirmed by paper spray.*

Psychedelics: What did we find? *(Continued)*

Detected Compounds by Composition Class	**Number of Samples** (% of all psychedelic samples)
Expected Active Only	**275 (70.7%)**
AMT (alpha-Methyltryptamine)	1 (0.3%)
Bufotenine	1 (0.3%)
Cocaine HCl (powder)	2 (0.5%)
DMT (Dimethyltryptamine)	14 (3.6%)
DOM	1 (0.3%)
DPT	2 (0.5%)
Ibogamine	1 (0.3%)
Ketamine	11 (2.8%)
LSD (acid)	75 (19.3%)
MDMA	11 (2.8%)
Mescaline	17 (4.4%)
Methallylescaline	2 (0.5%)
Expected* + Unexpected Active(s)	**26 (6.7%)**
2C-B*	4 (1.0%)
5-MeO-DMT*	4 (1.0%)
Ibogaine*	1 (0.3%)
DOM*	1 (0.3%)
4-AcO-DMT (O-Acetylpsilocin)	1 (0.3%)
2C-H	2 (0.5%)
Cocaine HCl (powder)	3 (0.8%)
Ketamine	13 (3.3%)
MDA	12 (3.1%)
MDMA	15 (3.9%)
Methamphetamine	2 (0.5%)
Phenacetin	3 (0.8%)
Unknown	9 (2.3%)

Table 24 *(Continued from previous page). A*ctive compounds detected in psychedelic samples checked in 2024, inclusive of all service locations.

*Instruments may not be able to detect all ingredients and certainty of interpretations may vary. Multiple substances may be present in one sample and substances may be present in trace concentrations. *Expected active component.*

Psychedelics: What did we find? *(Continued)*

Detected Compounds by Composition Class	**Number of Samples** (% of all psychedelic samples)
Unexpected Active(s) Only	**40 (10.3%)**
1cP-LSD	1 (0.3%)
25C-NBOMe	2 (0.5%)
2C-B	2 (0.5%)
2C-E	1 (0.3%)
2C-X	1 (0.3%)
3-MMC (Metaphedrone)	1 (0.3%)
4-AcO-DMT (O-Acetylpsilocin)	1 (0.3%)
4-HO-DiPT	2 (0.5%)
5-MeO-DMT	2 (0.5%)
5-MeO-DMT Base	3 (0.8%)
Alcohol (Ethanol)	2 (0.5%)
Bromantane	1 (0.3%)
Bromazolam	1 (0.3%)
Cathinone (unknown type)	1 (0.3%)
Cocaine HCl (powder)	9 (2.3%)
Fentanyl	1 (0.3%)
Ketamine	10 (2.6%)
MDA	4 (1.0%)
MDMA	11 (2.8%)
Methallylescaline	1 (0.3%)
Methamphetamine	1 (0.3%)
Procaine	1 (0.3%)
Unknown	1 (0.3%)
Unknown Composition	**9 (2.3%)**
Unknown	9 (2.3%)

Table 24 *(Continued from previous page). A*ctive compounds detected in psychedelic samples checked in 2024, inclusive of all service locations.

Instruments may not be able to detect all ingredients and certainty of interpretations may vary. Multiple substances may be present in one sample and substances may be present in trace concentrations.

Psychedelics: Cutting Agents

Compound	Number of Samples (% of all psychedelic samples)
Caffeine	26 (6.7%)
Carbohydrate (unknown type)	13 (3.3%)
Creatine	1 (0.3%)
Dextrose	1 (0.3%)
Dimethyl sulfone (MSM)	3 (0.8%)
Erythritol (sugar)	1 (0.3%)
Lactose (sugar)	2 (0.5%)
Mannitol (sugar)	20 (5.1%)
Microcrystalline cellulose	18 (4.6%)
Mineral (unknown type)	1 (0.3%)
Oil (unknown type)	7 (1.8%)
Propylene Glycol	2 (0.5%)
Starch	3 (0.8%)
Stearic acid	1 (0.3%)
Sucrose (sugar)	1 (0.3%)
Sugar (unknown type)	6 (1.5%)
Water	15 (3.9%)

Table 25. Cutting agents detected in psychedelic samples across all service locations. *Quantitative concentrations are not available for these compounds.*

*Instruments may not be able to detect all ingredients and certainty of interpretations may vary. Multiple substances may be present in one sample and substances may be present in trace concentrations. *Expected active component. "Fentanyl or analogue" and "Benzodiazepine (unknown type)" results are based on a positive strip test and are unconfirmed by paper spray.*

Psychedelics: Quantification

Using PS-MS, we were able to quantify the concentration of select compounds detected in psychedelic samples. Not all samples can be analyzed via PS-MS, primarily due to samples that are too small to be accurately weighed, so the values listed in Table 25 below may not match those listed in Table 24. Table 26 aggregates the results from all *expected* psychedelic samples checked in 2023 across all service locations. Weight percentage is reported below. "IQR" is the interquartile range: the concentration range containing half of the quantified samples.

Compound	# Quant.	Median	Min	Max	IQR
2C-B	61	>50.0%*	1.5%	>80.0%*	17.7% - 80.0%
LSD (acid)	48	1.6%	<0.1%	>50.0%*	0.5% - 2.9%
MDMA	32	24.6%	1.4%	>50.0%*	18.5% - 33.6%
Ketamine	28	34.0%	<0.1%	>80.0%*	24.1% - 50.0%
5-MeO-DMT	19	>50.0%*	0.4%	>80.0%*	32.4% - 52.3%
MDA	15	5.0%	2.4%	18.0%	3.6% - 8.0%
4-AcO-DMT (O-Acetylpsilocin)	4	23.6%	14.3%	>80.0%*	20.9% - 38.1%
25C-NBOMe	3	6.7%	4.9%	22.5%	
Methamphetamine	3	14.1%	7.5%	19.3%	
Phenacetin	3	6.2%	4.7%	>50.0%*	
5-MeO-DMT Base	3	75.7%	23.1%	78.1%	
5-MeO-MiPT (Moxy)	2		>50.0%*	>50.0%*	
2C-I	1		33.1%		
Procaine	1		3.5%		
Bromazolam	1		7.6%		
DMT (Dimethyltryptamine)	1		>80.0%*		
Fentanyl	1		11.2%		

Table 26. PS-MS quantification of targeted active compounds detected in *expected* psychedelic samples, inclusive of all service locations.

**There is a maximum concentration limit that the PS-MS can quantify for each compound of interest. If a sample contains a higher percentage of a compound than the PS-MS limit, then only the upper limit will be reported.*

Opioid–Other

We group prescription opioids like hydromorphone (Dilaudid), oxycodone (Oxycontin and Percocet), morphine (Kadian), and their illicitly manufactured look-alikes into the opioid–other category. Samples expected to contain oxycodone were the most common other opioids checked and also displayed the highest prevalence of unexpected compounds. 50.2% (126/251) of opioid–other samples were expected to contain oxycodone, either as oxycodone alone or as Percocet (oxycodone + acetaminophen), however, only 54.8% (69/126) of these samples were "as expected". Nitazenes were found in 15.9% (20/126) of Oxycontin and Percocet samples which contained unexpected actives. In comparison, 89 samples were expected to be hydromorphone; 65.2% (58/89) were as expected, nitazenes were detected in 12/24 hydromorphone samples containing unexpected actives. Table 43 on page 81 gives a full break down of which and how many unexpected opioids were detected in "opioid - other" samples.

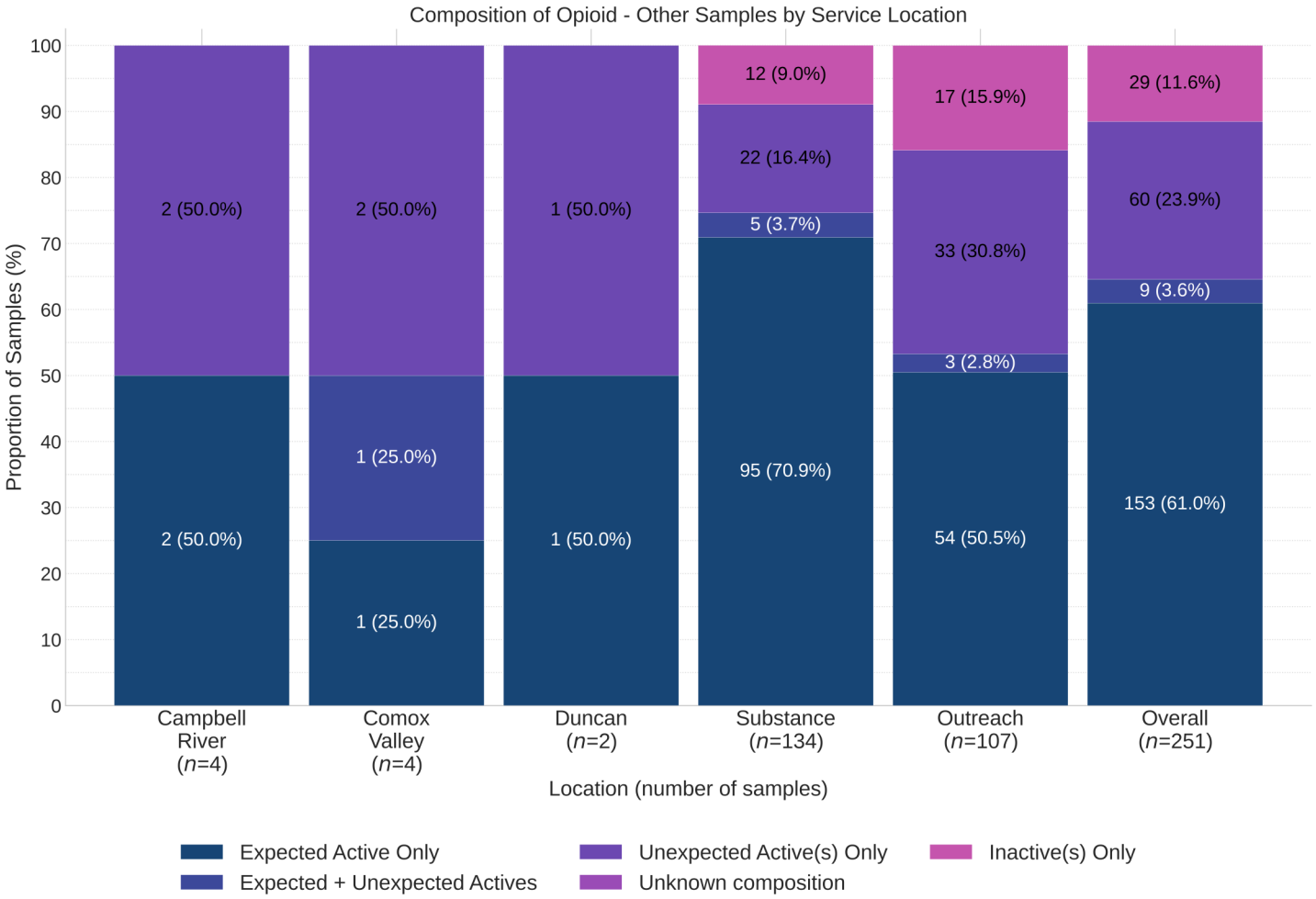


Figure 18. Proportion and number of opioid–other samples checked by service locations, grouped by composition class (see page 10 for definitions).

Opioid–Other: What did we find?

Table 27 below aggregates all active compounds detected in opioid–other samples in 2024, across all service locations. The number of detections, and the prevalence with respect to all opioid–other samples checked, is listed. Samples with no detected actives have been excluded for brevity, however Table 28 on page 58 aggregates all cutting agents detected in opioid–other samples, across all service locations. See page 10 for definitions of the different composition classes.

Detected Compounds by Composition Class	**Number of Samples** (% of all opioid-other samples)
Expected Active Only	**153 (61.0%)**
Acetaminophen (Paracetamol, Tylenol)	17 (6.8%)
Desmetramadol (O-DSMT)	1 (0.4%)
Hydromorphone (Dilaudid, Dillies)	58 (23.1%)
Methadone	1 (0.4%)
Morphine	16 (6.4%)
Opium	3 (1.2%)
Oxycodone (Oxycontin)	69 (27.5%)
Tapentadol	1 (0.4%)
Tramadol	5 (2.0%)
Expected* + Unexpected Active(s)	**9 (3.6%)**
Acetaminophen (Paracetamol, Tylenol)*	4 (1.6%)
Codeine (T3's / T4's)*	4 (1.6%)
Hydromorphone (Dilaudid, Dillies)*	1 (0.4%)
Oxycodone (Oxycontin)*	4 (1.6%)
Benzodiazepine (unknown type)	1 (0.4%)
Diclofenac (Voltaren)	1 (0.4%)
Fentanyl or analogue	1 (0.4%)
Phenacetin	1 (0.4%)
Unknown	2 (0.8%)
Unexpected Active(s) Only	**60 (23.9%)**
Acetaminophen (Paracetamol, Tylenol)	3 (1.2%)
Amphetamine	1 (0.4%)
Benzodiazepine (unknown type)	1 (0.4%)

Table 27 *(Continued on the next page)*. Active compounds detected in opioid–other samples checked in 2023, inclusive of all service locations.

*Instruments may not be able to detect all ingredients and certainty of interpretations may vary. Multiple substances may be present in one sample and substances may be present in trace concentrations. *Expected active component. "Fentanyl or analogue" and "Benzodiazepine (unknown type)" results are based on a positive strip test and are unconfirmed by paper spray.*

Opioid–Other: What did we find? *(Continued)*

Detected Compounds by Composition Class	**Number of Samples** (% of all psychedelic samples)
Unexpected Active(s) Only	**60 (23.9%)**
Bromazolam	1 (0.4%)
Desalkylgidazepam	3 (1.2%)
Fentanyl	5 (2.0%)
Fentanyl analogue (unknown type)	3 (1.2%)
Fentanyl or analogue	3 (1.2%)
Fluorofentanyl	2 (0.8%)
Fluorofentanyl Base	2 (0.8%)
Gabapentin	1 (0.4%)
Hydromorphone (Dilaudid, Dillies)	2 (0.8%)
Isotonitazene	13 (5.2%)
Metonitazene (Metonitazine)	13 (5.2%)
Morphine	1 (0.4%)
N-Propionyl Para-Fluoro Norfentanyl Base	2 (0.8%)
N-Pyrrolidino Etonitazene	1 (0.4%)
N-desethyl isotonitazene	8 (3.2%)
Oxycodone (Oxycontin)	3 (1.2%)
Tamoxifen	1 (0.4%)
Tramadol	1 (0.4%)
Xylazine	1 (0.4%)

Table 27 *(Continued from the previous page)*. Active compounds detected in opioid–other samples checked in 2023, inclusive of all service locations.

*Instruments may not be able to detect all ingredients and certainty of interpretations may vary. Multiple substances may be present in one sample and substances may be present in trace concentrations. *Expected active component. "Fentanyl or analogue" and "Benzodiazepine (unknown type)" results are based on a positive strip test and are unconfirmed by paper spray.*

Opioid–Other: Cutting Agents

Compound	Number of Samples (% of all opioid - other samples)
Caffeine	3 (1.2%)
Carbohydrate (unknown type)	30 (12.0%)
Dextrose	2 (0.8%)
Dextrose anhydrous	1 (0.4%)
Dicalcium phosphate	3 (1.2%)
Fructose (sugar)	1 (0.4%)
Inositol (sugar)	1 (0.4%)
Lactose (sugar)	41 (16.3%)
Lactose anhydrous	13 (5.2%)
Magnesium sulfate	3 (1.2%)
Mannitol (sugar)	1 (0.4%)
Microcrystalline cellulose	86 (34.3%)
Mineral (unknown type)	17 (6.8%)
Oil (unknown type)	18 (7.2%)
Polyethylene glycol (PEG)	6 (2.4%)
Sodium bicarbonate (Baking soda)	1 (0.4%)
Sorbitol (sugar)	1 (0.4%)
Stearic acid	5 (2.0%)
Sucrose (sugar)	17 (6.8%)
Sugar (unknown type)	35 (13.9%)
Talc	2 (0.8%)
Water	2 (0.8%)
Xylitol (sugar)	2 (0.8%)

Table 28. Cutting agents detected in opioid–other samples across all service locations. *Quantitative concentrations are not available for these compounds.*

Instruments may not be able to detect all ingredients and certainty of interpretations may vary. Multiple substances may be present in one sample and substances may be present in trace concentrations.

Opioid–Other: Quantification

Using PS-MS, we were able to quantify the concentration of select compounds detected in opioid other samples. Not all samples can be analyzed via PS-MS, primarily due to samples that are too small to be accurately weighed, so the values listed in Table 28 below may not match those listed in Table 26. Table 29 aggregates the results from all *expected* opioid–other samples checked in 2024 across all service locations. Weight percentage is reported below. "IQR" is the interquartile range: the concentration range containing half of the quantified samples.

Compound	# Quant.	Median	Min	Max	IQR
Oxycodone (Oxycontin)	75	4.9%	<0.1%	43.4%	2.0% - 6.9%
Hydromorphone (Dilaudid, Dillies)	59	4.3%	0.8%	11.0%	2.9% - 6.7%
Morphine	14	13.8%	0.8%	42.8%	5.1% - 20.7%
Isotonitazene	13	0.5%	<0.1%	1.1%	0.3% - 0.8%
Metonitazene	13	4.3%	0.4%	>25.0%*	0.9% - 8.0%
N-desethyl isotonitazene	8	0.8%	0.2%	1.7%	0.4% - 1.0%
Tramadol	6	10.6%	1.1%	42.9%	7.3% - 18.7%
Fentanyl	5	0.8%	<0.1%	3.2%	0.3% - 1.9%
Codeine (T3's / T4's)	3	6.5%	<0.1%	13.2%	
Fluorofentanyl	2		0.2%	0.5%	
Fluorofentanyl Base	2		0.5%	>50.0%*	
Desalkylgidazepam	1		<0.1%		
Xylazine	1		1.2%		
Gabapentin	1		20.7%		
Methadone	1		25.6%		
N-Pyrrolidino Etonitazene	1		0.5%		
Bromazolam	1		14.9%		

Table 29. PS-MS quantification of targeted active compounds detected in *expected* opioid–other samples, inclusive of all service locations.

**There is a maximum concentration limit that the PS-MS can quantify for each compound of interest. If a sample contains a higher percentage of a compound than the PS-MS limit, then only the upper limit will be reported.*

Stimulants–Other

The "stimulants–other" class includes all stimulant samples outside of cocaine, methamphetamine, and MDMA/MDA and includes drugs like prescription amphetamines (Adderall and Dexedrine), methylphenidate (Ritalin/Concerta), and stimulating substituted cathinones like 3-MMC and 4-MMC. The most common misrepresentation that we see within the simulants are methamphetamine pressed pills that are expected to be Adderall, Dexedrine, or amphetamine in general. 59 samples checked in 2024 were expected to contain amphetamine in some form (Adderall, Dexedrine, amphetamine, amphetamine + methamphetamine). Of these, 33.9% (20/59) contained an unexpected active (17 contained methamphetamine, 1 contained methylphenidate, 1 contained 4F-MPH, and 1 contained Tramadol). The most commonly expected stimulant was 3-MMC (a.k.a. metaphedrone), 64.9% (24/37) of 3-MMC samples were as expected. Out of the remaining 13 samples, 7 contained unexpected actives only, 5 contained additional actives, and 1 did not contain any active components

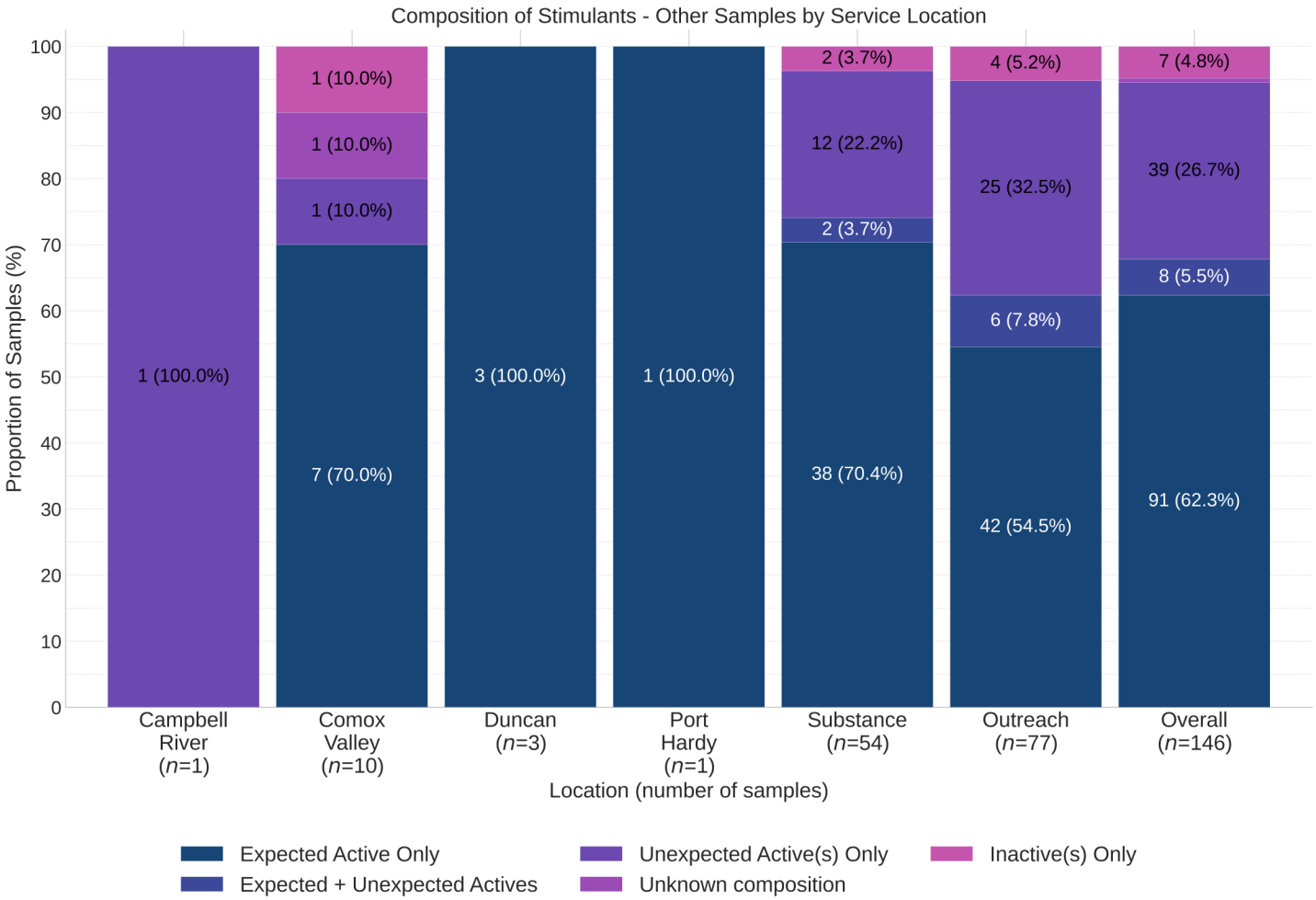


Figure 19. Proportion and number of opioid–other samples checked by service locations, grouped by composition class (see page 10 for definitions).

Stimulants–Other: What did we find?

Table 30 below aggregates all active compounds detected in stimulant–other samples in 2023, across all service locations. The number of detections, and the prevalence with respect to all stimulant–other samples checked, is listed. Samples with no detected actives have been excluded for brevity, however Table 31 aggregates all cutting agents detected in stimulant–other samples, across all service locations. See page 10 for definitions of the different composition classes.

Detected Compounds by Composition Class	**Number of Samples** (% of all stimulant-other samples)
Expected Active Only	**91 (62.3%)**
2-FMA	1 (0.7%)
2-MMC	2 (1.4%)
3-MMC (Metaphedrone)	24 (16.4%)
4-FMA	1 (0.7%)
4-MMC (Mephedrone)	17 (11.6%)
4F-MPH	1 (0.7%)
Amphetamine	26 (17.8%)
Lisdexamfetamine dimesylate (Vyvanse)	10 (6.8%)
MDPM	3 (2.1%)
Methylphenidate (Ritalin)	2 (1.4%)
Modafinil	3 (2.1%)
N-Ethylhexedrone (Hexen)	1 (0.7%)
Expected* + Unexpected Active(s)	**8 (5.5%)**
2-MMC*	1 (0.7%)
3-MMC (Metaphedrone)*	5 (3.4%)
4-MMC (Mephedrone)*	1 (0.7%)
Amphetamine*	1 (0.7%)
MDMA	1 (0.7%)
Methamphetamine	1 (0.7%)
Unknown	6 (4.1%)
Unexpected Active(s) Only	**39 (26.7%)**
2-MMC	4 (2.7%)
3-MMC (Metaphedrone)	1 (0.7%)

Table 30 *(Continued on the next page)*. Active compounds detected in opioid–other samples checked in 2023, inclusive of all service locations.

*Instruments may not be able to detect all ingredients and certainty of interpretations may vary. Multiple substances may be present in one sample and substances may be present in trace concentrations. *Expected active component.*

Stimulants–Other: What did we find?

Detected Compounds by Composition Class	**Number of Samples** (% of all stimulant-other samples)
Unexpected Active(s) Only	**39 (26.7%)**
4-CMC (Clephedrone)	4 (2.7%)
4-FA (4-Fluoroamphetamine)	1 (0.7%)
4-HO-MET (Metocin, Colour)	1 (0.7%)
4-MMC (Mephedrone)	1 (0.7%)
4F-MPH	1 (0.7%)
Amphetamine	1 (0.7%)
Cocaine HCl (powder)	1 (0.7%)
MDA	1 (0.7%)
MDPM	1 (0.7%)
Methamphetamine	19 (13.0%)
Methylphenidate (Ritalin)	1 (0.7%)
N-Ethylhexedrone (Hexen)	1 (0.7%)
N-ethylpentylone	1 (0.7%)
Tramadol	1 (0.7%)
Unknown	3 (2.1%)
Unknown Composition	**1 (0.7%)**
Unknown	1 (0.7%)

Table 30 *(Continued from the previous page)*. Active compounds detected in opioid–other samples checked in 2023, inclusive of all service locations.

*Instruments may not be able to detect all ingredients and certainty of interpretations may vary. Multiple substances may be present in one sample and substances may be present in trace concentrations. *Expected active component.*

Stimulants–Other: Cutting Agents

Compound	**Number of Samples** (% of all stimulant - other samples)
Caffeine	16 (11.0%)
Carbohydrate (unknown type)	2 (1.4%)
Lactose (sugar)	7 (4.8%)
Lactose anhydrous	2 (1.4%)
Mannitol (sugar)	3 (2.1%)
Microcrystalline cellulose	38 (26.0%)
Mineral (unknown type)	1 (0.7%)
Oil (unknown type)	3 (2.1%)
Polyethylene glycol (PEG)	1 (0.7%)
Sodium bicarbonate (Baking soda)	1 (0.7%)
Stearic acid	6 (4.1%)
Sucrose (sugar)	15 (10.3%)
Sugar (unknown type)	3 (2.1%)
Talc	2 (1.4%)
Water	2 (1.4%)

Table 31. Cutting agents detected in stimulant–other samples across all service locations. *Quantitative concentrations are not available for these compounds.*

*Instruments may not be able to detect all ingredients and certainty of interpretations may vary. Multiple substances may be present in one sample and substances may be present in trace concentrations. *Expected active component. "Fentanyl or analogue" and "Benzodiazepine (unknown type)" results are based on a positive strip test and are unconfirmed by paper spray.*

Stimulants–Other: Quantification

Using PS-MS, we were able to quantify the concentration of select compounds detected in stimulant samples. Not all samples can be analyzed via PS-MS, primarily due to samples that are too small to be accurately weighed, so the values listed in tables below may not match those listed in Tables 30. Weight percentage is reported below. "IQR" is the inter-quartile range: the concentration range containing half of the quantified samples.

Compound	# Quant.	Median	Min	Max	IQR
Amphetamine	24	8.3%	<0.1%	>80.0%*	5.4% - 11.7%
Methamphetamine	5	4.9%	<0.1%	12.9%	3.4% - 8.1%
Tramadol	1		21.4%		
N-ethylpentylone	1		1.1%		
MDMA	1		26.6%		
MDA	1		48.0%		
4-FMA	1		4.8%		
4-FA (4-Fluoroamphetamine)	1		>50.0%*		

Table 32. PS-MS quantification of targeted active compounds detected in *expected* stimulant–other samples, inclusive of all service locations.

**There is a maximum concentration limit that the PS-MS can quantify for each compound of interest. If a sample contains a higher percentage of a compound than the PS-MS limit, then only the upper limit will be reported.*

Depressants–Other

"Depressants–Other" describe samples that are non-opioid and non-benzodiazepine depressants like GHB, GBL, gabapentin, and the "Z-drugs" (zopiclone and zolpidem). Expected GHB samples make up a majority of these samples, representing 61.7% (71/115) of "depressant–other" samples checked. Expected zopiclone is the second most common other depressant making up 13.0% (15/115) of the samples checked within this drug class.

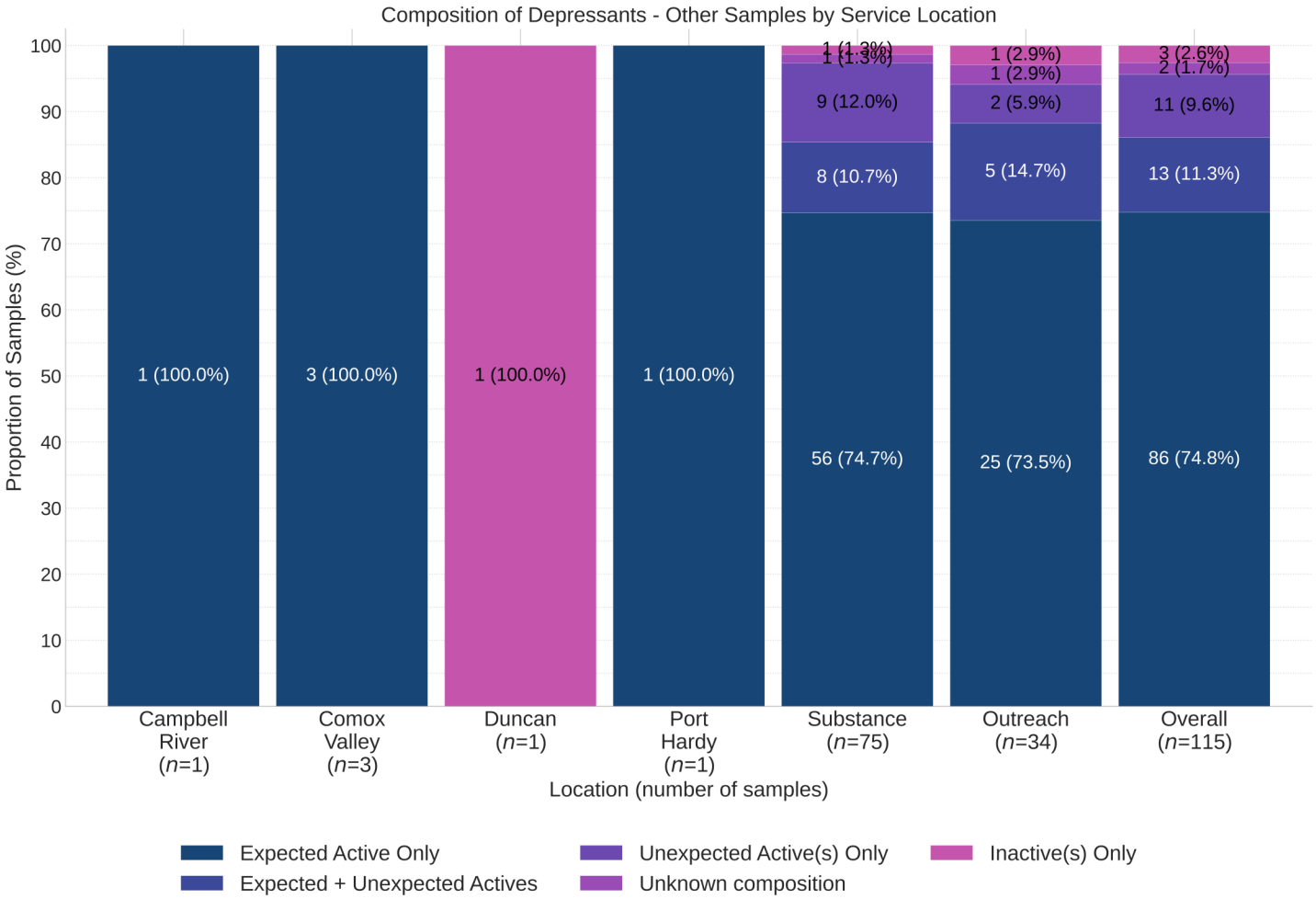


Figure 20. Proportion and number of depressants–other samples checked by service locations, grouped by composition class (see page 10 for definitions).

Depressants–Other: What did we find?

Table 33 below aggregates all active compounds detected in depressant-other samples in 2024, across all service locations. The number of detections, and the prevalence with respect to all depressant–other samples checked, is listed. Samples with no detected actives have been excluded for brevity, however Table 34 aggregates all cutting agents detected in depressant-other samples, across all service locations. See page 10 for definitions of the different composition classes.

Detected Compounds by Composition Class	**Number of Samples** (% of all depressant-other samples)
Expected Active Only	**86 (74.8)**
Carisoprodol (SOMA)	1 (0.9%)
GBL	1 (0.9%)
GHB	49 (42.6%)
Gabapentin	3 (2.6%)
Gaboxadol	1 (0.9%)
Nitromethaqualone	2 (1.7%)
Phenibut	7 (6.1%)
Pregabalin	4 (3.5%)
Quetiapine (Seroquel)	1 (0.9%)
Zolpidem (Ambien)	3 (2.6%)
Zopiclone	14 (12.2%)
Expected* + Unexpected Active(s)	**13 (11.3%)**
GBL*	10 (8.7%)
GHB*	12 (10.4%)
1,4-Butanediol	3 (2.6%)
Benzodiazepine (unknown type)	1 (0.9%)
Unknown	3 (2.6%)
Zopiclone	1 (0.9%)

Table 33 *(Continued on the next page)*. Active compounds detected in depressant-other samples checked in 2024, inclusive of all service locations.

*Instruments may not be able to detect all ingredients and certainty of interpretations may vary. Multiple substances may be present in one sample and substances may be present in trace concentrations. *Expected active component.*

Depressants–Other: What did we find? *(Continued)*

Detected Compounds by Composition Class	**Number of Samples** (% of all depressant-other samples)
Unexpected Active(s) Only	**11 (9.6%)**
1,4-Butanediol	7 (6.1%)
Alcohol (Ethanol)	1 (0.9%)
GBL	2 (1.7%)
GHB	1 (0.9%)
MDA	1 (0.9%)
MDMA	1 (0.9%)
Unknown Composition	**2 (1.7%)**
Unknown	2 (1.7%)

Table 33 *(Continued from the previous page)*. Active compounds detected in depressant-other samples checked in 2024, inclusive of all service locations.

*Instruments may not be able to detect all ingredients and certainty of interpretations may vary. Multiple substances may be present in one sample and substances may be present in trace concentrations. *Expected active component.*

Depressants–Other: Cutting agents

Compound	**Number of Samples** (% of all depressant - other samples)
Carbohydrate (unknown type)	2 (1.7%)
Lactose (sugar)	11 (9.6%)
Lactose anhydrous	1 (0.9%)
Microcrystalline cellulose	4 (3.5%)
Mineral (unknown type)	4 (3.5%)
Oil (unknown type)	3 (2.6%)
Propylene Glycol	2 (1.7%)
Starch	2 (1.7%)
Sugar (unknown type)	5 (4.3%)
Talc	2 (1.7%)
Water	55 (47.8%)

Table 34. Cutting agents detected in depressant-other samples across all service locations. Quantitative concentrations are not available for these compounds.

*Instruments may not be able to detect all ingredients and certainty of interpretations may vary. Multiple substances may be present in one sample and substances may be present in trace concentrations. *Expected active component. "Fentanyl or analogue" and "Benzodiazepine (unknown type)" results are based on a positive strip test and are unconfirmed by paper spray.*

Depressants–Other: Quantification

Using PS-MS, we were able to quantify the concentration of select compounds detected in depressant samples. Not all samples can be analyzed via PS-MS, primarily due to samples that are too small to be accurately weighed, so the values listed in tables below may not match those listed in Tables 33. Weight percentage is reported below. "IQR" is the inter-quartile range: the concentration range containing half of the quantified samples.

Compound	# Quant.	Median	Min	Max	IQR
Zopiclone	8	2.2%	<0.1%	6.7%	<0.1% - 4.8%
Zolpidem (Ambien)	3	15.0%	8.8%	20.3%	
Gabapentin	3	25.0%	25.0%	>25.0%*	
Pregabalin	1		13.6%		
Nitromethaqualone	1		<0.1%		
MDMA	1		10.6%		
MDA	1		1.5%		

Table 35. PS-MS quantification of targeted active compounds detected in *expected* depressant–other samples, inclusive of all service locations.

**There is a maximum concentration limit that the PS-MS can quantify for each compound of interest. If a sample contains a higher percentage of a compound than the PS-MS limit, then only the upper limit will be reported.*

Other categories

All other drugs that do not fit into the aforementioned categories are classified as “Other”. This includes samples like cannabis (and its extracts), steroids, cutting agents, precursors, various pharmaceuticals, and some polysubstance mixtures. The complexity of plant material presents a challenge when examining cannabis on FTIR. While we are often able to confirm the presence of THC and/or CBD in cannabis products, we do not have the methodology to determine concentrations of THC or CBD. THC and CBD present a unique challenge with PS-MS as well since both compounds are isobaric and are structurally quite similar; differentiating these compounds with PS-MS is beyond our current methodology. At best, we screen cannabis samples for any unexpected substances. The analysis of steroids on FTIR has unique limitations as well. Most steroids brought to our service are delivered in a carrier oil that often complicates the analysis of the FTIR spectrum. Furthermore, we do not have comprehensive spectral libraries available for all of the different esters, meaning we can often only narrow a steroid down to a broad class like “Nandrolone (unknown type)”. Similarly, our spectral libraries for pharmaceuticals are not exhaustive and there are some samples checked for which we do not have a reference spectrum. In these scenarios, we rely on other resources, untargeted analysis on PS-MS, Raman spectroscopy, and/or collaboration with other drug checking projects to help the identity the compound.

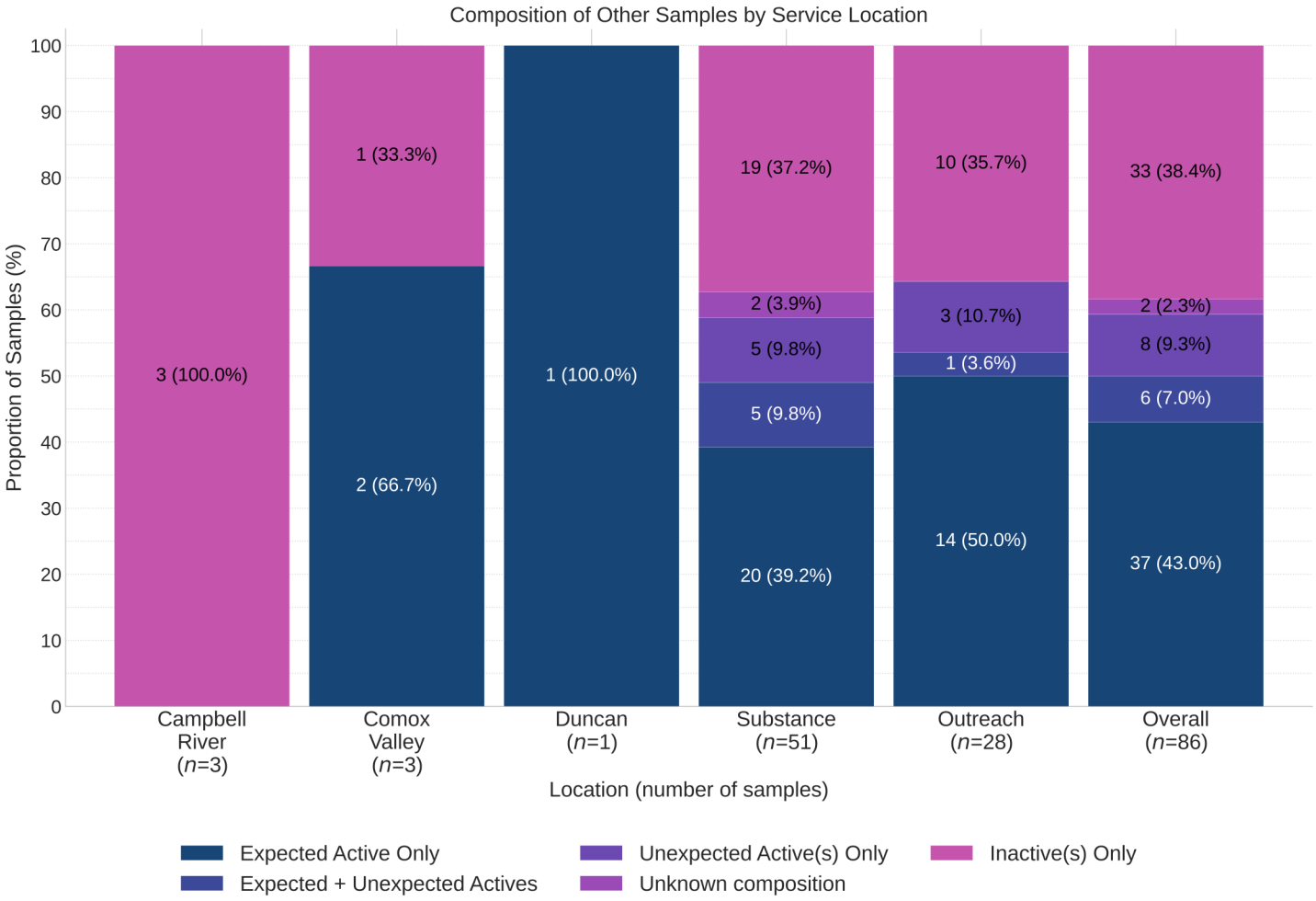


Figure 21. Proportion and number of other samples checked by service locations, grouped by composition class (see page 10 for definitions).

Other categories: What did we find?

Table 36 below aggregates all active compounds detected in "other" samples in 2024, across all service locations. The number of detections, and the prevalence with respect to all "other" samples checked, is listed. Samples with no detected actives have been excluded for brevity, however Table 37 on page 72 aggregates all cutting agents detected in "other" samples, across all service locations. See page 10 for definitions of the different composition classes.

Detected Compounds by Composition Class	**Number of Samples** (% of all other samples)
Expected Active Only	**46 (35.4%)**
9-Me-BC	1 (0.8%)
Acetaminophen (Paracetamol, Tylenol)	2 (1.5%)
Baclofen	1 (0.8%)
Bupropion	1 (0.8%)
Cannabidiol (CBD)	2 (1.5%)
Cannabigero (CBG)	1 (0.8%)
Cannabis	1 (0.8%)
Cyclobenzaprine (Flexeril)	1 (0.8%)
Diclofenac (Voltaren)	1 (0.8%)
Drostanolone propionate	1 (0.8%)
Estradiol	1 (0.8%)
MDA	1 (0.8%)
Mesterolone (Proviron)	1 (0.8%)
Oxandrolone	4 (3.1%)
Sildenafil (Viagra)	10 (7.7%)
Stanozolol	1 (0.8%)
THC	4 (3.1%)
Tadalafil (Cialis)	19 (14.6%)
Testosterone enanthate	1 (0.8%)
Expected* + Unexpected Active(s)	**6 (4.6%)**
Benzocaine*	1 (0.8%)
Sildenafil (Viagra)*	3 (2.3%)
THC*	1 (0.8%)
Tadalafil (Cialis)*	2 (1.5%)

Table 36 *(Continued on the next page)*. Active compounds detected in "other" samples checked in 2024, inclusive of all service locations.

Other categories: What did we find? *(Continued)*

Detected Compounds by Composition Class	**Number of Samples** (% of all other samples)
Expected* + Unexpected Active(s)	**6 (4.6%)**
Fentanyl or analogue	2 (1.5%)
Bromazolam	1 (0.8%)
Dapoxetine	1 (0.8%)
Fentanyl	1 (0.8%)
Unexpected Active(s) Only	**24 (18.5%)**
16-BMK glycidate	1 (0.8%)
Aspirin	1 (0.8%)
Clomiphene	2 (1.5%)
Diclofenac (Voltaren)	2 (1.5%)
Diphenhydramine (Benadryl)	1 (0.8%)
Fentanyl	1 (0.8%)
Methandrostenolone	3 (2.3%)
Methenolone acetate	1 (0.8%)
Nandrolone	1 (0.8%)
Oxandrolone	1 (0.8%)
Oxymetholone	1 (0.8%)
Sildenafil (Viagra)	1 (0.8%)
Steroid (unknown type)	6 (4.6%)
THC	1 (0.8%)
Testosterone caproate	1 (0.8%)
Testosterone enanthate	1 (0.8%)
Trenbolone	1 (0.8%)
Unknown Composition	**2 (1.5%)**
Unknown	2 (1.5%)

Table 36 (*Continued from previous page*). Active compounds detected in "other" samples checked in 2024, inclusive of all service locations.

Other categories: Cutting Agents

Compound	**Number of Samples** (% of all other samples)
Caffeine	10 (7.7%)
Carbohydrate (unknown type)	7 (5.4%)
Creatine	1 (0.8%)
Erythritol (sugar)	2 (1.5%)
Flour	1 (0.8%)
Lactose (sugar)	5 (3.8%)
Mannitol (sugar)	4 (3.1%)
Microcrystalline cellulose	38 (29.2%)
Mineral (unknown type)	3 (2.3%)
Oil (unknown type)	17 (13.1%)
Propylene Glycol	1 (0.8%)
Sodium bicarbonate (Baking soda)	2 (1.5%)
Starch	1 (0.8%)
Stearic acid	6 (4.6%)
Sucrose (sugar)	4 (3.1%)
Sugar (unknown type)	4 (3.1%)
Talc	2 (1.5%)
Water	3 (2.3%)
Xylitol (sugar)	1 (0.8%)

Table 37. Cutting agents detected in "other" samples across all service locations. *Quantitative concentrations are not available for these compounds.*

Other categories: Quantification

Little quantitative data is available for samples in the "other" category as none of the compounds expected "other" category are within the targeted method for PS-MS. Therefore, the compounds present in Table 38 below (except for benzocaine) are considered adulterants.

Compound	# Quant.	Median	Min	Max	IQR
Fentanyl	2		0.1%	4.6%	
MDA	1		4.6%		
Bromazolam	1		<0.1%		
Benzocaine	1		47.7%		

Table 38. PS-MS quantification of targeted active compounds detected in *expected* "other" samples, inclusive of all service locations.

Unknown samples

"Unknown" samples are those with an identity, or suspected identity, unknown to the service user (such as ground scores and unlabeled baggies). "Unknown" samples are the fourth most common "drug class" that we check, representing 7.3% of the total samples checked in 2023. Given that there is no "expected" active in "Unknown" samples, by default all are either classified as "unexpected", "inactive", or "unknown composition" depending on whether active drugs were detected, not detected, or if we were unable to determine what was present in the sample.

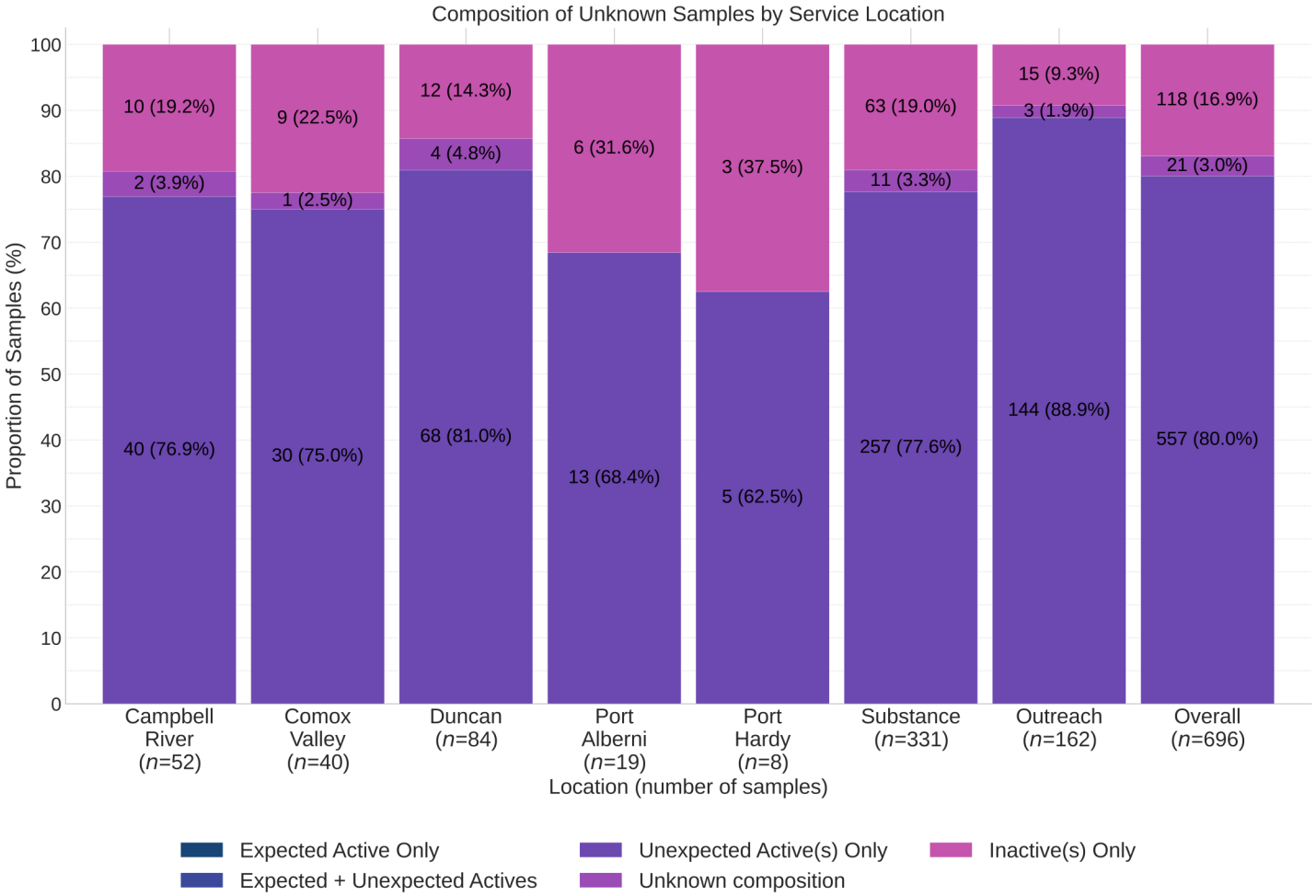


Figure 22. Proportion and number of expected unknown samples checked by service locations, grouped by composition class (see page 10 for definitions).

Unknown: What did we find?

Table 38 below aggregates all active compounds detected in unknown samples in 2023, across all service locations. The number of detections, and the prevalence with respect to all unknown samples checked, is listed. Samples with no detected actives have been excluded for brevity, however Table 40 on page 77 aggregates all cutting agents detected in unknown samples, across all service locations. See page 10 for definitions of the different composition classes.

Detected Compounds by Composition Class	**Number of Samples** (% of all unknown samples)
Unexpected Active(s) Only	**557 (80.0%)**
2C-B	6 (0.9%)
3-CMC (Clophedrone)	1 (0.1%)
3-MMC (Metaphedrone)	5 (0.7%)
3-MeO-PCE	1 (0.1%)
4-AcO-DMT (O-Acetylpsilocin)	1 (0.1%)
4-HO-MiPT (Miprocin)	1 (0.1%)
4-MMC (Mephedrone)	1 (0.1%)
5-MAPB	1 (0.1%)
5-MeO-DMT Base	1 (0.1%)
5-MeO-MiPT (Moxy)	2 (0.3%)
Acetaminophen (Paracetamol, Tylenol)	3 (0.4%)
Acetylcodeine	6 (0.9%)
Acetylmorphine (MAM, 6-MAM)	6 (0.9%)
Alprazolam (Xanax)	2 (0.3%)
Amphetamine	3 (0.4%)
Aspirin	2 (0.3%)
Benzocaine	1 (0.1%)
Benzodiazepine (unknown type)	28 (4.0%)
Bromazolam	97 (13.9%)
Buprenorphine	1 (0.1%)
Butyl Pentylone	1 (0.1%)
Cannabidiol (CBD)	1 (0.1%)
Carbamazepine	1 (0.1%)
Carfentanil	4 (0.6%)

Table 39 *(Continued on the next page)*. Active compounds detected in unknown samples checked in 2024, inclusive of all service locations.

Unknown: What did we find? *(Continued)*

Detected Compounds by Composition Class	**Number of Samples** (% of all unknown samples)
Unexpected Active(s) Only	**557 (80.0%)**
Citalopram	1 (0.1%)
Cocaine Base (crack, rock, hard)	39 (5.6%)
Cocaine HCl (powder)	67 (9.6%)
Codeine (T3's / T4's)	2 (0.3%)
Desalkylgidazepam	3 (0.4%)
Despropionyl para-fluorofentanyl	2 (0.3%)
Diazepam (Valium)	2 (0.3%)
Diclofenac (Voltaren)	2 (0.3%)
Ecgonine	1 (0.1%)
Etizolam	2 (0.3%)
Etodesnitazene	1 (0.1%)
FUB-AMB (AMB-FUBINACA, MMB-FUBINACA)	2 (0.3%)
Fentanyl	150 (21.6%)
Fentanyl analogue (unknown type)	8 (1.1%)
Fentanyl or analogue	17 (2.4%)
Flualprazolam	1 (0.1%)
Fluorexetamine (FXE)	1 (0.1%)
Fluorofentanyl	59 (8.5%)
Fluorofentanyl Base	12 (1.7%)
Fluoxetine	1 (0.1%)
GBL	1 (0.1%)
GHB	2 (0.3%)
Gabapentin	2 (0.3%)
Heroin	4 (0.6%)
Hydromorphone (Dilaudid, Dillies)	7 (1.0%)
Ibuprofen	2 (0.3%)
Ketamine	51 (7.3%)
Levamisole	4 (0.6%)

Table 39 *(Continued from previous page)*. Active compounds detected in unknown samples checked in 2024, inclusive of all service locations.

Unknown: What did we find? *(Continued)*

Detected Compounds by Composition Class	**Number of Samples** (% of all unknown samples)
Unexpected Active(s) Only	**557 (80.0%)**
Lidocaine	1 (0.1%)
Lorazepam (Ativan)	2 (0.3%)
MDA	15 (2.2%)
MDMA	61 (8.8%)
Medetomidine	1 (0.1%)
Melatonin	1 (0.1%)
Mescaline	2 (0.3%)
Metformin HCl	1 (0.1%)
Methamphetamine	52 (7.5%)
Methandrostenolone	2 (0.3%)
Methaqualone (Quaaludes)	1 (0.1%)
Modafinil	1 (0.1%)
Morphine	5 (0.7%)
Oxandrolone	2 (0.3%)
Oxycodone (Oxycontin)	6 (0.9%)
Phenacetin	8 (1.1%)
Quetiapine (Seroquel)	3 (0.4%)
Sildenafil (Viagra)	4 (0.6%)
Synthetic cannabinoid (unknown type)	1 (0.1%)
THC	1 (0.1%)
THCA	1 (0.1%)
Tadalafil (Cialis)	3 (0.4%)
Testosterone enanthate	1 (0.1%)
Trazodone	2 (0.3%)
Trenbolone	1 (0.1%)
Unknown	14 (2.0%)
Xylazine	12 (1.7%)
Zolpidem (Ambien)	2 (0.3%)

Table 39 *(Continued from previous page)*. Active compounds detected in unknown samples checked in 2024, inclusive of all service locations.

Unknown: What did we find? *(Continued)*

Detected Compounds by Composition Class	**Number of Samples** (% of all unknown samples)
Unexpected Active(s) Only	**557 (80.0%)**
Zopiclone	2 (0.3%)
ortho-Methyl fentanyl	29 (4.2%)
Unknown Composition	**21 (3.0%)**
Unknown	21 (3.0%)

Table 39 *(Continued from previous page)*. Active compounds detected in unknown samples checked in 2024, inclusive of all service locations.

Unknown: Cutting Agents

Compound	**Number of Samples** (% of all other samples)	**Compound**	**Number of Samples** (% of all other samples)
Caffeine	207 (29.7%)	Polyethylene glycol (PEG)	2 (0.3%)
Carbohydrate (unknown type)	24 (3.4%)	Propylene Glycol	4 (0.6%)
Citric acid	1 (0.1%)	Sodium bicarbonate (Baking soda)	8 (1.1%)
Corn starch	1 (0.1%)	Sodium carbonate	1 (0.1%)
Dicalcium phosphate	2 (0.3%)	Sorbitol (sugar)	2 (0.3%)
Dimethyl sulfone (MSM)	3 (0.4%)	Starch	5 (0.7%)
Erythritol (sugar)	97 (13.9%)	Stearic acid	6 (0.9%)
Flour	2 (0.3%)	Sucrose (sugar)	17 (2.4%)
Inositol (sugar)	3 (0.4%)	Sugar (unknown type)	17 (2.4%)
Lactose (sugar)	23 (3.3%)	Talc	8 (1.1%)
Lactose anhydrous	4 (0.6%)	Taurine	1 (0.1%)
Mannitol (sugar)	16 (2.3%)	Thiamine	1 (0.1%)
Microcrystalline cellulose	36 (5.2%)	Water	14 (2.0%)
Mineral (unknown type)	14 (2.0%)	Wax	1 (0.1%)
Oil (unknown type)	21 (3.0%)	Xylitol (sugar)	14 (2.0%)

Table 40. Cutting agents detected in unknown samples across all service locations. *Quantitative concentrations are not available for these compounds.*

Unknown samples: Quantification

Using PS-MS, we were able to quantify the concentration of select compounds detected in unknown samples. Not all samples can be analyzed via PS-MS, primarily due to samples that are too small to be accurately weighed, so the values listed in Table 40 below may not match those listed in Table 38. Table 40 aggregates the results from all unknown samples checked in 2024 across all service locations. Weight percentage is reported below. "IQR" is the interquartile range: the concentration range containing half of the quantified samples.

Compound	# Quant.	Median	Min	Max	IQR
Fentanyl	138	9.0%	<0.1%	>80.0%*	2.3% - 20.1%
Bromazolam	81	5.0%	<0.1%	>50.0%*	1.7% - 9.3%
Fluorofentanyl	55	4.4%	0.2%	>50.0%*	2.1% - 15.4%
MDMA	33	>50.0%*	1.3%	>80.0%*	29.6% - 50.0%
Methamphetamine	28	>50.0%*	<0.1%	>80.0%*	11.8% - 65.4%
ortho-Methyl fentanyl	24	5.4%	0.5%	18.2%	1.9% - 7.2%
Ketamine	19	>50.0%*	3.6%	>80.0%*	50.0% - 69.2%
Xylazine	11	0.2%	0.1%	30.9%	0.1% - 3.4%
MDA	10	29.3%	1.8%	>80.0%*	13.5% - 39.0%
Hydromorphone (Dilaudid, Dillies)	7	6.6%	2.9%	66.7%	4.1% - 7.5%
Acetylmorphine (MAM, 6-MAM)	6	2.7%	0.4%	6.9%	1.4% - 3.9%
Oxycodone (Oxycontin)	6	38.0%	5.6%	>50.0%*	14.1% - 42.2%
Phenacetin	6	23.0%	3.3%	>50.0%*	5.7% - 42.9%
Fluorofentanyl Base	6	28.1%	8.1%	43.3%	19.1% - 36.3%
Acetylcodeine	6	0.3%	0.1%	10.9%	0.2% - 0.7%
Morphine	5	9.1%	3.6%	26.5%	7.6% - 12.1%
Levamisole	4	2.0%	0.4%	3.6%	0.7% - 3.4%
Heroin	4	10.3%	4.5%	>80.0%*	4.7% - 31.9%
Carfentanil	4	0.6%	0.2%	0.7%	0.5% - 0.7%
Desalkylgidazepam	3	9.0%	5.6%	>50.0%*	7.3% - 29.5%
Amphetamine	3	11.0%	10.6%	19.4%	10.8% - 15.2%
2C-B	3	>50.0%*	3.5%	>50.0%*	26.7% - 50.0%
Etizolam	2		0.5%	0.7%	
Diazepam (Valium)	2		0.3%	3.4%	

Table 41 *(Continued on the next page)*. PS-MS quantification of targeted active compounds detected in *expected* unknown samples, inclusive of all service locations.

Unknown samples: Quantification *(Continued)*

Compound	# Quant.	Median	Min	Max	IQR
Zolpidem (Ambien)	2		2.1%	5.0%	
Alprazolam (Xanax)	2		0.9%	1.2%	
Lorazepam (Ativan)	2		2.1%	7.2%	
Buprenorphine	1		3.9%		
4-AcO-DMT (O-Acetylpsilocin)	1		>80.0%*		
Medetomidine	1		0.5%		
Lidocaine	1		62.3%		
Butyl Pentylone	1		>80.0%*		
Ecgonine	1		2.4%		
Gabapentin	1		>50.0%*		
Zopiclone	1		<0.1%		
Flualprazolam	1		0.9%		
Codeine (T3's / T4's)	1		1.0%		
Etodesnitazene	1		>25.0%*		
Fluorexetamine (FXE)	1		<0.1%		

Table 41 *(Continued from previous page)*. PS-MS quantification of targeted active compounds detected in *expected* unknown samples, inclusive of all service locations.

Opioid–Positivity in Non-Opioid–Down Samples

In 2024, we checked 4697 samples across all service locations that were not expected to contain fentanyl or other unexpected opioids. Since the opioid–down supply is no longer "just heroin" or "just fentanyl" and is instead a complex, potent, and ever-changing polysubstance market containing other opioids like ortho-Methyl fentanyl and nitazenes, here we will examine the prevalence of any unexpected opioid, not just fentanyl, detected in non-opioid–down samples. In the case of "opioid-other" samples, "unexpected opioids" are defined as any other opioid detected that is not the expected opioid (e.g. fentanyl in an expected oxycodone pill). Unknown samples have been excluded from these data and "Other categories" is comprised of the following drug classes: precursors, cutting agents, steroids, other, depressants - other, stimulants - other.

These data are split into two categories in Table 40 below: samples in each drug class where unexpected opioids were detected (Total Opioid Positive) vs. samples where unexpected opioids were detected alongside the expected drug (Number of Samples Containing Expected Active & Opioid-Positive). The intention of this split is to examine opioid misrepresentation vs. the co-prevalence of opioids with non-opioids. Examining Table 40, we find that unexpected opioids were detected in 3.2% (versus 1.8% in 2023) of all non-opioid–down samples. However, if we are interested in the co-prevalence of opioids and non-opioid samples, we see that 1.5% of the samples that were confirmed to contain the expected substance also contained an unexpected opioid.

As a guiding example from these data, 7.5% (27/359) of expected benzodiazepine samples were found to contain unexpected opioids. However, not all benzo samples are "as expected" and only 31.5% (113/359) of benzo samples actually contained the expected benzo. Of these 113 samples, 11 samples were found to contain opioids as well (8.6% of benzo samples that contained the expected benzo). Samples in the opioid-other, benzodiazepine, and methamphetamine classes showed the highest total prevalence of unexpected opioids.

Expected Substance Class	**Total Samples**	**Total Opioid Positive** (% of Total Expected)	**Number of Samples Containing Expected Active** (% of Total Samples in Class)	**Number of Samples Containing Expected Active & Opioid-Positive** (% of Samples Containing Expected Active)
Cocaine	1325	38 (2.9%)	1281 (96.7%)	27 (2.1%)
MDMA	1051	4 (0.4%)	995 (94.7%)	0 (0.0%)
Dissociatives	622	4 (0.6%)	580 (93.2%)	0 (0.0%)
Other	391	4 (1.0%)	250 (63.9%)	3 (1.2%)
Psychedelics	389	1 (0.3%)	301 (77.4%)	0 (0.0%)
Benzodiazepines	359	27 (7.5%)	128 (35.7%)	11 (8.6%)
Methamphetamine	309	23 (7.4%)	285 (92.2%)	18 (6.3%)
Opioid - Other	251	47 (18.7%)	162 (64.5%)	1 (0.6%)
Total	4697	149 (3.2%)	3982 (84.8%)	61 (1.5%)

Table 42. Overview of the prevalence of unexpected opioids found within non-opioid–down samples in 2024, inclusive of all service locations.

Opioid–Positivity in Non-Opioid–Down Samples *(Continued)*

Opioid–Positivity in "Opioid - Other" Samples

18.7% (47/251) of expected "opioid - other" samples contained an unexpected opioid. 20 were expected to be oxycodone, 17 were expected to be hydromorphone, 9 were expected to be Percocet, and 1 was expected to be methadone. The composition of the 47 expected "opioid - other" samples which contained an unexpected opioid are shown below in Table 42.

Expected Active Compound	Unexpected/Additional Opioid(s) Detected	Number of Samples
Oxycodone (Oxycontin)	Isotonitazene	5
	Metonitazene	5
	Metonitazene, N-desethyl isotonitazene	3
	N-desethyl isotonitazene	3
	Fentanyl	1
	Fentanyl or analogue	1
	Fentanyl, Fluorofentanyl	1
	N-Pyrrolidino Etonitazene	1
Hydromorphone (Dilaudid)	Isotonitazene	7
	Metonitazene	3
	N-Propionyl Para-Fluoro Norfentanyl Base	2
	N-desethyl isotonitazene	2
	Fentanyl analogue (unknown type)	1
	Fentanyl or analogue	1
	Fentanyl, Fluorofentanyl Base	1
Percocet	Fentanyl analogue (unknown type)	2
	Fentanyl or analogue	2
	Metonitazene	2
	Fentanyl	1
	Fentanyl, Fluorofentanyl	1
	Isotonitazene	1
Methadone	Fluorofentanyl Base	1

Table 43. Expected "Opioid - Other" samples checked in 2023 containing an unexpected opioid, inclusive of all service locations. Only unexpected opioids are shown, other compounds may be present in these samples.

Opioid–Positivity in Benzodiazepine Samples

7.5% (27/359) of expected benzodiazepine samples contained an unexpected opioid. 15 had an unspecified expected compound and 12 were expected to be bromazolam. The composition of the 27 expected benzodiazepine samples which contained an unexpected opioid are shown below in Table 43.

Expected Active Compound	Unexpected/Additional Opioid(s) Detected	Number of Samples
Unspecified / Other	Fentanyl	11
	Fentanyl or analogue	2
	Fentanyl Base, Fluorofentanyl	1
	Fentanyl or analogue	1
Bromazolam	Fluorofentanyl	4
	Fentanyl, Fluorofentanyl	3
	Fentanyl, Fluorofentanyl, ortho-Methyl fentanyl	2
	Fentanyl, Methamphetamine	1
	Metonitazene	1
	ortho-Methyl fentanyl	1

Table 44. Expected Benzodiazepine samples checked in 2024 containing an unexpected opioids, inclusive of all service locations. Only unexpected opioids are shown, other compounds may be present in these samples.

"Fentanyl or analogue" results are based on a positive strip test and are unconfirmed by paper spray.

Opioid–Positivity in Methamphetamine Samples

Unexpected opioids were found in 7.4% (23/309) of expected methamphetamine samples. Among these, 18 samples also contained methamphetamine. In 8 of the 18 samples containing methamphetamine, the presence of an unexpected opioid (most often fentanyl or an analogue) was likely due to cross-contamination. In 6 of the 23 samples, a benzodiazepine was also present, most often bromazolam (4 samples), followed by an unknow benzo (2 samples).

Opioid–Positivity in Cocaine Samples

2.9% (38/1325) of expected cocaine samples were found to contain an unexpected opioid. In all 38 cases, the unexpected opioid was fentanyl or a fentanyl analogue. Among the samples with an unexpected opioid, 71.0% (27/38) also contained the expected active component (cocaine or crack). In 16 of these 27 samples, the presence of fentanyl or a fentanyl analogue was likely due to cross-contamination rather than intentional adulteration with fentanyl. 11 of the remaining 22 samples were consistent with down samples, containing fentanyl or a fentanyl analogue, often cut with caffeine and/or sugar. Among the samples consistent with down samples, 3 contained benzodiazepines.

Opioid–Positivity in MDMA Samples

Out of 1051 MDMA samples, four were found to contain an unexpected opioid, none contained the expected active. Three of the four expected MDMA samples which contained an unexpected opioid were consistent with down samples, containing fentanyl or a fentanyl analogue cut with caffeine and/or a sugar. Of the samples consistent with down, two contained a benzodiazepine. The remaining sample contained methamphetamine and tested positive for fentanyl via a strip test

Opioid–Positivity in Non-Opioid–Down Samples *(Continued)*

Opioid–Positivity in Dissociatives Samples

Four out of 622 dissociative samples also contained an unexpected opioid. Of these four samples, three were expected to be ketamine and one was expected to contain PCP, however, none contained the expected active. Two of the expected ketamine samples contained cocaine base, fluorofentanyl base, and phenacetin. The remaining expected ketamine sample contained fluorofentanyl base and an unknown. Lastly, the expected PCP sample contained heroin and the related alkaloids acetylcodeine and acetylmorphine, in additional to fentanyl or an analogue.

Opioid–Positivity in Psychedelic Samples

The single opioid positive psychedelic sample was expected to be DMT, however, it contained fentanyl and bromazolam instead.

Opioid–Positivity in Other Categories

The four samples which fall into “other” categories (i.e., precursors, cutting agents, steroids, other, depressants - other, stimulants - other) that contained an unexpected opioid were expected to be THC, benzocaine, caffeine, and “Fentora” respectively. In the case of the expected THC and benzocaine samples, fentanyl or an analogue was only detected via strip test, pointing towards these samples being cross-contaminated with fentanyl or analogue prior to drug checking. The caffeine sample contained trace amounts (0.1%) of fentanyl detected via PS-MS, which due to the low concentration of fentanyl in this sample also points towards cross-contamination. Lastly, the “Fentora” sample, otherwise known as fentanyl citrate. Fentora is one name brand for pharmaceutical fentanyl. This sample contained fentanyl and bromazolam.

Benzodiazepine (unknown type) results are based on a positive strip test and are unconfirmed by paper spray.

2024 Publications

In 2024 we published three research articles in three different journals. Two additional publications are under review. A full list of our publications in available on our website.

Evaluation of a Drug Checking Training Program for Frontline Harm Reduction Workers and Implications for Practice

Journal of Public Health Management and Practice Volume 31 doi.org/10.1097/PHH.0000000000002041

Trace Detection of Adulterants in Illicit Opioid Samples Using Surface-Enhanced Raman Scattering and Random Forest Classification

Rebecca Martens, Lea Gozdzialski, Ella Newman, Chris Gill, Bruce Wallace, and Dennis Hore

Analytical Chemistry Volume 96 Issue 30 doi.org/10.1021/acs.analchem.4c01271

Beyond a spec: assessing heterogeneity in the unregulated opioid supply.

Lea Gozdzialski, Rebecca Louw, Collin Kielty, Ava Margolese, Eric Poarch, Miriam Sherman, Fred Cameron, Chris Gill, Bruce Wallace and Dennis Hore

Harm Reduction Journal Volume 21 doi.org/10.1186/s12954-024-00980-5

Substance Drug Checking

Annual Review 2024

Where to Find Us

Campbell River
Vancouver Island Mental Health Society Overdose Prevention Site
1330 Dogwood St, Unit #5, Campbell River, BC
(250) 287 - 9969

Campbell River AVI
AVI Health & Community Services
1371 Cedar Street, Campbell River
(250) 830-0787

Comox Valley
AVI Health & Community Services
355 6th St, Courtenay, BC
(250) 338 - 7400

Duncan
Duncan Lookout Society Overdose Prevention Site
Cowichan Valley Wellness and Recovery Center
5878 York Road, Duncan, BC
(250) 597 - 7779

Port Alberni
Port Alberni Shelter Society Overdose Prevention Site
3699 3rd Ave, Port Alberni, BC
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Port Hardy
Island Health Mental Health and Substance Use
7070 Shorncliffe Ave, Port Hardy, BC

Victoria
Substance Drug Checking
1802 Cook Street, Victoria, BC
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Substance Drug Checking

Annual Review 2024

Substance Drug Checking is based out of the University of Victoria and operates community-wide drug checking services within Campbell River, the Comox Valley, Duncan, Port Alberni, Port Hardy, and Victoria, BC. We are continuing to offer drug checking services in response to the toxic drug public health emergency, and exploring new ways to better reach those who may benefit from this service. We have partnered with Dr. Chris Gill and the team at Vancouver Island University to improve detection and reporting using their methods for the paper spray - mass spectrometer.

See the blog portion of our website to view our more detailed interpretations of our reports.

Our project works on Indigenous land. We provide drug checking, harm reduction education and support across many territories on what is colonially known as 'Vancouver Island.' We also act as a resource for these services across the province colonially known as 'British Columbia.' We honour and offer respect to many nations for their stewardship, care and leadership on these lands.

Our project originated on the territories of the lək̓ʷəŋən speaking peoples, including the Songhees and Xwsepsum (Esquimalt) Nations, and the W̱SÁNEĆ (Saanich) Nations on whose land the University of Victoria is located. Some of the territories we are honoured to work across specifically include: Halalt, Lyackson, Meluxulh (Malahat), Puneluxutth', Quw'utsun, Stz-uminus, and Ts'uubaa-asatx; Hupačasath and Tseshaht; K'ómoks; and Laich-kwil-tach.

We acknowledge the inextricable links between research, colonization and racism against Indigenous peoples, which continue to this date. Ending the violence faced by people who use drugs cannot be achieved without actively working on decolonization.

For more information please visit: substance.uvic.ca or email: substance@uvic.ca

We gratefully acknowledge our partners on this project

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BC Ministry of Health
BC Ministry of Mental Health and Addictions
BC SUPPORT Unit Vancouver Island Centre
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Canadian Institute for Substance Use Research
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Island Health Authority
NSERC Canada
SOLID Outreach
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